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The Origins of the Platonic Approach to Monetary Systems: Retracing European and Chinese Monetary Thoughts on Chartalism, Nominalism, and the Origins of Monetary Systems

by

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ABSTRACT: A monetary approach that combines Chartalism, Nominalism, and Command origins of monetary systems is often deemed to have emerged only recently, while the Aristotelian approach (Commodity, Metallism, and Market origins of monetary systems) is the only one that existed until the end of the eighteenth/early-nineteenth century. In the major studies of the history of monetary thought, the Chartalism-Nominalism-Command approach is mostly left unmentioned, or at best reduced to an incoherent banality. The paper shows that this approach has a long and rich intellectual history among European monetary thinkers. In Europe, Plato was its first exponent, albeit in a very rudimentary way, and so one may call it the "Platonic approach." It is developed by Roman legists (such as Javolenus, Paulus, and Ulpian) and Medieval legists (such as Du Moulin, Hotman, and Butigella) who note that coins are similar to securities and that debts are serviced when nominal sums are paid rather than specific coins tendered. During the Renaissance and early modern period, a series of scholars and financial practitioners (such as Law, Dutot, Thomas Smith, and James Taylor) emphasize the financial logic behind monetary mechanics and the similarity of coins and notes. In the twentieth century, authors such as Innes, Knapp, Keynes, and Commons build onto the groundwork provided by these past scholars. In China, the Chartalism-Nominalism-Command approach develops independently and dominates from the beginning under Confucian and Legist thoughts. They emphasize the statecraft origins of monetary systems, the role of tax redemption, and the irrelevance of the material used to make monetary instruments. Clay, lead, paper, iron, copper, and tin are normal and convenient means to make monetary instruments, they are not special/emergency materials. The essence of a monetary instrument is not defined by its materiality but rather by its chartality, that is, by the promise it embeds. The Platonic approach rejects the categories and conceptualizations used by the Aristotelian approach and develops new ones, which leads to a different set of inquiries and understanding of monetary phenomena, problems, and history.

KEYWORDS: History of monetary thoughts, monetary theory, Chartalism, Nominalism, asset pricing, redemption

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> I know that there are some who say that the value of money is purely arbitrary and not otherwise intrinsic. This opinion, although manifestly false and dangerous, has nevertheless been followed for a long time, not only by the unlearned multitude, but also by some Sages. Aristotle has been ignorantly cited, as if he had approved it in the first book of *Politics*, but it is certain that some Stoics held this sentiment. And because the majority of the Roman Jurisconsults were of this sect, such a damning opinion passed into the body of civil laws and into almost all the Jurisconsults. (Antonio Genovesi in *Lezioni di Commercio*)[1]

INTRODUCTION[2]

Aristotle is at the source of a monetary approach that is commonly used in many disciplines of academia. Studies of the intellectual history of this approach are numerous and comprehensive. All the major works on the history of European monetary thought, such as Schumpeter (1929, 1954), Rist (1940), and Monroe (1923) focus on that approach to monetary theory. This approach had major influences on the management of monetary systems and continues to dictate the way monetary history and theory have been taught and practiced in Western academia.

The overwhelming influence of this Aristotelian approach on contemporary Western monetary thought is puzzling—as Cesarano (2014) notes—given that a coherent alternative can be traced back to the work of Plato (Von Glahn 1996; Monroe 1923). This alternative monetary approach is also present very early in non-European monetary thoughts. For example, the monetary thought and praxis of Chinese thinkers along this alternative is, at times, hundreds of centuries

[1] « So bene, che v' ha di taluni, i quali dicono, che il valore della moneta è puramente arbitrario, e non altrimenti intrinseco. Questa opinione, benchè manifestamente falsa, e pericolosa è stata nondimeno lungo tempo seguitata non solo dalla non dotta moltitudine, ma da alcuni Savi altresì. Si è ignorantemente citato Aristotile, come se nel 1. libro della Politica l'avesse approvata (b), Ma è certo che di tal sentimento sono stati alcuni Stoici. E perchè la maggior parte de' Giureconsulti Romani furono di questa Setta; una si dannevole opinione trapassò nel corpo delle leggi civili, e quasi in tutti i Giureconsulti. » (Genovesi 1769, 27–8)

[2] Except for French, all translations relied initially on Google Translate. The syntax and words were changed to correct obvious mistakes or to adapt them to modern English without changing the meaning of the original text. The original text is shown in the footnotes.

ahead of Europeans (Thierry 2017; Xinwei 1965). In Europe, major developments were provided by Roman legists, medieval legists, and financiers and economists of the Renaissance and early modern period. Unfortunately, most of these scholars are at best mentioned briefly and often dismissively in the history of monetary thought, because such history has been written mostly by proponents of the Aristotelian approach. When mentioned, the Platonic approach has been characterized as a legal (rather than an economic) approach to monetary analysis (Mises 1912; Monroe 1923), an "economic [and judicial] error" (Thomas 1899, 58, n.1), "freakish" (Schumpeter 1954, 294), or even downright "manifestly false and dangerous" (Genovesi 1769, 27). While works such as Gonnard (1935), Harsin (1928), Vickers (1959), and Mints (1945) do provide a slightly broader overview, many European contributors to the Platonic approach are unknown and a coherent narrative that links their work together and shows how the approach progressed and erred is missing. A compelling narrative of the historical development of the Platonic approach—its core principles, the logic of its arguments, the debates and errancies it generated, its insights, its influence—has yet to be written. Such a narrative is all the more necessary that, over the past three decades, there has been a renewal of interest in the work of Georg Friedrich Knapp and Alfred Mitchell Innes (Bell 2003; Wray 2004). The state and credit theories of money are similar; basic concepts of finance clearly convey the identical internal logic of both (Tymoigne 2014). The progressive recognition and understanding of these financial concepts are at the core of the study of the intellectual development of the Platonic approach.

The paper provides the first sketch of the intellectual history of the platonic approach to monetary analysis. The first part of the paper briefly reviews the two alternative approaches to monetary analysis. The second part presents some of the key developments that have led to the modern expression of the Platonic approach: the rise of Nominalism, the struggle over the concept of chartality and nature of monetary instruments, the differentiation between commodities and monetary instruments, the discovery and implementation of several redemption channels, the differentiation of the unit of account from monetary instruments, the debate about the origins of monetary systems, and the implications for the management of monetary systems. As one may expect, progress was slow and European scholars did not completely break from the Aristotelian approach, they chipped at it while mixing elements of both approaches. One has to wait for the nineteenth century for a complete break from the Aristotelian approach in Europe. In

the third part, Chinese monetary thought is briefly reviewed, the Chartalism-Nominalism-Command approach dominates from the inception of Chinese monetary studies and remains common over the following millennia.

1. EUROPEAN MONETARY THOUGHTS: TWO APPROACHES

1.1. The Aristotelian Approach

The "classical theory of money" (Hawtrey 1919, 1, 17–18) includes the following core components. First, the purchasing power of unit of account is determined by the relative price of the standard metal when the metal is transacted for non-monetary uses. Second, the money supply is a multiple of the stock of metal available. Third, the inconvenience of barter led to the selection of a commodity as a medium of exchange. Fourth, debts, rents and other contracts are fulfilled when a given weight of metal is tendered to creditors. Fifth, free coinage of the standard coins should be allowed. Sixth, the nature of monetary instruments is defined in functional terms "money is that money does" (Walker 1878, 405),[3] but authors have disagreed on which function is most important: medium of exchange, store of value, means of payment, or unit of account. For example, Rist (1940 [1966], 58) concludes that "money is […] the durable and indestructible good, of stable value and unlimited acceptability" that serves as final means of payment and store of value, while Mises (1912 [1953], 61) emphasizes commodities used as a medium of exchange "by usage of those who take part in commercial transactions." Regardless of the function chosen, monetary instruments are conceptualized as commodities. In Europe, this approach to monetary analysis can be traced back in rudimentary form to Aristotle, especially Book I of *Politics*, where he emphasizes the needs of international trade, followed by retail trade, as the origins of monetary systems, and the needs for coins to be made of a material "useful and easily applicable to the purposes of life, for example, iron, silver, and the like" (Aristotle 33? BC

[3] Hill (1856, 105) also uses a functional approach: "It has been objected, that bills of exchange cannot be regarded as currency because they are not cash, but merely promises to pay cash. To this it may be answered, that upon the same plea, bank-notes are not currency, because they are likewise but mere promises to pay cash. The question, however, so far as the present inquiry is concerned, is not what bills of exchange are, but what they do."

(1999), 14ff.), and Book V of *Nicomachean Ethics*, where he notes that the law created monetary systems[4] to facilitate trade and to carry purchasing power through time[5] (Aristotle 340BC, 79ff.).

A first component of the Aristotelian monetary approach is the commodity theory. Given that monetary instruments are commodities, their valuation is backward-looking, the price at which they circulate is defined by a cost-plus-markup pricing method:

$$P = OV = IV + \lambda$$

with P, the market price of the monetary instrument, OV, the official value set by the issuer, IV the intrinsic value of the material used to make a monetary instrument, and λ, a markup that may include the minting cost (brassage fee) and a seigniorage fee. The standard historical examples are coins made of copper, silver, or gold. The Aristotelian approach can accommodate for "token" or "fiduciary" coins (defined in this approach as coins, usually made of a base metal, of low intrinsic value relative to the official value) and inconvertible paper money for which the market price is driven mostly by the markup. Assuming for simplicity that the intrinsic value is zero, we have:

$$P = OV = \lambda$$

In this case, the valuation is based on "convention" or "fiat," but this is a "pathological case that requires special treatment" (Rist 1940 [1966], 325), an "abnormal phenomenon" (Jevons 1875, 121), and "generally speaking, such a thing cannot become money" (Galiani 1751 [1977], 55), except during emergency situations, and they cannot circulate abroad. Sargent and Velde (2003, 107ff.) provide an overview of the integration of fiat monetary instruments from the viewpoint of Aristotelian thinking; conversion into the standard coin is a necessary means to make token coins

[4] "and this is why it has the name 'money' (*nomisma*)—because it exists not by nature but by law (*nomos*) and it is in our power to change it and make it useless."

[5] "And for the future exchange […] money is as it were our surety; for it must be possible for us to get what we want by bringing the money. Now the same thing happens to money itself as to goods—it is not always worth the same; yet it tends to be steadier." (Aristotle 340BC (1999), 80).

viable. For something to be universally accepted, it must be made of a durable material that has a relevant intrinsic value that is easily assessable and not easily counterfeited (Galiani 1751 [1977], 54). Given such conception of monetary instruments, the notion of redemption is generally absent from the analysis of the coinage or is conceived narrowly as conversion into the standard coin. The only "real money" is the standard coin while other monetary instruments are just "credit," i.e., promises to convert into the standard coin, or "fiat," i.e., instruments that circulate at an arbitrary price imposed by the issuer (Mises 1912). The standard coin contains no promise; it is a real asset, a commodity, with a nominal value that is dictated by "market forces" that are supposed to be non-arbitrary.

One of the main debates among scholars of the 12th to 14th centuries concerns the size of the markup the king, feudal lords, and other coin issuers could impose. There was an overall agreement that the minting right was a privilege of the sovereign that he could sell or grant to others if he wished; this is reflected in the fact that most coins were not royal coins in medieval times (Babelon 1909; Gonnard 1935; Ernst 2016). The debate involves the Canonists, the Romanists,[6] as well as Aristotelian theologians and philosophers who ponder how to allocate the cost of minting (general taxation of the population or a brassage fee on metal suppliers) and the size of the seigniorage. Romanists (such as Bartole) wanted the official value of the coinage to be equal to the intrinsic value, the cost of production ought to be shared by the entire population and the seigniorage fee ought to be zero.[7] Canonists (under the leadership of Pope Innocent IV) commanded European sovereigns to include the cost of production in the official value and exceptionally seigniorage in cases of emergency (e.g., war, ransom) or if the metal price fluctuates (so that the markup provides a buffer against a rise in the intrinsic value and so limits the risk of melting and/or exporting of coins). Aristotelians (e.g., Aquinas, Buridan) wanted the brassage fee to be included in the markup. Overall, the sovereign, feudal seigneurs, and other

[6] Canonists and Romanists are legists who, respectively, developed the laws governing the Catholic church, and commented on the laws of the Roman Empire to develop civil law (Romanists are also called Glossators and post-Glossators, "gloss" means "comment")

[7] "There was a general mistrust of coins functioning as money proper, that is to say, of their circulating by tale as units for payment. Rather, coins were commodified, and defined as publicly certified pieces of silver. Since coins were valued according to their inherent metal value, they could not, the glossators held, be given a nominal value exceeding their metal value." (Ernst 2016, 115).

entities that officially or unofficially issued coins ought to follow closely, if not perfectly, the monetary value of the metal content when they set the official value of their coinage. As such, Ferdinando Galiani (1728–87) and William Stanley Jevons (1835–1882) much later concluded:

> money is not valued according to its total weight, but according to how much good metal it contains. […] Thus, it is the law which makes money bad, not the alloy it contains. Those who would wish to see that a state has only good coins would not set a value on any, or assign prices to them. […] after [a coin leaves the mint,] it would not be necessary to constrain anyone to remain at the [Mint] price but, rather, to allow the coin to be treated like merchandise. Whenever the common consensus differs from the mint price, the mint price should be made to conform to that of the populace, which when left free always follows the truth. (Galiani 1751 [1977], 127, 141)

> The stamp is a mere certificate of weight and fineness to avoid weighing and assaying coins in transactions among bearers: "*coins are ingots of which the weight and fineness are certified by the integrity of designs impressed upon the surfaces of the metal*." (Jevons 1875, 57)

A related debate among feudal thinkers concerns the ability of the sovereign to manipulate the intrinsic value and seigniorage. Canonists, Romanists, and Aristotelians put moral, legal, or popular restrictions to limit the temptation of the sovereign and feudal seigneurs to frequently mutate the coinage (Babelon 1909, 315ff.). Nicole Oresme (1325–82) and Gabriel Biel (1425–95) adapt the Canonist position, developed for feudal estates, to the case of monarchies by stating that such manipulations must be announced, infrequent and get the consent of the population, otherwise the coinage is false. Non-consensual mutations are still allowed in case of lack, or abundance, of metals and for profit and public purposes (Babelon 1909, 316, 346; Harsin 1928, 8). Coins, like any other commodities, are properties but they are properties of the nation, even if the minting right belongs to the king. Oresme's and Biel's position can be traced back to Aristotle and followed a long lineage of scholars that include Aquinas, Buridan, and Menger (Monroe 1923, 82–3).

A second core aspect of the Aristotelian approach is the Metallist principle, or Metallism; debt contracts implicitly or explicitly involve a transfer of a certain quantity of precious metal between creditors and debtors:

> For Money having been Lent, and Leases and other Bargains made, when Money was of the same Weight and Fineness that it is now, upon Confidence that under the same names of *Pounds*, *Shill*. and *Pence*, they should receive the same value, (i.e. the same quantity of Silver) […]. When men go to Market to buy any other Commodities with their new, but lighter Money, they will find 20 *s*. of their new Money will buy no more of any Commodity than 19 would before. For it not being the denomination but the quantity of Silver, that gives the value to any Coin, 19 Grains or parts of Silver, however denominated or marked, will no more be worth, or pass for, or buy so much of any other Commodity as 20 Grains of Silver will, than 19 *s*. will pass for 20 *s*. (Locke 1692, 142)

> Since money intervenes in all contracts, it is most necessary that it be made of a substance that is easy to evaluate. [As such] […], it will be seen how necessary it is for real money to be measured by weight. (Galiani, 1751 [1977], 57, 59)

Even if Metallist principles are not present in the law, it is as if they are because individuals are argued to think in Metallist terms so contracts and prices adjust to mutations to keep the quantity of metal constant:

> It will possibly be here objected to me, that we see 100 *l.* of *clipt Money,* above 5 *per Cent* lighter than the Standard, will buy as much Corn, Cloth, or Wine, as 100 *l.* in *mill'd Money,* which is 1/20 heavier; whereby it is evident that my Rule fails, That it is not the quantity of Silver that gives the Value to Money, but its Stamp and Denomination. To which I answer, That *Men make their Estimate and Contracts according to the Standard,* upon Supposition they shall receive good and lawful Money; which is that of full Weight; and so in effect they do, whil'st they receive the current Money of the Country. […] If the *quantity of your clipt Money* be once grown so great, that the foreign Merchant cannot (if he has a mind to it) easily get *Weighty* Money for it, but having sold his Merchandise,

> and received *Clip'd* Money, finds a difficulty to procure what is weight for it; he will, in selling his Goods, either contract to be paid in *weighty* Money, or else raise a [sic] the Price of his Commodities, according to the diminish'd quantities of Silver in your Current Coin. (Locke 1692, 154–6)

Debt contracts require the repayment of a certain quantity of precious metal, they are denominated "in silver," "in gold," or "in coins." As such, the debtor must either repay with the same coins he borrowed or, if debasement or enhancement occurred during the course of the contract, he must provide more light coins (and so a higher nominal sum) to reach the same weight of precious metal. A loan contract is understood analytically as a transfer of real resources over time, with precious metals argued to be stable physical representation of that transfer of purchasing power, or, if not stable, at least "steadier" (Aristotle 340BC [1999], 80) than other commodities (Rist 1940, 353, 372, 374). As such, economic calculations are made in terms of pounds of metal and the relative price of precious metals determines if a debtor prefers to pay his creditor in pounds of gold or pounds of silver (Galiani 1751 [1977], 137). The same applies to economic transactions in general, everything is measured in terms of a weight of precious metals and the official value of coins is irrelevant:

> By the money-price of goods, […] I understand always the quantity of pure gold or silver for which they are sold, without any regard to the denomination of the coin. (Smith 1776 [1991], 41)

Manifestly, this classical version of the Aristotelian approach is no longer relevant given that precious metals are no longer part of monetary systems. However, this can be accommodated by arguing that precious metals are a source of stable purchasing power, and economic units make economic decisions and write contracts that adjust for gains and losses of purchasing power. As such, one can conceptualize the monetary system as if a commodity of stable purchasing power is used as a monetary instrument and monetary debts involve the intertemporal transfer of goods and services. The legal version of this economic position is called Valorism; monetary instruments and debts are claims on commodities. Creditors are owed the right to a given quantity of commodities, so the debt service must be adjusted to keep the purchasing power of

the debt service constant.[8] This modern version of the Aristotelian approach is quite pervasive today in economics—what Keynes calls the Real Exchange Economy—and provides the foundation for the standard understanding of financial crises in which monetary instruments may grow on trees and Nature randomly sends large adverse shocks that wreak havoc through the economic system (e.g., Kiyotaki and Moore 1997).

Third, consistent with Metallism, the unit of account ("ideal money") may differ from coins ("real money") but the unit of account finds its root in commodities or "the oldest coins […] [that] were all real at one time" (Galiani 1751, 73). It is the standard coin that defines the unit as a weight of precious metal, not the unit that defines the standard coin as a number of monetary units, because ultimately all payments involve the transfer of a weight of precious metal not the transfer of mere abstract digits. There may be cases of "imaginary money" that is "money which does not correspond exactly to any piece of metal to which it is equivalent in value" (Galiani 1751 [1977], 73); however, this does not mean that there is no tie to a quantity of metal. "Imaginary" units of account were used by international merchants and bankers to protect themselves against the metallic unreliability of current coins because of mutations, natural wear and/or artificial wear such as clipping (Roberds and Velde 2016a). Einaudi developed Galiani's difference between "imaginary" and "real money" and links token coins to "imaginary money" while "money as a commodity (metal)"—i.e., full-bodied coins—is called "real money." As such, "money is a negotiable commodity like any other" (Einaudi 1936 [2006], 177).

Fourth, such an approach has important implications for monetary management. In order for such a monetary arrangement to work, people should be free to bring to the Mint the required material to make coins, or to melt coins when it is profitable to do so. The Mint should set a Mint price and a Mint equivalent, both in absolute and relative terms (if multiple denominations and/or multiple metals are used) in a way that manages the inflows of metal(s) and the melting and exporting of the domestic coinage. This is part of a broader monetary policy based on the Cipolla's standard formula: free coinage of standard coins, king's monopoly over token coins, and conversion of token coins into the standard coins at a fixed exchange rate (Velde 1998;

[8] Note that this is different from the Metallist position that argues that debt services must keep the quantity of metal constant. A given quantity of metal does not have a stable purchasing power.

Sargent and Velde 2003). In modern times, the Aristotelian approach also provided the intellectual foundation for the creation of the Eurozone (Goodhart 1998).

Overall, the Aristotelian approach emphasizes the distinctions between "commodity money," "credit money," and "fiat money," or alternatively the distinction between "fiduciary/token money" and "real/commodity money." It focuses on the functions performed by objects to determine if a monetary system is present; which function matters most depends on the time, place, and choice of the inquirer. There is no intrinsic difference between commodities and monetary instruments and a unit of account is just one among many possible relevant functions to study. This leads an inquirer to study the relevance or not of trust in the circulation of monetary instruments, the size of the seignoriage, and its impacts on monetary dynamics, and to emphasize issues surrounding the level of, and change in, purchasing power.

1.2 The Platonic Approach

The Platonic approach has the following core components. First, the purchasing power of the unit of account is undefined and uncertain. Second the money supply is highly elastic and not confined to, or limited by, the supply of a metallic coin. Third, monetary systems (as well as markets) were created from the ground up by authorities to command the economy. Fourth, it follows a Nominalist understanding of contracts and dues. Fifth, the nature of monetary instruments is defined in financial terms, a redeemable financial instrument with characteristics that promote a stable nominal value, but authors have debated on which channel of redemption is the most effective. Some of them have emphasized bank debt services, others have emphasized taxes, while conversion is not a necessary means of redemption. In Europe, this approach to monetary analysis can be traced back, in rudimentary form, to Plato's *Law* and *Republic* (Monroe 1923).

Given that monetary instruments are conceptualized as financial instruments, their valuation is forward-looking and based on the perceived willingness and ability of the issuer to fulfill whatever the issuer promised. This financial promise takes the form of expected financial rewards via income payment(s) and/or principal payment(s):

$$P_t = \sum_{n=1}^{N} \frac{E_t(Y_n)}{(1+d_t)^n} + \frac{E_t(FV_N)}{(1+d_t)^N}$$

This is the chartal theory where the subscript t indicates the present time, P_t is the current fair price (the nominal price at which the instrument ought to circulate among bearers), Y_n is the nominal income promised at a future time n, FV_N is the (nominal) face value at maturity (usually it is equal to the face value at issuance, which itself is usually equal to the official value at issuance), E_t indicates current expectations of bearers about income payments and face value, d_t is the current discount rate imposed by bearers, and N is the time lapse until maturity ($n = 0$ is the issuance time). The face value may not be inscribed on monetary instruments, may change between the time of issuance and the time of redemption and may differ from the official value of the instruments. For example, the guinea coin was officially worth 20 shillings but was redeemed by the Exchequer at a higher value that changed over the course of the 17th and 18th centuries (Tymoigne 2020). The face/redemption value is the financial reward obtained by bearers when they redeem a monetary instrument.[9]

Graphically, the logic of the chartal theory can be explained with three economic agents, an issuer and two bearers:

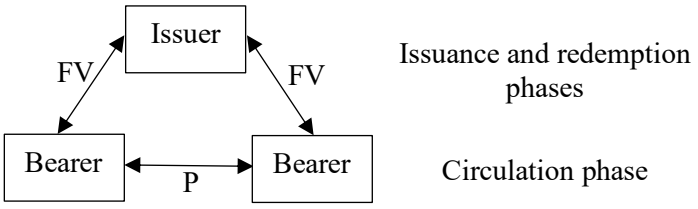

Figure 1. The financial logic behind the valuation of monetary instruments

[9] Two other possible complications are that a monetary instrument pays a compound interest rate or periodically depreciates by a given nominal sum while it circulates. In the first case, the redemption value is $FV_0(1 + y)^C$, in the second case the redemption value is $FV_0 – CD$, where FV_0 is the initial face value, y is the interest rate, D is the periodic nominal depreciation, C is the time in circulation.

Transactions between the issuer and bearers involve the injection and redemption of monetary instruments at face value. Transactions among bearers belong to the circulation phase of monetary instruments, during which monetary instruments change hands at the circulation/market value. In a well-working monetary system, monetary instruments circulate at their fair price, P; they trade at FV all the time. In order for that to be the case, the issuer must inject its financial instruments at face value (through spending, advances, or gifts) and it must promise to take back its financial instruments at face value on demand (i.e., whenever bearers want to redeem) and must not promise to pay any predetermined income. A zero-coupon, zero-term-to-maturity negotiable financial instrument has a fair price equal to face value.

Like for any other financial instruments, redemption (also known as reflux) is a relation between bearers and the issuer; bearers do not redeem a monetary instrument when they buy goods and services from each other, they circulate it. Put differently, the crucial mechanisms that ensure a monetary instrument circulates at par at all times are found in the redemption and issuance phases, not in the circulation phase. Network effects and conventions among bearers merely build upon the foundations set by the issuer and if these foundations collapse, the instrument loses its chartality, i.e., its financial characteristics, and so loses its stable nominal value. Bearers continuously test, judge, and revise their confidence in the issuer and so all monetary instruments (even coins with a small markup over intrinsic value) are fiduciary/token, that is, their valuation rests on the bearers' trust that the face value will be stable between the injection and redemption phases.

As such, the correct classification is not between "fiduciary/token money" and "real/commodity money" but rather between secured and unsecured monetary instruments, with the metal acting as a collateral for coins. This means that the Aristotelian distinctions among "fiat money," "credit money," and "commodity money" create a sharp distinction that obscures the common chartality of all monetary instruments. Regardless of how they are made, regardless of the entity that issues them, and regardless of the means used to issue them, all monetary instruments are financial instruments; they are chartal by nature and so their valuation follows the same logic as the valuation of bonds, mortgages, and any other fixed-income financial instruments.

Finally, what bearers do with a monetary instrument once it has been issued—and so the function(s) it performs—is not relevant to the nature of that instrument. A focus on functions relies too heavily on the subjectivity of the inquirer potentially allowing the influence of experience, prejudice, and bias stemmed from a society working under very different premises and mechanisms (Dalton 1965). The functional approach also merges monetary instruments and the unit of account. An object cannot be a unit of account, even if it has the same name as the unit; the latter is necessarily abstract and independent of any object. In addition, inquirers following the functional approach usually assume that monetary instruments must take a physical form, whereas they may exist mainly in an immaterial form. In the end, this approach may lead a scholar to confuse monetary payments and in-kind payments, to assume that there is a monetary system where there is none (Goldberg 2005), to make a truncated analysis of monetary systems consisting in merely recollecting objects, or to miss the presence of a monetary system.

Overall, the Platonic approach emphasizes the chartality/tokeness of all monetary instruments, a strict differentiation between commodities and monetary instruments, and a strict separation between the unit of account and monetary instruments with a necessity of the former for the latter to exist. This leads to a focus on the relevance of trust in the issuer and how to improve it; the study of political and economic powers of the issuer and their impact on the valuation and collateralization of its monetary instruments; a study of the emergence of units of account; and an emphasis on level and change in sovereignty and its impact on monetary dynamics. Importance is given to issues surrounding the source and impact of changes in the nominal valuation of monetary instruments in addition to issues surrounding purchasing power. Finally, chartality widens the analysis of monetary instruments beyond governments and banks while also restricting such analysis to things with financial characteristics to avoid confusing monetary transactions, bilateral trade, and generalized barter. The following develops the presentation of these core elements of the Platonic approach.

1.2.1. Chartality: Meaning and Implications

The financial logic behind the valuation of monetary instruments brings forward the chartality of monetary instruments, which raises several important points. First, “chartal” means token, sign, claim, pledge, coupon, promise, among other synonymous nouns. All monetary instruments,

from full-bodied coins to private bank accounts are chartal, because they represent a claim on the issuer who promises to redeem its instrument at par on demand. Such promise of redemption usually does not involve a pledge of conversion into commodities so monetary instruments are not claims on goods and services; this extends to loan contracts among bearers for which Nominalism applies. The monetary system is used to finance production and consumption, and its use depends on the ability of acquiring goods and services with monetary instruments, but the issuer does not promise that such ability will be stable over time. As such, a smooth continuous domestic depreciation (or appreciation) of the unit of account does not have any impact on the valuation of monetary instruments, because such depreciation (or appreciation) does not represent a default by an issuer. This does not mean that inflation (or deflation) is unimportant, but only that inflation (or deflation) has no bearing on the creditworthiness of the issuer, or monetary stability; only extremely rapid losses or gains of purchasing power impact the confidence of bearers in the monetary system.

Knapp is often criticized and dismissed for not having a theory of value—i.e., of purchasing power—or for assuming that the government can set the purchasing power of monetary instruments. Both critiques miss the mark as von Bortkiewicz (1919) notes:

> Chartality in Knapp's sense has absolutely nothing to do with the question of the value of money or the purchasing power of money, as Knapp does not take a close look at this question […]. He least thinks of asserting what Liefmann arbitrarily imputes to him, "that the state determines the purchasing power of money through its command of the nominal value", and when Liefmann commits himself to the "strictest rejection" of the so-formulated supposed support of Knapp's […], he only shows that he has completely misunderstood the main idea of Knapp's monetary theory. (88)[10]

[10] "Chartalität im Sinne Knapps, wie wir wissen, mit der Frage des Geldwertes oder der Kaufkraft des Geldes rein gar nichts zu tun, wie denn Knapp diese Frage, was uns ebenfalls bekannt ist [...]. Am wenigsten denkt er daran, zu behaupten, was ihm von Liefmann willkürlich imputiert wird, „daß der Staat durch seinen Nennwertbefehl die Kaufkraft des Geldes bestimmt", und wenn sich Liefmann zu „striktester Ablehnung" [...] so zeigt er damit nur, daß er den Hauptgedanken der Knappschen Geldtheorie gründlich mißverstanden hat."

As Knapp makes clear in Appendix 20 of his *State Theory of Money*, his analysis is focused on what determines the nominal value of monetary instruments and the extent of the area of par circulation, which are both central to understanding problems of solvency, liquidity, and financial crises. The study of the level and dynamic of purchasing power of the unit of account is a complementary topic, as is a theory of interest rate, and the study of the influence of monetary outcomes on economic activity.

Second, chartal/Chartalism is not synonymous with "state," while Knapp reduces the term chartal to tokens recognized by the law, he does note that the issuance of monetary instruments is not a privilege of the state and that private bank monetary instruments are chartal. The modern version of the Platonic approach recognizes that everyone can create monetary instruments, some of which may not be recognized by, or even known to, the law. The main problem is to issue them, i.e., to get them accepted by, and circulated among, bearers:

> An economy has a number of different types of money: everyone can create money; the problem is to get it accepted. (Minsky 1986, 228)

While governments and banks usually get the spotlight, tens of thousands of monetary instruments have been issued by localities, ecclesiastic domains, local seigneurs, taverns and other private agents in many periods of monetary history, worldwide, up to the present (Fletcher 2003; Burn 1853; Von Glahn 1996; Blanc 2017; Labrot 1989). All these instruments are part of a pyramid/hierarchy of monetary instruments; a concept used to categorize the variety of monetary instruments according to their degree of general acceptance, that is, how widely they circulate at par in a given common area, and the extent of the operation of a payment system and its integration within other payment systems. While the given common area is often the domestic economy, the international scale has also been considered (Palludeto and Abouchedid 2016; Conti et al. 2013). Something does not have to circulate at par on the entire common area to be considered a monetary instrument; general acceptance may be limited to a narrow area of a nation (e.g., local currencies). The area of general acceptance of monetary instruments in the lower levels of the pyramid can be extended if they are supported by a more creditworthy issuer and/or integrated into the payment system of an issuer that is higher in the pyramid. For example,

government has increased the area of general acceptance of private bank monetary instruments via guaranteed convertibility at par among different bank monetary instruments, lender of last resort policy, the creation of an elastic currency, government resolution mechanisms, and its use of the private banking payment system.

Third, contrary to by Genovesi's opinion in the preamble, the financial valuation of monetary instruments is not arbitrary. Such valuation is not based on fiat and "taking a cut" in the minting process, but rather on the expected ability and willingness of the issuer to fulfill what it promised to do; that is, the issuer's creditworthiness is a key determinant of acceptance. As such, the degree of liquidity of a monetary instrument, and so its place in the pyramid, depends on the ability of its issuer to "acquire credit" (Innes 1913, 393), "to force cash flows" (Minsky 1986, 71) from others. The larger the network of willing or forced debtors that owe an issuer of monetary instruments and the stronger the redemption channels, the broader the area of acceptance of its monetary instruments. The extent of the area of acceptance at par of a monetary instrument depends on the issuer's political power (such as the ability to impose and collect tribute or tax debts) and/or its economic power (such as the size of reserves if conversion is possible, or the ability of banks to collect on debts owed to them).

An issuer can improve its debt imposition and collection mechanisms by focusing on very concrete factors. A government can develop a mature tax system with efficient collection, fight corruption among tax collectors, and put in place a well-developed enforcement and punishment mechanisms against tax debtors. This relies not on convention or arbitrariness but on political and military powers, among other factors such as technological and accounting innovations that allow it to keep track of dues owed and paid. This is where the notion of sovereignty, as opposed to seigniorage, becomes important to explain the circulation of government monetary instruments at par (Wray 2003). If a government issues a convertible monetary instrument, its creditworthiness is improved by having a larger stock of what it promises to convert into. For private banks, improvement in creditworthiness can be obtained by developing a mature debt collection system and providing them access to an elastic supply of government monetary instruments (if private bank instruments are convertible into government monetary instruments).

This relation between general acceptability and ability to impose and collect debts brings up the power relations that underpin monetary relations. Power relations originate in ancient societies and the transformation of tribal obligations into generalized, compulsory, and standardized obligations owed to an authority that aims at commanding available resources (Tymoigne and Wray 2006). When this power relation involves the governing authority, issues of sovereignty, political legitimacy and accountability, individual privacy, and force all come to play a role in validating and reproducing this power relation. When this power relation involves banks, the struggles between creditors and debtors over debt laws come to the forefront, and issues of unsafe underwriting practices, predatory credit and rapacious debt collection practices are points of contention. The study of these power relations is a core element of monetary analysis.

1.2.2 Nominalism and Its Implications

A second element of the Platonic approach is Nominalism. By default, debt contracts are promises to pay fixed nominal sums and, over the course of the contract, such dues cannot be adjusted to accommodate for change in purchasing power (Valorism) or changes in the metallic content of coins (Metallism). A corollary is that monetary instruments tendered to settle debts ought to be valued according to their face value at the time of payment, regardless of their intrinsic value and regardless of what their face value was at issuance.

Nominalism does not imply that creditors and debtors are forbidden to add a Valorist or Metallist clause to a contract—e.g., Bloch (1955, 68–9) notes that a Metallist clause was often added, more or less willingly, in medieval commercial contracts—but it is up to the contracting parties to do so. Nominalism also does not imply that it was easy to enforce the official value of coins during the payment of dues. Nominalism also does not imply that the Platonic view is pro-inflation or pro-deflation. A relatively stable purchasing power of the unit of account is important for a well-functioning monetary system, but Nominalism argues that it is up to everyone to hedge against purchasing power fluctuations (and/or precious-metal content fluctuations in the past). The government can help to promote price stability by putting in place policies such as buffer stock policies, efficiency standards, proper budgetary rules, among others, together with proper issuance and redemption mechanisms for all its monetary instruments and non-government instruments.

The widespread adoption of Nominalism by legal systems throughout the world is not merely a legal oddity that has no bearing on the economy and economic theorizing. First, it changes the incentive mechanisms because economic units must care about nominal outcomes when they make economic decisions. Business runs on Nominalist principles and evidence shows that there was no automatic and complete adjustment of domestic prices and contracts to the quality of the coinage. Second, Nominalism implies that liquidity and solvency are nominal concepts, which requires that a perfectly liquid financial instrument exists, that is, instruments that circulate by tale at a constant nominal value at all times. This leaves open the question of how that nominal value is fixed, which is when an understanding of the valuation logic based on finance becomes crucial. Chartalism and Nominalism are complementary components of a Platonic approach to monetary analysis. An economic system working under Nominalist principles requires a perfectly liquid financial instrument in order to work properly. Third, prices, obligations and transactions are not measured "in gold" or "in silver" or "in coins," they are measured in sterling pound, denier, sestertius, and other monetary units that do not signal a requirement to pay a given quantity or quality metal. A debt of 480 deniers is not a debt "in silver" (even if silver coins of high quality called "deniers" were loaned), but merely a promise to pay 480 units of a unit of account called denier. In order to make it a debt payable in a quantity of silver, an additional clause in the contract must be added that adjusts dues to the quality of the coinage; by default, all parties ought to understand that only a fixed nominal sum is due.

1.2.3 Unit of Account and Monetary Instruments

A monetary system is composed of a unit of account and monetary instruments denominated in that unit of account. These two components are not two different types of "money," one "real" and one "imaginary," they are complementary elements of a monetary system.

While the Aristotelian approach sees coins as the "real money," monetary instruments do not have to be a physical thing but may be mere funds in accounts on a ledger. Given the emphasis on chartality over materiality in the Platonic approach, the "real" element in a monetary instrument is not its material composition but rather the incorporeal financial bind it creates

between the issuer and the bearers. What makes a monetary instrument "real" is not the material, it is the promise made by the issuer.

The unit of account is not one of the possible functions of a monetary instrument but rather a precondition for the existence of monetary instruments given that all monetary instruments, prices, assets, debts and transactions must be measured in such unit. As such, units of account necessarily precede coins, notes, bank accounts, and any other monetary instruments. Even if a unit of account takes its name from an existing coin—as it used to happen quite often in medieval times when people and merchants became accustomed to using a well-like coin to count; the florin, the gros, the guinea, among others[11]—such coin already is denominated in a unit of account that states its official and circulation value; the name of the coin is merely added to the denominational scale of the existing unit of account. For example, once the guinea unit (gn.) was officially established in 1717 at 21s., the denominational scale became 0.952gn. = £1 = 20s. = 240d. A corollary is that units of account do not refer to coins, even if the name of the unit of account and the name of a coin are the same; units of account are mere counting tools. If a unit such as guinea, solidus, or denier were obviously mere reflection of gold and silver coins, no dispute would have occurred among contracting parties, no intellectual debate among legal scholars about the meaning of monetary payments would have occurred, and the distinction between Metallism and Nominalism would have been unnecessary.

Given that units of account and monetary instruments are distinct, it is to be expected that some of the denominations of the unit of account may not have monetary instruments that represent such denomination. The classical example is the Carolingian monetary system. The main unit of account was the denier, which was defined as 1/12 of a shilling and 1/240 of a sterling pound and, originally, a sterling pound was supposed to represent a pound of sterling silver (0.925 fine silver). Once this unit was set, a coin officially worth 1d. was issued; coins worth £1 or 1s. were

[11] Block (1955, 48) notes: "Almost all coins that were commonly used became a money of account. When the coin was no longer struck, remembrance of it persisted and its name was used as a standard to evaluate the fineness, and subsequently the exchange value, of new coins" (« Il n'est presque aucune monnaie réelle d'usage un peu général qui n'ait tendu à se transformer à son tour en monnaie de compte. Quand la pièce avait cessé d'être frappée, son souvenir subsistait et servait d'étalon pour apprécier la teneur et par suite la valeur d'échange des pièces nouvelles. »)

not issued.[12] This does not make the sterling pound or shilling "imaginary money" because units of account are already abstract by nature and they are distinct from the monetary instruments expressed in them.

In addition, it is expected that there may be a "décrochement" between the two elements of a monetary system; that is, that a coin or note named after one of the denominations of the unit of account may not be worth such value. In England, the penny coin was mostly debased to prevent its intrinsic value from going above 1d. as the price of silver rose, an early example of monetary policy to promote financial stability by keeping the nominal value of the coinage stable (See Appendix 1).[13] However, the gros coin was worth one gros (i.e., sou) unit, i.e., 12 d., at the time of its creation but not at other times (Van Werveke 1955; Redish 2000). The 20s. gold coin nicknamed "guinea" circulated consistently above that value. Once the denominational unit called "guinea" was officially created, the guinea coin did trade above 21s. (see Appendix 1). This discrepancy between the unit of account and the nominal value of a coin named after one of the denominations of the unit reflects either a deliberate decision of the issuer or a lack of proper monetary management.

The core point is that a unit of account is not a physical thing, it is a mere unit of measurement that may have a physical representation (such as a coin) at a point in time but is not bound, or defined, by that physical representation. The fact that there was a gold standard or silver standard that fixed the price of a precious metal in relation to the official unit of account does not mean that a unit of account is defined by that metal. It only means that the government applied a buffer stock approach to a commodity, the price of which is fixed in terms of the unit of account (*x* dollars per oz of metal) rather than the other way around (*y* oz of metal per dollar). It is backward logic to state that units of account are measured in a gold coin or a silver coin, or have a constant

[12] Originally, given that 240 deniers were struck out of 1 lb. of sterling silver and given that only sterling silver was used to make coins, a £1 coin would have had to weight 1 lb. to avoid arbitrage between the pound coin and the denier coin (e.g., if the £1 coin weighs 0.5lb, bearers can melt 240 deniers to obtain two £1 coins; they will do so until all deniers disappear from circulation or they trade at a premium that remove the profitable arbitrage).

[13] As debasement occurred, 240 denier coins no longer contained 1 lb. of sterling silver but the unit of account continued to be based on the denominational scale £1 = 20s. = 240d. and the penny continued to be worth 1d.

value relative to a gold coin or a silver coin, rather all coins are measured in terms of a unit of account and their nominal value (measured in that unit) can change.

1.2.4. Management of Monetary Systems When Chartality and Nominalism are Considered

Such monetary analysis has important implications for monetary management. The primary role of the issuer of a monetary instrument is to manage the issuance and redemption of its monetary instrument in a way that ensures that $P = FV$ at all times. This means issuing and redeeming endogenously its monetary instruments, and guaranteeing par convertibility among the different monetary instruments it issues. In terms of issuance, endogeneity means ensuring that the supply is elastic within the limits that constrain its soundness; profitability and regulation for for-profit institutions, and resource and political constraints for the government. It also means making counterfeiting difficult.

In terms of redemption, maintaining nominal parity means that the issuer should accept on demand and at par any of its monetary instruments returned for conversion or payment of dues, regardless of how torn or worn they are, as long as they are not counterfeits. The promise to redeem on demand at par is only valid within an area delimited by the issuer. For a government, it usually means its area of influence (the nation state in modern times); for a bank, it depends on how widespread its business is. If the creditworthiness of the issuer is strong, its monetary instrument is generally accepted, which means that it circulates at par within its area of influence. If issuance and redemption are not well managed by the issuer, a monetary instrument may circulate at a discount or at a premium within the area of influence of the issuer. Outside of the area of influence, a monetary instrument may circulate at or below par depending on the demand for that instrument.

The material content should be managed to ensure that the intrinsic value never dominates face value. This ensures that coins stay in circulation (instead of being melted) or that they do so at a constant nominal value. By itself the material used is irrelevant to the nature of a monetary instrument, but a precious metal might be used to increase the acceptance of monetary instruments if the creditworthiness of the issuer is weak or counterfeiting is too widespread. It is best to make access to the collateral conditional to default rather than allowing access at the

discretion of the bearers. Default means the inability of bearers to redeem on demand at par. Some scholars within the Platonic approach want to back monetary instruments with a precious metal, but not because they agree with the commodity theory but rather because they are not confident in the creditworthiness of the government. The existence of a collateral does not reflect a well-working monetary system, it reflects the fragility of, or limited trust in, existing socio-politico-economic institutions. The goal is to improve the creditworthiness of the issuer and its control over the illegal issuance of its monetary instruments to find a way to get rid of precious metals so that monetary instruments can be perfectly elastic and can respond to the financial needs of the domestic economic system.

As much as possible the material used should be easy to source, but the issuance of specific monetary instruments should not be left to whomever has the material because monetary instruments are a claim on the issuer. If anybody can make the monetary instrument of an issuer, that issuer will see its economic and/or political power imperiled. A government issues monetary instruments to gain access to resources, which people accept as means of payment for the goods and services they sold to the government because people trust the government's promises to accept its instrument as a means of settlement of the tax debt unilaterally imposed on them. If anybody can make government monetary instruments, the population no longer has to sell goods and services to the government to obtain what will allow them to pay their tax debt. Similarly, if bank monetary instruments can be made by anyone, bank debtors can easily service bank debts (and they no longer need to be indebted to banks to obtain monetary instruments) and banks will be flooded with conversion requests. As such, the issuer must have a monopoly over the issuance of its monetary instruments. This does not mean that other entities than governments and banks cannot issue coins or notes, but they ought to put their name or sign on such monetary instruments so that bearers know where to redeem them.

The emphasis on the role of bank debt and taxation brings forward three important aspects of monetary management. One, redemption mechanisms are complementary to issuance mechanisms. They are means of returning monetary instruments to their issuer rather than a means of financing the issuer. The coins and notes received in tax payments do not finance a government that issued them, tax revenues merely return them to the government. Debt services

do not finance banks, they return to banks the monetary instruments they issued through credit operations. As such, the government should not understand the issuance monetary instruments and taxation as alternatives, but rather as complementary elements of a well-functioning monetary system. Two, a weak ability to tax in coins does not provide a sound justification for the issuance of inconvertible paper notes; put differently, inconvertible paper notes are not a means to finance a deficit, they are one among many monetary instruments used to finance all spending. A sound issuance of inconvertible paper notes requires the establishment of a tax base for their redemption. Three, this does not imply that tax payments should match government spending, but that there should be a means for bearers to redeem the notes at their convenience for such payments, either directly or through the banking system. Most of the time, bearers want to hoard some government monetary instruments and other government financial instruments and so the fiscal position should be accommodative to these preferences. If automatic stabilizers are present, tax revenues will usually be smaller than government spending; that is, fiscal deficits are a stylized fact of national public finances because the fiscal balance accommodates the needs of the economy to accumulate government financial instruments (Tcherneva and Tymoigne 2023; Wray 2015).

2. THE HISTORICAL DEVELOPMENT OF THE PLATONIC APPROACH IN EUROPE

Scholars who have contributed to the development of the Platonic approach have done so more or less consciously. They may not have been aware of the full implications of their argument, with dramatic negative consequences from botched implementations, or they may have contributed to an element of Platonic approach while still using the Aristotelian approach as their main framework of analysis.

While Plato (428/423–348/347 BC) provided some one-off remarks on monetary questions, the real impetus for the inquiry into the nature of monetary instruments in Europe is found in discussions by Roman legists regarding the nature of monetary debts such as rents and loans. As such, this section starts with the rise of Nominalism to understand how scholars progressively moved away from the commodity theory. Originally, the debates are centered around the coinage

issued by the sovereign and feudal lords, but later extended to other monetary instruments. Scholars came to agree on the role of fiat, i.e., authority or "power of the prince," in choosing the face value of the coinage, but it took quite a long time to flesh out its enforcement. A mere legal declaration that a coin must circulate at its face value will not do, there must be financial mechanisms in place to ensure that circulation at par does occur and this is where redemption becomes crucial. Scholars progressively identified several channels of redemption.

2.1. The Road to Nominalism in Europe

2.1.1. Debt Settlement: Nominal Sums

While the aes coin was debased in the third century BC, one has to wait for the debasement of the denarius coin in the first and second centuries AD to make Roman legal scholars consider Nominalism in the settlement of private contracts (Lo Cascio 1996, 276–7): is the principal due (*mutuum*) a quantity of metal or a numerical sum? A corollary debate concerns the point of reference to use when a coin is tendered to settle private debts: should creditors record the payment by computing the face value or should they use the quantity of precious metal embedded in the coins? The answers to these questions led to the rise of Nominalism and considerations about how the face value is set. Some of these deliberations are available in the Justinian *Codex* and *Digest*; legal documents that compile first to fourth century AD Roman legal thought and edicts on civil law. They were created by order of Emperor Justinian I in 529 AD to reform the Byzantine legal system. Elements of Nominalism are found in both documents. For example, Ulpian (170–223/28) states:

One who sues for a fixed amount of money uses the action under the rubric, "if he makes a fixed claim." However, if the suit is for other things, he sues by the *condictio* for fixed quantities. It is right to make the general proposition that[,] excepting only money[,] all kinds of property are claimed by this action whether handled by weight or by measure and whether movable or pertaining to the realty. (Ulpian in *Digest*, Book 13, Part 3, §1 in Watson (1998a, 393))

The quality of the thing given only matters in in-kind debts and it ought to be obvious to all contracting parties that, by default, the same quality of goods must be given back:

> Even if there is no provision in a loan for consumption that the thing returned should be of the same quality, the debtor is not allowed to give back something which, though of the same kind, is of inferior quality, for example, new wine for old. (Pomponius in *Digest*, Book 12, Part 1, §3 in Watson (1998a, 357))

On the contrary, for monetary debts, only a nominal sum is due and, by default, can be paid with coins of any quality. If the creditor cares about the quality of the coins to be tendered, it is his responsibility to add such a clause in the debt contracts:

> However, although it is agreed that there are as many stipulations as sums of money, and as many as there are articles of property, yet if a person stipulates money which is in full view, or a heap of money, there are not as many stipulations as there are actual coins, but a single stipulation; for it is ridiculous that there should be individual stipulations for each individual denarius. (Ulpian in *Digest*, Book 45, Part 1 §29 in Watson (1998c, 167))

Similarly, Julius Paulus (2nd–3rd centuries AD) famously notes that "a material, struck with an official seal, holds its usefulness and ability to discharge debts, not from its substance but from its official value."[14] Roman jurists also rejected Valorism, a promise to deliver a monetary sum is not a promise to provide a fixed quantity of commodities:

> Put the case that I accept a surety on the following terms: "Since I advanced ten, do you, on your honor, promise in respect of that money a thousand modii of grain?" The surety incurs no obligation since a surety cannot be committed for something other than what was advanced; money cannot be quantified in terms of merchandise in the way that merchandise, measured by quantity or number, may be assessed in money. (Javolenus in *Digest*, Book 46, Part 1, §42 in Watson (1998c, 206))

Overall, Thomas (1899, 50ff.) concludes, disapprovingly, that Roman jurists agreed the initial nominal sum due is the point of reference in private monetary debts, although the texts available

[14] « eaque materia, forma publica percussa, usum domoniumque, non tam ex sbustantia praebet quam ex quantitate, nec ultra merx utrumque, sed alterum pretiuam vocatur » (Paulus in Gonnard 1935, 53–4)

in the Justinian legal documents do not deal explicitly with cases of debasement (Rüfner 2016; Ernst 2016). At the same time, one does find in the *Codex* and *Digest* some passages with Metallist positions. Gaius (120–80) applied Metallism to the coinage:

> However, the giving of a loan for consumption *(mutuum)* operates in the case of things which are dealt with by weight, number or measure, such as wine, oil, corn, cash money, things which we hand over with the effect that they may become the property of the recipient, and so that we shall afterward receive back other things of the same kind and quality. (Gaius in *Digest*, Book 44, Part 7, §1 in Watson (1998c, 153))

In the last part of the 360s AD, Emperor Valentinian I and his brother Emperor Valens ordered that gold coins may pass by weight in private transactions:

> We order that the solidi minted out of veneration for the old emperors be handed over and received by buyers and sellers in such a way that no objection (*refragatio*) might arise, as long as they are of the weight owed and proven type (*species*); (Emperors Valentinian and Valens Augusti to Germanus, Praetorian Prefect in *Codex*, Book 11, Title 11, §1 in Blum and Frier (2016, 2679))

If old solidus coins are light, a discount can be applied. Overall, Nominalism was applied to private debts unless it led to large purchasing power losses for creditors, which was the case from the late third century and even more so in the fourth century when hyperinflation set in (see Appendix 2).[15] Similarly, the tax system seems to have followed Nominalist principles until

[15] "The entire system of credit was also affected by the uncertainties created by the devaluation, which undermined the value and conditions of loans and their repayment. […] At all periods, inflation normally has the effect of reducing the burden of debts. […] [Landowners] were able to retort by making the debt payable in kind, in sacks of wheat and amphorae of wine." (Corbier 2008b 427–8).

"Mommsen was equally aware of the redistributive effect of monetary policies. He noted the revolutionary effect of the *Lex Valeria* of 84 B.C., by which the As Librale worth 1/10 of a denarius was suppressed and replaced by another As worth 1/16 of a denarius. Debtors were allowed to repay old debts with the new As. This measure, he writes, was the equivalent of a discount of 75 per 100 on the capital that had been lent out, and was brought about merely by changing the unit of account. 'A legalized bankruptcy was thus consummated,' he wrote, 'But this state of affairs was too violent and arbitrary to last. Sulla quashed the *Lex Valeria* and reinstated the old unit of account.'" (De Cecco 1985, 811–2)

following such principles was no longer an effective means of channeling resources to the Roman state. For example, an edict by Constantine the Great in 325 AD states that solidus coins received in tax payments may be weighed:

> Gold that is paid by taxpayers shall be received with a fair balance and weights, if anyone wants to weigh out solidi or bullion. (Edict of Emperor Constantine Augustus in *Codex*, Book 10, Title 73, §1 in Blum and Frier (2016, 2641))

The historical context for this edict is the political and economic instability of the 3rd and 4th centuries. The state first resorted to in-kind taxation (Hopkins 1980), but taxation to be paid in solidus coins grew because in-kind taxes no longer fit the needs of a constantly moving army. This led the government to apply Metallism to taxation by letting the face value of gold coins float and treating them as bullions in tax payments,[16] going as far as melting down all the solidus

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« les réévaluations brutales des pouvoirs libératoires […] semblent avoir été sources de conflits entre les créanciers et les débiteurs, comme le laisse croire le complément de l'édit d'Aphrodisias relatif aux conditions du remboursement des dettes contractées avant le doublement des pouvoirs libératoires des monnaies. De ce point de vue, le système des réductions pondérales et les réductions des pouvoirs libératoires des unités de compte favorisaient les créanciers. » (Depeyrot 1992, 44) (The brutal enhancements of the coinage […] seem to have been a source of conflicts between creditors and debtors, as shown by the complement to the edict of Aphrodisias concerning the conditions of reimbursement of debts contracted prior to the doubling of the face value of the coinage. From this viewpoint, debasements and abatements favored the creditors."

« [Les débiteurs] sont tenus du même nombre de monnaies qu'ils auraient payé, selon le pouvoir libératoire légal reconnu que la monnaie avait, avant que, par effet de notre prévoyance et en vertu de la seule loi présente, une augmentation ait eu lieu. Que ceux à qui cette disposition est imposée ne pensent pas qu'il y ait dans notre décision aucune iniquité: il apparait (bon) en effet qu'ils s'aquitent de la somme due conformément au pouvoir libératoire légal selon lequel ils ont manifestement reçu les pièces' Il, Édit d'Aphrodisias, trad. J. GUEV, » (Quote in Depeyrot 1992, 44, n. 31) (Debtors must give the same number of coins that they would have paid prior to the enhancement of the coinage that occurred due to our foresight and in line with the current law. Those on whom this decision is imposed should not see any inequity in our decision: it seems (good) indeed that they pay the sum due according to the face value that prevailed when they received the coins.)

[16] "The solidus quickly gained strength as an empire-wide unit of value and then retained that strength because of the choice of Constantine and his successors never to alter its characteristics. This made the solidus an excellent monetary instrument for estimating debts, so much so that it quickly became standard to reckon loans only in gold solidi. […] By overtaking fixed relations of exchange with the silver coin, it became a true floating currency. The fact that taxes were demanded in gold contributed, for example, to a growth in the demand for the solidus as a commodity. Thus, the value of the solidus regularly increased at times when taxes were collected." (Depeyrot 2006, 239). A well-documented case of instability generated in part by the lack of coinage to pay taxes is what happened to the guinea coin at the end of the seventeenth century (Tymoigne 2020).

coins received because of fear of forgeries and corruption.[17] Taxation to be paid in solidus coins was equivalent to paying taxes in a fixed quantity of gold. If tax payments could not be made with solidus coins, which was the case most of the time, extra payments had to be made to compensate for the rising relative price of gold.[18] Consistent with metallism, Corbier (2008a, 375) states that, between 193AD and 351AD, tax redemption was done at the rate coins were issued even if nominal mutations occurred between issuance and redemption.

Following the fall of the Western Roman Empire, there is a retrenchment of the monetary sphere and banking disappears from Occidental Europe (Bogaert et al. 1991, 71). Coins are issued by a variety of issuers, sometimes unknown, but they pass as bullions and the control of the sovereign over the monetary system is weak as is the taxation system (Cipolla 1967, 11–2; Eagleton and Williams 2011; Depeyrot 2020; Sédillot 1953, 28). Monetary thought disappeared, or at least has not reached us; there is an interruption in Western European monetary thinking lasting seven centuries.

Attempts at recentralization of coinage in the eighth century via the Carolingian reforms, the willingness to tax in coins under the guise of a growing fiscal power, and the reemergence of commercial routes in the tenth century all led to a re-monetization of Europe that reached the borders of the former Western Roman Empire by the tenth century and then proceeded eastward through Carolingian and Saxon conquests (Eagleton and Williams 2011, 71–2). However, the coinage was simple—early pennies (sceattas) and then the silver denier/penny—so scholarly interests in monetary phenomena was still absent.

[17] "Given the production of forged and debased gold solidi by corrupted officials, Valentinian I decreed that all gold paid as taxes should be pure and delivered to the imperial treasury in bullion form, thus requiring the regular melting down of coin." (Moorhead 2012, 602)

[18] "La monnaie d'or s'apprécie par rapport à l'argent. Mais, dans l'ensemble, le circuit de la fiscalité restitue à l'État la monnaie d'argent dépréciée qu'il a mise en circulation. L'État a donc recours à des impôts qui, même s'ils sont acquittés par le contribuable en d'autres monnaies, doivent lui être versés en or, avec les frais supplémentaires que cette conversion implique." (Corbier 1978, 297)). "Gold coins appreciate relative to silver coins. But, overall, the fiscal circuit returns to the State the depreciated silver coins it put into circulation. The state, thus, imposes taxes that, even if paid in other coins, must be paid in gold, with supplementary costs implied by the conversion."

The context for the return of monetary thinking includes the growing use of nominal mutations (enhancement and abatement) of the coinage in addition to metallic mutations (debasement and reinforcement) under Phillipe Le Bel (1265–1314),[19] the demonetization and disappearance of coins used as point of reference in contracts, as well as the emergence of coins of different denominations and made of different metals starting with the silver gros coin issued by the doge of Venice Enrico Dandolo (1107–1205) and other Italian cities followed by the widely successful gros coin issued by Saint Louis (1214–70) (Sargent and Velde 2003, 69ff.; Thiers 2016, 154; Sédillot 1953; Bloch 1955, 36ff.). These monetary developments led to an evolution in Canonist and Legist thoughts as disputes among contractual parties over the meaning of payment needed to be settled by courts (Hubretch 1955; Thireau 1980; Thiers 2016; Ernst 2016).[20]

From the eleventh to the thirteenth century, French, Italian and German glossators comment extensively on the monetary content of the *Digest* and *Codex*, and Canonists (led by Pope Innocent III) also devote more time to monetary issues. To study monetary problems, glossators use as a reference point the discussions about in-kind debts in Roman law (Ernst 2016, 123), which naturally lead them to a Metallist interpretation of debt settlements. The Metallist framework used by the Romanists and Canonists is progressively modified by Nominalist concerns from the thirteenth to the fifteenth century (Ernst 2016; Thiers 2016); the conversion to Nominalism is well on its way in England from the thirteenth century and completed by the fifteenth century (Fox 2016, 207), but it takes longer in continental Europe with French jurisprudence leading the way.

Elements of Nominalism emerge in the twelfth century; medieval scholars follow Paulus in using the word "quantity" to mean the official value. An anonymous Glossator argues that "if a

[19] Enhancement (also known as "crying up") means that the official value of the coinage is raised, abatement (also known as "crying down") means that the official value of the coinage is lowered. Debasement means that the quantity of precious metal in the coinage is lowered (by lowering the weight of the coin and/or lowering the fineness of the precious metal), reinforcement is the opposite.

[20] Du Moulin (1547, 392, §285) presents one of such case. A debtor wanted to buy back a rent of 2,400 francs (48,000 sous) (i.e. repay the principal on a loan of 2,400 francs). When the rent was contracted in 1505, the debtor received the 2,400 francs in the form of 1,332 écus worth 36s. each, for a total of 47,952s., and some miscellaneous coins. In 1535, the debtor only wanted to give back 1,066 écus because one écu was now worth 45s, which together with some change was enough to repay the 48,000s. The creditor refused and demanded 266 extra écus.

stronger coin used to circulate and now only a lighter one does by order of the prince, I shall be freed from my obligation by paying with the light coin."[21] In the thirteenth century, French jurist Guillaume Durant (1237–96) argues that wages and fines can be paid with lighter coins but not debts and annuities. Around 1295, Jacques de Arena is the first to differentiate between nominal and metallic mutations. In the fourteenth century, Jean Faure (d. 1340) argues that Nominalism ought to be generalized to all payments without exception (Thireau 1980, 405ff.) and, in the fifteenth century, Italian jurist Girolamo Butigella (1470–1515) reaches the same conclusion:

> For if the substance remains the same but the form changes, as I was just saying in the case of the Venetian ducat, I cannot see why the debtor should be forced to pay to cover the ancient form, since it does not matter to the creditor as long as the form is paid […]. Coins made of a variety of materials can be used to pay back [debts] […] the quality of the material is not considered in money, only the estimation, […] in a debt of money the matter is not considered, only the estimation, […] which means that money provides its use not from substance, that is, not from matter, but from quantity, that is from value. (Butigella 1608, 85–6)[22]

These legal opinions, however, did not become prevalent in continental Europe until the sixteenth century. In the meantime, in continental Europe, Italian legist Bartolo da Sassoferrato (1313–57), aka Bartole, provides an intermediate position that held for two centuries: unless a contract specifies that particular coins must be paid, only the nominal sum is due regardless of mutations (Hubrech 1955).

[21] « quod si primo currebat fortior moneta et modo currit vilior de mandato principis liberor solvendo viliorem » cited in Theirs (2016, 153).

[22] « Nam si remanente eadem materia est mutata forma , ut modo dicebam in duca tis Venetis , nelcio videre quare cogatur debitor soluere tecundum antiquam formam, cum non intersit creditoris sec dum quam formam soluatur. […] etiam in diversa materia possit pecunia reddi […] qualitas materiæ non consideratur in pecunia, sed solum æstimatio […] quod in debito pecunię non consideratur materia, sed æstimatio […] quod significat , quod pecunia præbet usum suum non ex substantia, id est non ex materia, sed ex quantitate, id est ex valore »

In the sixteenth century, under the influence of French legist Charles du Moulin (1500–66), who extends and systematizes Jean Faure's positions, continental Europe sees a definitive shift in legal thinking toward Nominalism (Thireau 1980, 405ff.):

> 688. I ardently conclude that, even though a certain number of aureus coins, or any other types of money, is used to trade and to assert profit or gain, such gold coins or money must not be considered in transactions principally as a specific type of money nor under consideration of a certain material, but rather as a quantity and in reference to a certain monetary sum,[…]. And, thus, a sum due, once determined, can no longer be increased or decreased, under the pretext of the depreciation or appreciation of the coinage in the interval [between the acknowledgement of a debt and the payment of that debt]. (Du Moulin 1545 [1681], 283)[23]

As such, the material of the coinage does not matter for contract settlement as Paulus concluded 1,300 years earlier:

> 694. […] First, because the very form and substance of money, in so far as it is money, is not the material or the natural form of the body of money itself, but the assigned value: hence any money, as such, is not brought into a contract or any arrangement, except under the consideration of the current official value. (Du Moulin 1545 [1681], 285)[24]

Du Moulin argues that Nominalism makes sense because the coins obtained from a loan are used immediately to purchase whatever their face value allows at the time (so nominal value is the basis of expenses), and, when profits are recorded and distributed, coins are also computed at their current face value. As such, if the face value of a coin rises and the same number of coins

[23] « 688. Altiùs & radicitùs declaro , quia ex quo certi aurei, seu quælibet certa species monetæ datur ad negotiandum & lucrum vel commodum asserendum salva sorte, necesse est quòd ea species aureorum vel monetæ deducatur in dispositionem principaliter non tanquam certa species monetæ, nec sub ratione certorum corporum, sed tanquam quantitatis, & sub ratione unius certæ summæ pecuniæ, […]. Et sic ea sors semel limitata & determinata non potest amplius augeri vel minui in se, prætextu augmenti vel decrementi specierum numeratarum ex intervallo supervenientis »

[24] « 694. […] Prima, quia forma ipsa & substantia monetæ, in quantum moneta, non est materia vel forma naturalis ipsius corporis monetæ , sed valor ipse impositititius : unde quælibet moneta, in quantum talis, non deducitur in contractum , vel quamcunque dispositionem , nisi sub ratione valoris vel quantitatis impositititia tunc currentis. »

must be paid, the debtor is paying more in nominal terms; the creditor records a capital gain, while the debtor records an additional expense. This goes against the terms of contracts that set fixed nominal dues and also against business practices that focus on nominal outcomes to record gains and losses. Credit transactions are financial transactions, they do not involve borrowing physical assets that must be given back; only an abstract numerical sum must be paid. Du Moulin also argues that Nominalism is sound only as long as mutations are not frequent, otherwise people will distrust Nominalist contractual agreements as well as the ability of the coinage to settle them. As such, he provides exceptions to Nominalism under some circumstances such as temporary mutations (Thireau 1980, 417).

Guy Coquille (1523–1603) and François Hotman (1524–90) also conclude that, unless a contract specifies which type of coins must be used to settle a debt, the official value is the point of reference in the valuation of the coins tendered. A loan of specific coins does not mean that similar coins must be used to service the loan, nor does the unit of account in which the loan is recorded (aureus, ecu, dollar, etc.) refers to any specific coins even if there is a coin that has a similar name:

> The settlement of monetary obligations tallies neither the quality nor the number [of coins], but only of the power [of coins]. The quality consists in the material and in the public form. We call power, the price, or, as it is commonly said, the value assigned to a coin by public law. Just as with gold, or silver, or brass, or even iron, and even more so leather, a certain power is attributed [to coins] by public authority. […] Of course, the value, or power, can be called by several names, and, therefore, when someone owes one aureus, he does not owe this type of coin, but rather the value of it, paying in whichever of the following ways is the same thing, one aureus coin, 25 denarius coins or 100 sestertius coins. (Hotman 1598, 96)[25]

[25] « In obligatione numoru neq qualitatis , neq numeri , sed solius potestatis rationem duci. Qualitas autem primum in materia deinde in forma publica consistit. Potestatem autem appellamus , pretium , siue, ut dici vulgo solet, valorem ei iure publico attribuitum: sicuti cum aurea , vel argentea , vel aereae , vel etiam ferrea, atque adeo coriacae laminae certa potestas publica auctoritate attribuitur. […] nimirum valorem siue potessatem pluribus nominibus appellari ac proinde cum quis aureum debet , non praecise corpus eiusmodi aliquod debere , sed potius ipsius valorem : & si quis pro aureo vel xxv. Denarios , vel c. sesterrios reddat , non aliud pro alio , sed eandem rem reddere. »

> Subjects must value coins according to the stamp, price, and rate set by the sovereign, without inquiring about the intrinsic goodness, which is what the law states […]. The borrower is not obligated to pay back a loan with the same strong coins that were handed to him; […] the borrower will be clear of a debt by tending [coins] […] according to the extrinsic value […] that the king assigned to all current coins. (Coquille 1611 [1703], 314)[26]

Unless some restrictions exist on the legal tender ability of certain coins, coins of any material can be tendered to the creditor to pay a sum expressed in a unit of account. In the seventeenth century, Jean Domat (1625–96) continues to distinguish monetary debts from in-kind debts:

> VIII. For a monetary loan, the debtor must only pay back the same sum. If an enhancement of the coinage occurs after a contract is signed, he must not pay the present value of the coins he received, but rather the sum they represented when he borrowed them. And if the value of the coins is abated, the debtor still owes the sum borrowed. […] IX. For a loan of wheat, wine and other similar things, for which the [nominal] price goes up and down, the debtor owes the same quantity [and quality] he borrowed, neither more nor less, regardless of the rise or fall in the price. (Domat 1689, 263–4)[27]

Monetary debts require the payment of fixed nominal sums that can be completed with items of variable quantity and quality (monetary instruments or otherwise). In-kind debts require the payment of a fixed quantity of a commodity of a given quality worth a nominal sum that varies according to the price of the commodity provided at the time of payment. Both types of debt

[26] « Les monnoyes doivent être considérées par les sujets selon la marque & le prix, & selon le taux de la mise que le Souverain y donne, sans enquerir la bonté intrinsèque qui est ce que dit la loy […]. Le retrayant n'est tenu de payer en mesme fortes d'especes que l'achat a esté fait ; […] le retrayant seroit quite en baillant [des especes] […] selon la proportion de la valeur extrinseque […] que le Roy a octroyé aux unes & aux autres especes. »

[27] « VIII. Dans le prest d'argent le debiteur n'est obligé qu'à rendre la même somme : & s'il arrive après le prest une augmentation de la valeur des especes ; il ne doit pas rendre la valeur presente des especes qu'il avoit receües , mais autant qu'elles valloient quand il emprunta. Et si au contraire la valeur des especes est diminuée, le débiteur ne laisse pas de devoir la somme empruntée. […]. IX. Dans le prest du bled, du vin & des autres choses semblables , dont le prix augmente , ou diminuë , le debiteur doit la méme quantité [et qualité] qu'il a empruntée , & ny plus ny moins, soit que le prix en soit augmenté au diminué. »

involve payments with an uncertain purchasing power unless Valorism is applied in the law. By the eighteenth century, Nominalism is fully integrated in French law and influential jurist Robert-Joseph Pothier (1699–1772) notes, while citing Paulus and Du Moulin, that:

> 36. A question among jurists is, if borrowed coins must be given back on the basis of what they are worth at time of payment, or what they were worth when the contract was drawn. Our jurisprudence always states that the value of coins must be determined on the basis of their official nominal value at the time of payment. Our jurisprudence rests on this principle, that, regarding money, one does not look at the substances and types of coins, but only at the current nominal value assigned by the prince. […] From this principle, it follows that it is not the coins themselves that form the basis of a loan and other contracts, but rather the nominal value they represent. […] [A]s a consequence, […] by repaying this same nominal value, a debtor satisfies his obligation, even if the coins he tendered in payment have a lower fineness or a lower weight, or if, following an enhancement of the coinage, a small number of coins [of the same fineness and weight as he originally received] are tendered to pay the nominal sum due. (Pothier 1821, 403)[28]

In the nineteenth century, the Napoleonic Code, itself heavily influenced, via Pothier, by the Roman civil law available in the Justinian documents, states that:

> The obligation which results from a loan of money is always only the numerical sum stated in the contract. If the value of money has increased or decreased before the time of payment, the debtor must repay only the numerical sum lent in the lawful currency at the time. (Article 1895 in Rosenn 1982, 39)

[28] « 36. C'est une question entre les interprètes, si l'argent prêté doit être rendu sur le pied qu'il vaut au temps du paiement, ou sur celui qu'il valoit au temps du contrat. L'usage est constant dans notre jurisprudence, qu'il doit être rendu sur le pied qu'il vaut au temps du paiement. Notre jurisprudence est fondée sur ce principe, que dans la monnoie on ne considère pas les corps et pièces de monnoie, mais seulement la valeur que le prince y a attachée […] Il suit de ce principe, que ce ne sont point les pièces de monnoie, mais seulement la valeur qu'elles signifient, qui fait la matière du prêt, ainsi que des autres contrats. […] et par conséquent […] en rendant cette même valeur , il satisfait à son obligation , quoique la monnoie, qui a cours au temps du paiement, soit d'un moindre aloi ou d'un moindre poids, ou qu'étant survenu une augmentation sur les espèces, il en faille un moindre nombre pour faire cette valeur, que celui qu'il a reçu. »

Creditors bear the risk of debasement, enhancement, wear, and inflation, and debtors bear the risk of reinforcement, abatement, and deflation.

These legal deliberations had a major impact on economic mechanics and economic thinking. Nicholas Barbon (1640–98), in his response to Locke, notes that, domestically, business is done on a nominal basis. For "the baker, the Grocer, the Coffeeman, and all the Retailers, […] the Farmer or Merchant" (Barbon 1696, 16):

> Money is the Instrument and Measure of Commerce, and not Silver. […] [I]t is Money that men give, take and contract with for all other Commodities, and by which they estimate the value of all other things; having regard more to the stamp and currency of the Money, than to the quantity of fine Silver in each piece. (first and second pages of "The contrary Propositions in Answer to Mr. LOCK")

He gives two reasons for that. One reason is that most people have no idea how to evaluate the quantity of metal in coins and doing so inhibits trade:

> For there is scarce two Mints that agree in the Standards of their Coin. […] Besides, The Pound Troy is divided into a number of pieces differing in their weight, and that no two Mints divide their money alike. […] it will be found almost impossible for the Merchant or any one else to keep an account of the quantity of Silver in each piece of Coin. […] because the knowledge of the different Allays and fineness of Gold and Silver, is a mystery that belongs only to a small number of men that deal in it; who are either Moniers that belong to Mints, or Goldsmiths that serve an Apprenticeship to acquire skill in it. (Barbon 1696, 19–22)

The second reason is that fines require nominal payments:

> The judges in setting their fines commonly use the old Denomination of a Mark, which is the name of the Weight of Gold and Silver in most places of Europe, […] and yet the Judges by their Fine, intend no more than that it should be paid by the Current Money

> now in being, which is two Thirds of a pound Sterling by tale, and not two Thirds of a pound Troy by Weight, as the Mark signifi'd when first in Use, which would now amount to Forty shillings by Tale, instead of Thirteen and Four pence. (Barbon 1696, 31–2)

As such, "[i]t is the Denomination and Currency of the Money that men regard in Bargaining, and not the quantity of Silver" (Barbon 1696, 30). Thomas Attwood (1783–1856) makes the same point for retail transactions:

> When an individual sells either his property or labour for money, he never considers or regards at all what quantity or weight of metal the money which he obtains contains. This is not the object which he has in view. […] [P]erhaps once in ten thousand transactions, […] some individual takes into his head the notion that the metal of which his money is composed is likely to rise in value, […] Coins are not intended for speculation, but for circulation. (Attwood 1820 cited in Taylor et al. 1832, 8–9)

In the 19th and early 20th centuries, Marx, Veblen (1901, 1904), and Keynes emphasize that capitalism is a monetary economy—that is, an economy, not only where a monetary system is present, but also one in which the nominal outcome "plays a part of its own and affects motives and decisions" (Keynes 1933a [1973], 408):

> The classical theory supposes that [...] only an expectation of more product [. .] will induce [an entrepreneur] to offer more employment. But in an entrepreneur economy this is a wrong analysis of the nature of business calculation. An entrepreneur is interested, not in the amount of product, but in the amount of money which will fall to his share. He will increase his output if by so doing he expects to increase his money profit, even though this profit represents a smaller quantity of product than before. [...] Thus the classical theory fails us at both ends, so to speak, if we try to apply it to an entrepreneur economy. For it is not true that the entrepreneur's demand for labour depends on the share of the product which will fall to the entrepreneur; and it is not true that the supply

> of labor depends on the share of the product which will fall to labour. (Keynes 1933b (1979): 82–3)

More recently, Hyman P. Minsky (1975, 1986) and Paul Davidson (1972) emphasize the centrality of nominal contracts for the economic incentives that impact the allocation of resources, the organization of production, and the distribution of output. Debt services, taxes, rents, and others are set in nominal terms, which greatly impacts liquidity and solvency and so influences economic calculations of gains and losses.

In conclusion, Nominalism does not conceptualize a credit operation as a transfer of goods and services over time. Conclusions such as this are incorrect for monetary debts:

> [Money] represents Indebtedness: or services due to the owner of it: and it represents the Right or Title, which its holders have to demand some product or service in recompense for some service they have done to some one else […] the Right to demand these equivalent services when they please. (Macleod 1889, 72, 81)

The debtor does not promise to repay a nominal sum of constant purchasing power, or even any purchasing power, nor does it promise a pound of metals, or a specific quantity of products or services. The debtor only promises to provide a number of digits of unknown purchasing power that will depend "on the price-level at the time of payment" (Olivecrona 1957, 29, 126–7, 171). Similarly, the creditor of a monetary debt has no right to demand a product or service; service can be refused or changed in quantity and quality. The important implication is that creditworthiness is not judged in real terms for monetary debts, so default does not include the inability to sustain the purchasing power of what is owed. The debtor is not liable to the creditor if the debt service loses purchasing power, nor is the creditor liable to the debtor if the debt service gains purchasing power. A promise to pay is merely a promise:

> to pay a sum of money [that] contains no description of any physical object at all. […] [It] is a promise to pay a sum of ideal units. […] [Put differently,] a promise to pay money is really a promise to transfer monetary units to the other party […] [that] gives

> rise to a situation of constraint […] according to law and custom. (Olivecrona 1957, 123–4, 127, 136).

The way that a transfer of funds is done depends on the contract, the law, and the agreement between debtor and creditor; ultimately anything can be used to service debts as long as that thing is worth the nominal sum due:

> By agreement between the parties, anything might be used as a medium of payment; the creditor may, e.g., accept a used car in payment of the debt […] [or payment can be effected] by means of the transference of a monetary claim. (Olivecrona 1957, 130–1, 133)

This is not a mere legal position, this has a tremendous influence on how incentives are set in the determination of the allocation, production, and distribution of resources, and how "success" and "loss" are defined. It also influences how monetary systems are theorized and managed as shown below.

2.1.2. The Power of the Prince: Valor Impositivitius and Extrinsecæ Bonitatis

If the law follows Nominalist principles, it becomes central for coins to have a stable nominal value and the official value becomes a critical reference point. This pushed scholars away from the intrinsic quality (*bonita intrinsicæ*) of coins and toward their proper external appearance (*extrinsecæ bonitatis*), the proper stamp, proper aesthetic, and the official value assigned by the sovereign (*valor impositivitius*). In *Republic*, Plato seems to argue that coins should be made of base material, "money-token," with a nominal value set by the law. Section 2.1.1 notes that Roman legists do emphasize the role of official value for the valuation of the coinage, with Paulus being the most explicit about it. In the Middle Ages, Antoninus of Florence (1389–1459) argues that "money receives the power of the prince, through whom everyone must accept it," but a sound coin is one that has a face value equal to intrinsic value and the cost of production (Ilgner 1904, 94–5). Du Moulin follows Paulus but also notes that the sovereign cannot set the official value arbitrarily and that not all materials are suitable (see Section 2.2.5). Du Moulin, like Oresme, also argues that mutations are possible but they must be announced, transparent,

limited, infrequent and must fulfill the public purpose (Du Moulin 1547, §288, §293). For example, if the market price of the precious metal rises and the intrinsic value is about to rise above the official value, it is a wise monetary policy to lower the metal content or raise the official value from time to time in a coherent way that can be understood by the population. In addition, Du Moulin notes that the law is hard to enforce if it does not fit the needs of commerce. While the coinage is minted by the prince, it must be issued and redeemed on the basis of the needs of commerce:

> 797. […] However, Public estimation and current value do not depend solely on the edict of the Prince in a monarchy, or of the Optimates in a Republic; but also, on the consent and customs of the people, and on the customs of commerce. The laws and statutes are not binding unless verified by the common use of the bearers, as all the Doctors of law prove [...] this is especially true in the commerce of money [...]. And Guillaume Budé proves by many examples that the sense of the people prevails in these matters and makes it right. (Du Moulin 1545 [1681], 322)[29]

For example, the denier had too small a denomination for wholesale transactions and too high a denomination for retail transactions, so commerce adapted by cutting the denier into pieces, counterfeiting the coinage, issuing private or local coinage made of base metals as well as using foreign coins and doing away with coins altogether (Fletcher 2003; Burn 1853; Amato and Fantacci 2020; Sédillot 1953, 29, 34; Thornton 1802).

Scipion de Gramont (15??–1645) also emphasizes the power of the prince:

> money gets its value not from the material out of which it is made but from its form, which is the picture or mark of the Prince. […] it is not essential to the nature of money

[29] "797. […] Publica autem æstimatio & valor currens, non à solo Principis in monarchia , vel Optimatum in Republica edicto pendet ; sed etiam à consensu & usu populi , & consuetudine commerciorum . Quod si leges & statuta nisi communi utentium usu comprobata non ligant , ut omnes utriusque juris Doctores probant [...] hoc maximè verum est in commerciis nummorum [...]. Et quòd sensus populi in his dominetur & ius faciat , multis exemplis probat Budaeus. »

> to carve it in gold, silver, or copper, as we do now. […] And thus, in many places around the world, coins made of diverse material quite different from ours have nonetheless pass current at the value set by the law of the Prince or by general consent based on customs. Thus, *Numus*, that means money, comes from the Greek *νόμος* to show that it is nature that gives the substance, but only the law sets value and form. (Gramont 1620, 14–8)[30]

Barbon notes that "Money is a Value given to a piece of Metal by the Stamp of Publick Authority" (Barbon 1696, 13). Again, like Du Moulin, he notes that "that Power is limited" (ibid., 72) because face value cannot deviate too much from intrinsic value without incentivizing the act of counterfeiting. Montesquieu's *Spirit of the Law* (volume 2, Book 22, Ch. 10) also notes the power of the prince to set the nominal value and material used. Berkley goes beyond government-issued coins and notes that any issuer has the power to set the nominal value of the monetary instrument it issues, and that the stamp and signatures are the important aspects:

> 87. Qu. Whether paper doth not by its Stamp and Signature acquire a local Value, and become as precious and as scarce as Gold? And whether it be not much fitter to circulate large Sums, and therefore preferable to Gold? (Berkley 1737 [1910], 88)

Knapp makes this point more extensively in the early twentieth century:

> In modern monetary systems proclamation is always supreme. The fact that the pieces are of a given content may have all sorts of results, but it is not the basis of the validity. (Knapp 1905 [1924], 31)

The fact that a nominal value can be imposed by the sovereign, or any issuer of monetary instruments, in no way means that these authors assume that such face value is the one that

[30] « La monnoye n'emprunte point sa valeur de la matiere dót elle est composee, mais bien de la forme, qui est l'image, ou la marque du Prince […]. Ce n'est pas une chose essentielle à la nature de la monnoye de la graver en or, en argent, ou en cuivre, comme nous l'avons maintenant. […] Et ainsi en beaucoup de lieux parmy le monde on faict courir la monnoye en plusieurs autres matieres bien differentes des nostres , lesquelles neantmoins empruntent leur valeur & leur cours de la loy du Prince, ou du consentemēt general du païs puisé de la coustume, aussi le mon latin, *Numus*, qui signifie monnoye, vient du Grec *νόμος*, qui signifie loy, pour monstrer que c'est bien la nature qui donne la matiere de la monnoye, mais la valeur & la forme ne vient que de la loy. »

occurs in circulation, nor can the prince (or any other issuer) fix the purchasing power of his coins.[31] The authors above are clearly aware that purchasing power is important but they differentiate that from the question of the material used to make monetary instruments. They are also aware of the limits of fiat and that additional steps are needed to guarantee a monetary instrument circulates at its face value. This led scholars to think about the nature of monetary instruments.

2.2 The Road to Chartalism: Understanding What a Token Implies

Simply stating that a coin is worth a given nominal value will not make it circulate at that price. Some enforcement mechanisms must be put in place. For that, the thinking about monetary systems had to evolve away from mere *valor imposititius* toward understanding the financial logic at play in monetary mechanics. That means moving away from a backward-looking method of valuation used for commodities and toward a forward-looking valuation method based on expected monetary rewards for the bearers. The point then becomes to manage the expectations of bearers of monetary instruments to keep the nominal circulation value constant.

2.2.1. "Pecunia non est merx"

Given that Roman jurists followed Nominalist principles in times of economic and political stability, it is logical that they did not conceive of coins as commodities. Roman scholars such as Marcus Terentius Varro (116–27 BC), Gaius Plinius Secundus (aka Pliny the Elder) (23/24–79 AD), and later Lucius Volusius Maecianus (110–75 AD) make a distinction between coins and commodities (Lo Cascio 1996). Lucius Javolenus Priscus (around 50–100 AD) also notes that "commodities are priced in money [but] […] money is not priced in commodities" (based on the French translation in Thomas (1899, 58) of quote in *Digest*, Book 46, Part 1, §42 cited in Section 2.1.1).[32] Roman jurists also make a distinction between barter and sale, the former is an

[31] This is a (mistaken) complaint that is often found among critics who argue that this has nothing to do with economics and ignores historical facts. For example Locke (1692, 48–9): "But though in the Uniformity of its legal Worth, 100 *l.* of lawful Money being all through *England* equal in its current Value to any other 100 *l.* of lawful Money, (because by vertue of the Law it will every where pass for as much Ware or Debt, as any other hundred pounds) is capable to have its yearly Hire valued better than Land: yet in respect of the varying need, and necessity of Money, (which changes with the encrease or decay of Money or Trade in a Country) it is as little capable to have its yearly Hire fixed by Law, as Land it self."

[32] « les marchandises peuvent bien s'estimer en argent [mais] […] il ne peut s'estimer en marchandises. »

exchange of commodities while the latter involves the purchase of a commodity and so a nominal price:

> If I give money in order to get something, this is sale and purchase. But if I give a thing in order to get a thing, […] in the prevailing view the barter of objects is not sale. (Paulus in *Digest*, Book 19, Part 5, §5 in Watson (1998b, 117))

Italian legist Odofredus (d. 1265) argues that one must make a distinction between things that have intrinsic goodness and things that have value in exchange, such that the latter must have extrinsic value (Thireau 1980, 405). Cino da Pistoia (1270–1336/37) follows:

> But there are certain things for which goodness does not depend on the material, but rather on aesthetic and form, as is money, which consists in the approval of the prince. And these things have the same goodness in terms of use. (Pistoia in Thireau (1980, 405, n. 289))[33]

Estienne Forcadel (1519–78) concludes that coins, like markets, are a creature of law and that:

> Money is purposely separated from silver, because in it we look at the form and quantity rather than the material itself, and use separates it from silver, even if it is silver. Today I see that it is customary to call silver all money, even when it is made of gold. (Forcadel 1549, 149)[34]

This observation of the common use of the word "silver" as a synonym of "cash" echoes Roman jurist Ulpian who noted that "[w]e even call gold coinage 'aes.'" (Ulpian in *Digest*, Book 50, part 16, §159 in Watson (1998c, 461)).

[33] "Quaedam autem res quarum bonitas non consistit penes materiam, sed penes usum in arte et forma, ut est moneta quae consistit in approbatione principis. Et, istae res habent eadem bomtatem ex parte usus."

[34] "Pecunia consultò separatur ab argento, quia in ea formam & quantitatem potius quàm materiam ipsam inspicimus & usus eam ab argento separat, etsi argentea sit. Hodje uideo, usum obtinuisse uocandi argentum, etiam omnem pecuniam, quanuis auream."

Du Moulin, in line with Nominalism, concludes that the official value is the true intrinsic value of a coin, thereby reversing traditional vocabulary:

> 287. […] The official value assigned by the sovereign is the true intrinsic goodness of a coin, as long as it is money, regardless if it is made of gold and silver. If a coin is considered a mass, it is no longer money. (Du Moulin 1547 [1681], 393)[35]

He then concludes "Pecunia non est merx" so as long as mutations are infrequent:

> 288. […] But if it changed month to month, or year to year, […] such large and enormous tyranny and abuse would lead, firstly, the public mark on money to be a false clue and witness. Secondly, one would no longer pay attention to the public mark, and would consider coin to be a mass instead of money. (Du Moulin 1547 [1681], 393)[36]

By implementing frequent nominal mutations—that is, by constantly changing the official value of coins—the king defaults on his promise to take his coins back at the same value they were issued. Bearers lose confidence in the chartality of the coinage and so acquire the collateral and trade coins accordingly. French jurists such as Coquille and Hotman follow the same logic. Their arguments spread outside jurist circles via business practitioners, financiers, and economists. Barbon notes that:

> Some Men have so great an Esteem for Gold and Silver, that they believe they have an intrinsick Value in themselves, and cast up the value of every thing by them: The Reason of the Mistake, is, Because Mony being made of Gold and Silver, they do not distinguish betwixt Mony, and Gold and Silver. (Barbon 1690 [1905], 18)

[35] « le cours & valeur imposée à toute monnoye , est la vraye bonté intrinseque d'icelle , entant qu'elle est monnoye , soit d'or , soit d'argent. Car si on la considere comme masse, ce n'est plus la considerer comme monnoye. »
[36] « Mais si elle changeoit de mois en mois , ou d'an en an telle grande & trop enorme tyrannie & abusion seroit cause premierement que la marque publique de la monnoye seroit un faux indice & témoin. Secondement que l'on n'y auroit plus d'égard , & qu'il faudroit considerer la monnoye plustost comme masse que comme monnoye. »

> That Money differs from Uncoined Silver in this, That the Authority of the Government gives a fixt and certain value. (Barbon 1696, first page of "The contrary Propositions in Answer to Mr. LOCK")

James Steuart (Deham) (1712–80) follows in Barbon's footsteps:

> While gold and silver, therefore, pass by *denomination*, they are *money*, when they are valued by their *weight*, they are *bullion*. They are merchandise, but not money. (Steuart 1772, 6)

The anti-Bullionists were influenced by Steuart, leading them to conclude that:

> Confounding the commodity, gold, with the currency, appears to me one constant error, which pervades the works of many able writers on this subject. (Wilson 1811, 38)

By the twentieth century, the difference between a commodity and a monetary instrument is well understood. Innes goes back to Du Moulin's point that frequent nominal mutations make bearers value coins based on the collateral and so trade them as commodities:

> At times there were so many edicts in force referring to changes in the value of the coins, that none but an expert could tell what the values of the various coins of different issues were, and they became a highly speculative commodity. (Innes 1913, 386)

Knapp defines "charta" as "token" or "ticket," defined by law and makes a difference between chartality (financial characteristics and so transactions by tale) and pensatory (physical characteristics and so transactions by weight and quality):

> chartality makes the material contents of the pieces a concomitant circumstance, which perhaps may have important effects, but which is no longer essential to establish the validity of the coin. […] Chartality makes the concept of the means of payment independent of the material. (Knapp 1905 [1924] 36, 40).

Knapp notes that this applies to all types of monetary instruments, public or private, and that private bank notes are a "chartal promise to pay given by a bank […] issued privately" (Knapp 1905 [1924], 132, 134). Later, Karl Olivecrona (1897–1980) recognizes the importance of the concept of "charta" but expands it beyond what is defined by law because the state is not "the sole fountain of moneyness" (Olivecrona 1957, 51) and some "non-legal" (55) coins and notes may circulate as means of payment "without the support of any legal prescription" (54). All that matters is that they have "certain well-known characteristics" (54). Schumpeter also concludes:

> Money is not a good and not a commodity, but it is characteristically the opposite of goods or commodities. That the unit of account, with which in a pure account-settling system calculation takes place and commodities are paid for, is not itself a commodity […] is self-evident. (Schumpeter 1929 [2014], 224)

A coin is no longer conceived of as a commodity but rather as a "thing" with a constant nominal value. The question now becomes to know what that "thing" is and how a constant nominal value is enforced. This is where the idea of token comes in.

2.2.2. Monetary Instruments: What Does It Mean to Be a Token?

The idea that coins are tokens—regardless of the size of the markup—spread slowly, but an understanding of the full implications for monetary management took quite some time to develop. Two different understandings of the notion of a token emerged. The Aristotelian approach views tokens as claims on goods and services. The Platonic approach conceives of tokens as nominal claims on the issuer.

The conceptualization of monetary instruments as claims on commodities focuses the monetary analysis on the circulation phase of monetary instruments, when bearers transact to make purchases and to pay dues among each other; "to redeem" means to buy commodities. The conceptualization of monetary instruments as claims on the issuer focuses the analysis on the injection and redemption phases of monetary instruments, that is, commercial and financial transactions between bearers and the issuer; "to redeem" means to return to the issuer. For

example, a pizza coupon would not be redeemed if it circulated as medium of exchange among bearers, it would only be redeemed when tendered to the pizza shop for a pizza. In both cases, the conception of "token" is not approached along the line of the functions performed by a monetary instrument—both conceptions include the medium of exchange and means of payment functions—but rather along the line of the phases of the financial logic presented in Figure 1.

2.2.2.1. Monetary Instruments: A Claim on Commodities

The idea that monetary instruments are claims on goods and services runs from Aristotle, to Oresme, de Gramont, Boisguilbert, and Locke among others (Harsin 1928, 251–2; Macleod 1889, 67ff.). According to Harsin, this conception naturally leads to the commodity theory. This, however, confuses Valorism with the commodity theory, because, as shown below, scholars who adopt a chartal approach also argue that tokens are claims on commodities.

The use of the words "ticket" and "token" in relation to claims on goods come, to our knowledge, from William Potter's *Key to Wealth* in which he presents a scheme for a bank that can issue paper notes to compensate for the lack of coins in circulation. A monetary instrument is a "token or ticket" (Potter 1650, 38) that gives a right to commodities. At the time, as shown in the next section, he also emphasizes that the nominal value of monetary instruments is sustained by a claim on the issuer.

By the eighteenth century, the notion of a token as a claim on goods is common and transcends monetary schools of thoughts. George Berkley (1685–1753) in his *Querist* notes:

> 37. Qu. Whether Power to command the Industry of others be not real Wealth? And whether Money be not in truth Tickets or Tokens for conveying and recording such Power, and whether it be of great Consequence what Materials the Tickets are made of? […] 49. Qu. […] Whether, to facilitate these Conveyances, to record and circulate this Credit, they would not soon agree on certain Tallies, Tokens, Tickets, Or Counters? (Berkley 1735 [1910], 13, 14)

> 176. Qu. Money being a Ticket, which entitles to Power and records the Title, whether such power avails otherwise than as it is exerted into Act? (Berkley 1737 [1910], 98)

Montesquieu follows along when he notes:

> Money is a sign which represents the value of all merchandise. […] As specie is the sign of the value of merchandise, paper is the sign of the value of specie; and when it is of the right sort, it represents this value in such a manner that as to the effects produced by it there is not the least difference. (Montesquieu 1750 [1794], 37–8)

As shown in the next section, Montesquieu goes a bit further by recognizing the role of the creditworthiness of the issuer, but does not exactly define what that creditworthiness is. In the nineteenth century, John Stuart Mill (1806–73) follows valoristic principles:

> The pounds or shillings which a person receives weekly or yearly, are not what constitutes his income; they are a sort of tickets or orders which he can present for payment at any shop he pleases, and which entitle him to receive a certain value of any commodity that he makes choice of. (Mill 1848 [1909], 23)

Section 2.1.1 notes that Macleod—who developed the credit theory—follows valoristic principles by calling silver and gold coins "metallic credit" in the sense that they promise access to products. Rist (1940 [1966], 143) in the twentieth century considered an inconvertible bank note to be a "claim on an indeterminate amount" of goods and services, while a precious metal coin has a more certain purchasing power.

This understanding of tokens is inconsistent with Nominalism and daily experiences. Those who enter into debt contracts are not transferring goods over time, because debtors and creditors are not liable to compensate for changes in purchasing power. Similarly, issuers of monetary instruments do not promise that the purchasing power of their instruments will be stable over time, such purchasing power has never been stable throughout monetary history; but, at the same

time, their creditworthiness does impact such purchasing power. As such, another understanding of the nature of the issuer's promise is needed.

2.2.2.2. Monetary Instrument: A Claim on the Issuer

A different approach to the question of the nature of a token starts with Plato's statement in *Republic* that "a money-token for purposes of exchange" was created (Plato 375 BC [1875], 242). A range of Roman and medieval jurists recognize the power of the prince, as shown in section 2.2.1; however, they do not say much about how that power is implemented. Du Moulin understands "ticket/token/voucher/coupon" (*tessera*) as meaning a claim on the issuer, but is dismissive of the notion when discussing the viability of paper notes (and any other material of low value when compared to the face value):

> 799. Common sense also dictates that intrinsic goodness of matter is necessary, otherwise [a monetary instrument] could not be of use everywhere contrary to the intent of the law in place. Nowhere and in no way could it function as public money, although it could be a note or a private ticket, the use of which would be restricted to a few private persons such as in a college, where a daily or monthly stipend, or a certain amount of public money, would be given by tendering the ticket. (Du Moulin 1545 [1681], 322)[37]

The notion of redemption to the issuer is present but dismissed as unable to ensure that paper currency circulates widely at face value because, as explained in section 2.2.3.1, of Du Moulin's pessimism in the prince's creditworthiness.

A breakthrough in the understanding the notion of a token in financial terms comes from jurist François Hotman in his *Quaestionum Illustrium Liber,* first published in 1573:

[37] « 799. Sensus etiam communis ostendit necessariam esse aliquam materiæ bonitatem intrinsecam correspondentem : alioquin non posset esse usui ubique locorum, contra leg. ideo de eo, quod cert. loco. Imò nullibi nulloque modo fungi posset munere pecuniæ publicæ, licet posset esse notula seu tessera privata, cujus non posset esse usus, nisi inter paucos privatos, ut in certo collegio , quò tesseram afferendo daretur diurnum vel menstruum demensum collegii, vel certa quantitas pecuniæ publicæ. »

> It is clear, then, that Coins follow the same principles as Promissory Notes, for a promissory note is not valued on the basis of its material, that is, boards, wax, membranes, etc., it is valued by law and power when a promissory note is delivered to the pledgee […] or when it is returned to the debtor. […] And for this reason, it was argued most eloquently by the Jurists that, in money, one should look not to the body but to the power; that coins should not be reckoned among corporeal things, but instead among incorporeal things. (Hotman 1598, 97)[38]

This is an important step because he is not talking, as most will do later, about paper notes, but rather about coins, made of gold or any other material. He posits that the issuer of coins makes a promise. That promise concerns the ability to return coins to their issuer ("the debtor"), thereby introducing the relevance of the notion of redemption. Hotman opens the door for understanding what sustains the nominal value assigned by the sovereign by looking beyond the materiality of coins toward their chartality. This generalizes to all other types of monetary instruments.

In the following century, Potter notes that monetary instruments do not have to be made of gold because, as long as they are issued by someone with "firm and known credit or security" (Potter 1650, 38), they are as good as precious-metal coins. Potter's insights made the government of the Massachusetts Bay colony willing to experiment with inconvertible paper notes from the 1690s, followed by other British colonies (Trumbull 1884; Davis 1901b, 58ff.; Grubb 2008). In continental Europe, similar successful and unsuccessful experiments with the issuance of private and government notes occurred in Sweden in the 1650s, England in the 1690s, and then France in the early 1700s (Roberds and Velde 2016b; Harsin 1928). Western experiments with paper notes further led monetary thinkers to reconsider the nature of the coinage. Law and Dutot (who worked for Law) conclude that coins and notes are of the same nature:

[38] « Perspicuum est igitur, Numi eandem quam Chirographi rationem, esse non enim chirographum ex materia, id est, tabulis, cera, membranàve, sed ex jure & potestate aestimatur: ut cùm pignori chirographum traditur [...] aut cum debitori redditur […]. Atque ob eam caussam argutissime disputatum est à Jurisconsultis , in pecunia non corpus, sed potestaté spectari quinetiam numos non inter res corporales , sed inter incorporales numerari. »

> Thus, I consider an écu to be a note that has the following characteristics: "A seller will give to the bearer the commodity that he needs, for up to three livres, or for another merchandise that I have in stock" with the effigy or another public mark as a signature. (Law 1720 in Daire 1843, 674)[39]

> Fiduciary wealth is merely representative, like gold, silver, bronze, copper, leather, notes, sea shells, etc. that are used to evaluate or measure real wealth. This representative wealth is what constitutes credit […] A louis d'or, an écu, etc. are notes with the effigy of the prince as signature […] [their] purchasing power depends on the proportion between supply and demand. (Dutot 1738, 228–9)[40]

The originality of this thought comes from understanding that precious-metal coins are financial instruments and so they must obey the same rules of finance that link acceptance to the creditworthiness of the issuer.[41] In the nineteenth century, the anti-Bullionists reach a similar conclusion with Glocester Wilson (c. 1770–1850), stating that:

> The metals pass in currency only as tokens of credit, in the same manner as paper does, however their supposed value may first have introduced them there—I consider them as mere Exchequer bills; only, as it were, endorsed by the opinion of the whole commercial republick, instead of being confined to any particular exchequer. (Wilson 1811, 44)

He then generalizes to all monetary instruments:

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[39] « Ainsi je regarde un écu même, comme un billet qui serait conçu en ces termes : « Un vendeur quelconque donnera au porteur la denrée ou la marchandise dont il aura besoin, jusqu'à la concurrence de trois livres, pour autant d'une autre denrée ou marchandise qui m'a été livrée, » et pour signature, l'effigie du prince ou une autre marque publique. »

[40] "Les richesses de confiance ou d'opinion ne sont que représentatives , comme l'or, l'argent, le bronze, le cuivre, le cuir, les billets, les coquilles, etc. , dont on se sert à évaluer ou à mesurer les richesses réelles. Ces richesses représentatives formant le crédit […]. Un louis d'or, un écu, etc., sont des billets dont l'effigie du prince est la signature , […] laquelle valeur dépend toujours de la proportion entre la quantité et la demande."

[41] Daire, in commenting on Dutot's, strongly rejects the way Dutot conceptualizes coins, as would most Aristotelian thinkers: "Nothing more mistaken than the assimilation of *gold*, *silver*, *bronze*, etc. with *notes*". (« Rien de plus faux que cette assimilation de *l'or*, de *l'argent*, du *bronze*, etc., aux *billets*. » (Daire 1843, 905)).

> Mediums of currency are all of them, including specie, no less than paper; more properly designated, as simply *tokens of credit*, than as *equivalents*, or even *measures of value*, because it is only on a scale of *credit* that degrees of value can be any thing like *permanently fixed*. […] All currencies are, in my opinion, equally but tokens of abstract credit. […] Promissory notes, it is true, do but in general refer to some individual person or body. Bank notes have a broader basis in chartered or other companies. Exchequer bills still broader in the whole government. (Wilson 1811, 88, 110)

Attwood also notes that guinea coins and the notes of the Bank of England are of the same nature:

> The guinea and the bank note are, therefore, in their essential qualities, *the same;* the only difference is, that the guinea is an article of more general estimation abroad, and that the bank note has hitherto been liable to be depreciated by unseen issues between the bank and the government. (Attwood 1820 cited in Taylor et al. 1832, 7)

James Taylor (1788–1863) et al. generalize the point:

> the only essential characteristic of money is, that it possesses a power of bringing a *precise value to remembrance*; and that whether it be in the shape of a metal token, an Exchequer bill, or a bank note, is not essential. (Taylor et al. 1832, 9)

By the twentieth century, Innes concludes that monetary instruments are just one type of negotiable financial instrument and that, as such, the "*redemption of paper issues in gold coin is not redemption at all, but merely the exchange of one form of obligation for another of an identical nature*" (Innes 1914, 165). That is, the level of the money supply has not changed as redemption involved the conversion of a government monetary instrument—a convertible zero-coupon, zero-term instrument (a note)—into another government monetary instrument—an inconvertible zero-coupon, zero-term collateralized instrument (a gold coin). Coins and notes are of the same nature, a claim on the issuer:

> a government dollar is a promise to "pay," a promise to "satisfy," a promise to "redeem," just as all other money is. All forms of money are identical in their nature. […] The government stamp on a piece of gold changes the character of the gold from that of a mere commodity to that of a token of indebtedness. […] The value of credit does not depend on the existence of gold behind it, but on the solvency of the debtor. (Innes 1914, 154, 168)

This is why the sign/exterior appearance matters, bearers need to know whose creditworthiness they need to consider to estimate the circulation value of a monetary instrument:

> All coins [are] tokens and […] the weight or composition [is] not regarded as a matter of importance. What [is] important [is] the name or distinguishing mark of the issuer. (Innes 1913, 382)

As shown in Section 2.2.5, the material may still matter but it is not part of the nature of monetary instruments and precious metals can be disposed of when creditworthiness is strong.

Ralph George Hawtrey (1879–1975) also makes a distinction between gold and gold coins, i.e., gold is a commodity, while gold coins are tickets with which to discharge debts:

> A gold coin is itself a ticket; […] So long as the ticket for discharging debts can be transformed at a negligible cost into the raw material of industry, the unit represented by that ticket cannot depreciate below the value of the material which it contains. (Hawtrey 1919, 171)

As such, monetary instruments are tokens not because they promise access to a certain quantity of goods and services (this quantity is left undetermined and uncertain even when the tokens are made of precious metals) but because they allow bearers to discharge a certain nominal amount of debt:

> Bank notes and money both refer, ultimately, to articles of real value in themselves, but both leave those ultimate articles undefined, to the option of the creditor; and it is on this very account, of their *indefiniteness*, that promises are made in the first instance rather referable to either of them, than to specific articles. (Wilson 1811, 86)

Thus, purchasing power is present in the analysis, and an important component of the stability of the monetary system, but it is not part of the relation created between the issuer and the bearers but rather a general condition of stability that must be managed separately. The issuer only promises to take back its monetary instruments on demand at face value. More recently, the French Regulation school of thought has summarized all of this:

> Briefly, even when the metal content of money had a price equal to its official value, confidence in the coinage could not depend only on the weight and fineness of the metal. Confidence also depended on social and institutional processes that conditioned exchanges by defining the price of the metal […] and the relative prices of metals or their purchasing power. The causes of monetary dysfunctions are not merely monetary, and neither is the reaction of the users. (Andreau et al. 2007, 273)[42]

2.2.3 Token as a Claim on the Issuer: Creditworthiness and Acceptance

If monetary instruments are not commodities but rather financial instruments—i.e., tokens that embed a promise made by the issuer—the issuer is liable to fulfill that promise and defaults if it fails to do so. The promise is to redeem its monetary instruments, which requires understanding what redemption means and judging the ability and willingness of the issuer to implement redemption. Scholars realized that there are different levels of creditworthiness among issuers of monetary instruments and that this influences the area of general acceptance. They also realized that redemption is broader than conversion.

[42] « Bref, même quand le contenu métallique de la monnaie avait un prix égal à sa valeur officielle, la confiance ne pouvait dépendre uniquement du poids ou du titre du métal. Elle dépendait aussi des processus sociaux et institutionnels qui conditionnaient l'ensemble des échanges en définissant le prix du métal […] et les rapports de la valeur entre les métaux monnayes ou entre les métaux et les produits courants. Les causes dysfonctionnements monétaires ne sont pas seulement monétaires, et les réactions des utilisateurs, elles non plus, ne résultent pas que de tels facteurs. »

2.2.3.1 Pyramid of credit: the "strength of credit" and area of acceptance

The strength of credit in the context of monetary instruments is defined by the ability and willingness of the issuer to redeem its instruments at par on demand. As noted in Sections 2.2.1 and 2.2.2.2, Du Moulin recognizes the role that the strength of credit can play in the acceptance of monetary instruments; the population must be confident in the nominal stability of the coinage. He is especially concerned about cases where the sovereign issues a coin and abates its before tax collection:

> 290. […] The English, via an edict they published in June 1420 on behalf of Charles VI, whom they held prisoner, […] set the ecu at 60 sols tournois, the mouton d'or at 40 sols tournois and the English nobles at 7 livres tournois. In 1421, after having employed the coins at such a high price that was advantageous to them, the English revalued them to take them back at a more vile price; so much so that the Gros tournois that was worth 16 dernier tournois in 1420, was worth 4, a fourth of its previous value, and the ecu worth 30 sols tournois, and the mouton d'or at 20 sols tournois, which was half as much: Hate and contempt for the English followed. (Du Moulin 1547, 393)[43]

The population expected that coins could be returned at twice or even four times the nominal value that they ended up being able to get, thereby only reducing their tax liability by half at best because, in line with Nominalism, the tax amount due was not adjusted down to account for the abatement of the coinage. As a consequence, confidence in the coinage suffered. As explained in Section 2.2.5, the traumatic experiences with frequent, unannounced abatements shaped the view of Du Moulin regarding the relationship between the intrinsic and official values of the coinage.

[43] « lesdits Anglois , par Edict qu'ils publierent au nom du Roy Charles sixieme , qu'ils tenoient quasi prisonnier en leurs mains , […] mirent au mois de Juin l'an 1420 l'escu à soixante sols tournois , le mouton d'or à quarante sols tournois , & les nobles d'Angleterre à sept livres tournois. Et l'année ensuivante 1421 aprés que cependant ils avoient employé lesdites monnoyes à tel haut prix qu'il leur auroit pleu , les ravalerent pour les reprendre à plus vil prix ; tellement que le Gros tournois qui valoit l'an mil quatre cens vingt , seize deniers tournois , fut l'an ensuiyant à quatre deniers tournois , qui estoit au quart , & ledit escu à trente sols tournois , & ledit mouton d'or à vingt sols tournois , qui estoit la moitié moins : Ce qui fut cause qu'ils encoururent la haine & méprisement du peuple. »

Discussions about the role of issuer's creditworthiness become more prominent in the eighteenth and nineteenth centuries. Charles Davenant (1656–1714), while discussing the public debt of England, notes:

> Of all beings that have existence only in the minds of men, nothing is more fantastical and nice than Credit; it is never to be forced; it hangs upon opinion; it depends upon our passions of hope and fear; it comes many times unfought for, and often goes away without reason; and when once lost, is hardly to be quite recovered. (Davenant 1698a (1771), 151)

He then goes on to note that commerce is not done with precious-metal coins but rather via credit:

> For both before and since the war, the general Trade of this country has been more carried on by credit, than managed with the species of money. […] all great dealings were transacted by tallies, bank bills and goldsmiths notes. […] When paper-credit flourished, tallies, bank bills, and goldsmiths notes performed all the offices of money. (Davenant 1698b (1771), 442–4)

In the same vein of analysis, Montesquieu also concludes that, in his time, "public credit serves instead of mines" (Montesquieu 1750 [1794], 54). Berkley (1735 [1910], 32) states that paper notes that circulate on the strength of creditworthiness are much more convenient than coins to transact, because they are "more easily transferred, preserved, and recovered when lost." Thornton (1802) also notes that wholesale commerce dispenses entirely with precious-metal coins because of the "trouble of weighing, counting, and transporting" them; instead they use bills of credit as a financing and transaction medium as well as in settlement operations (Geva 2016). He points that some bills of credit—given their convenience and the strength of credit of their issuer—circulate at par even though they have a positive term to maturity, thereby functioning as equivalent to bank notes and being in far greater supply than both bank notes and guinea coins although their circulation is restricted to the "trading world" (Thornton 1802, 42, 43). Given the central role of creditworthiness for circulation, James Taylor also goes back to Du

Moulin's point that it is important to create confidence in the coinage. The king must not deceive people by abating the coinage between issuance and tax collection, and must promise he will accept at face value the coinage of his predecessors:

> After the first reduction above mentioned, an apprehension currently prevailed, that another would soon follow, for which cause people refused to bring provisions to the markets, chusing rather to keep them than run the risk of being cheated out of the value of the money which they might receive in exchange for them; in consequence of which, a great scarcity was presently felt. Whereupon a proclamation was issued, stating, that these effects arose "*from false and untrue rumours*, which were spread by certain lewd persons, who, of their own light heads, had imagined, that because the king had somewhat abated the value of his coin, he should, therefore, more abate it;" […] About a month after this proclamation had been issued for stopping the ears and tongues of the people, the second reduction was made. (Taylor 1828, 47–8)

> so his successor did not feel himself bound to fulfil James's pledge to take it back for taxes at the rate at which it was issued. It was, therefore, immediately cried down; the piece of money which tradesmen and others had been compelled to take for the half-crown was reduced to one penny, and the shilling to one farthing. (Taylor 1828, 56)

He also understands that the area of acceptance at par and strength of credit are linked:

> A person who signs his own name to a promissory note, issues it for what it is, viz. for his own promissory note; and, however worthless his credit is, if it circulates at all, it circulates upon the strength of that credit. (Taylor 1828, 167)

This brings up the notion of a pyramid of monetary instruments because there is a "scale of credit" (Wilson 1811, 88). The most generally accepted are instruments at the top of the pyramid. They circulate at par over a wide area, or a large "pay society" to take Knapp's expression. As one goes down the pyramid, the area of par circulation diminishes unless an instrument is

supported by issuers higher up in the pyramid. For example, the acceptance of private bank notes was greatly increased by their acceptance by the state for the payment of taxes and customs:

> At first the credit currency was in great disrepute; but as bank notes were received by government in discharge of all taxes, customs, &c. and also in payment of government loans, the same as specie, they were soon felt to be as efficient for the mere purposes of home circulation as the best metallic money. (Taylor 1828, 90)

For Knapp, bank notes are "the Chartal money of a pay-society or group which is not the State" (Knapp 1905 [1924], 145ff.), but they are integrated in the state payment system because the state uses them to make and receive payments:

> Hitherto it was only the customers of the bank who cared to use this means of payment. But now the circle of users is indefinitely enlarged. […] From that moment these bank-notes become part of the State monetary system and remain there until the State withdraws its recognition. (Knapp 1905 [1924], 137)

Innes (1914) explicitly uses the pyramid analysis:

> In America to-day, there are in any given place many different dollars in use, […]. The dollar of a first class banker is the highest standard of credit that can be obtained generally speaking, though the standard of a first class banker in a city like London or New York may be worth to a provincial banker somewhat more than his own money. The dollar of government money in America is equal to that of bank money, because of the confidence which we have come to have in government credit, and it usually ranks in any given city slightly higher than does the money of a banker outside the city, not at all because it represents gold, but merely because the financial operations of the government are so extensive that government money is required everywhere for the discharge of taxes or other obligations to the government. Everybody who incurs a debt issues his own dollar, which may or may not be identical with the dollar of any one else's money. It is a little difficult to realize this curious fact, because in practice the only dollars which

> circulate are government dollars and bank-dollars and, as both represent the highest and most convenient form of credit, their relative value is much the same, though not always identical. This apparent stability of government money in our day obscures the phenomenon which was familiar to our forefathers. (154)

More recently, scholars have expressed the same point by noting that there is a "hierarchy of money" (Bell 2001), "debt pyramid" (Olivecrona 1957), "pyramid of credit" (Murad 1954), with "gliding scale of liquidity which makes it perfectly defensible to speak of different grades of 'moneyness' in different claims" (Olivecrona 1957, 57, 65, 67).

The position that the creditworthiness of the issuer applies to all monetary instruments was at times contested among the developers of the chartal theory. For example, Davenant notes a sharp distinction between credit instruments and coins because coins are not subject to credit risk—a viewpoint that persists to this day. This distinction leads to a confusing analysis at times. Wilson (1812) argues that a paper note needs "always to return to the person who issued it" (96) while "gold in circulation has no tendency whatever towards the jeweler; […] it would obviously rather continue in circulation as currency, than quit currency for manufactures" (94), which leads him to conclude that:

> Our current silver is well known to sustain a credit considerably beyond its own value in silver, without having any distinct ostensible basis for that credit; as it does not profess to be a token, for which any one is responsible. Yet it perfectly sustains that credit. (78)

Wilson incorrectly views redemption of precious metal coins as meaning their melting by jewelers and concludes that coins are issued by no one but still inexplicably have good credit. Knapp and Nussbaum (1950) go further by arguing that inconvertible government notes are not a debt of the state because "the debts are not meant to be paid. In the case of paper money proper the state offers no other means of payments; therefore it is not an acknowledgement of the State's indebtedness, even if this is expressly stated." (Knapp 1905 [1924], 50). This view reduces redemption to conversion when Knapp and Arthur Nussbaum (1877–1964) themselves emphasize the role of tax redemption. Innes (1914) is the first to provide a coherent

generalization of the "law of debt" to all monetary instruments, regardless of their form, material, convertibility and issuer:

> Every time a coin or certificate is issued a solemn obligation is laid on the people of the country. A credit on the public treasury is opened, a public debt incurred. It is true that a coin does not purport to convey an obligation, there is no law which imposes an obligation, and the fact is not generally recognised. It is nevertheless the simple truth. A credit, it cannot be too often or too emphatically stated, is a right to "satisfaction." This right depends on no statute, but on common or customary law. It is inherent in the very nature of credit throughout the world. It is […] the right of the holder of the credit (the creditor) to hand back to the issuer of the debt (the debtor) the latter's acknowledgment or obligation, when the former in his turn becomes debtor and the latter creditor, and thus to cancel the two debts and the two credits. […] Now a government coin (and therefore also a government note or certificate which represents a coin) confers this right on the holder, and there is no other essentially necessary right which is attached to it. The holder of a coin or certificate has the absolute right to pay any debt due to the government by tendering that coin or certificate, and it is this right and nothing else which gives them their value. It is immaterial whether or not the right is conveyed by statute, or even whether there may be a statute law defining the nature of a coin or certificate otherwise. Legal definitions cannot alter the fundamental nature of a financial transaction. (160–1)

The position that coins (and inconvertible notes) do not contain any credit risk is not only incoherent with the chartal theory, but also runs counter to the past frustrations and worries of the population and monetary scholars, as expressed by Du Moulin, Steuart, Taylor and many others in this section and their discussion about tax redemption and collateral requirements (see Sections 2.2.4.2 and 2.2.5). As shown in Section 2.2.4, scholars who recognize this law of debt have a much broader understanding of the channels through which a monetary instrument is returnable to its issuer, and so a much broader conception of what creditworthiness entails and how it must be managed. The next section analyzes further the development of this thinking.

2.2.3.2 Circulation of coins at par regardless of quality

When the strength of credit of an issuer is high, its monetary instruments circulate at par within the area of influence of the issuer even if weight and fineness diverge, sometimes quite drastically. There is no direct evidence of the circulation value of Roman coins and no discussion of such a topic among Roman thinkers. Sometimes the official value is also unclear. Circumstantial evidence supports both circulation at par and discrimination in valuation but interpretations are speculative and time- and space-dependent. Over time and space, there are significant differences and changes in the Roman monetary system with spatial diversities that persisted even once "the imperial monetary system was fully unified in 296AD" (Von Reden 2010, 69ff.). The taxation system also adapted to the customs of the provinces, especially on the Eastern side of the Empire (Corbier 2008b, 362). Overall, there is a debasement of the coinage, first bronze coins during the Punic Wars, then silver coins especially 2nd and 3rd centuries AD and then gold coins in the third century (Appendix 3).[44]

Bronze coins with a face value significantly larger than the value of the bronze content, seem to have emerged in the first century BC (Crawford 1968, 3). Similar, the decollateralization of the silver coinage started in the first century AD with Nero's debasement (via both lower weight and lower fineness of the denarius), but the population protested such drastic reform so Nero had to partially backtrack by raising the fineness of the denarius from 80 to 90 percent (Andreau et al. 2007, 280; Butcher and Ponting 2005; 2014). The population was more tolerant of smaller overvaluation, with hoards of the first to third century AD showing a mix of coins of different metal standards (Duncan-Jones 1994; Howgego 1995, 130). The decline in the collateralization of the coinage increased in the second and third centuries BC and with it, enforcement mechanisms for circulation at face value had to be increased and seem to have been effective at enforcing (Elliot 2020 171–2). The Roman government relied on money changers to enforce the official values, but they charged fees to exchange and assay coins (Andreau 2015, 513; Katasari 2001, 140; Bransbourg 2013, 187, 222). In Roman Egypt, money changers and other merchants would refuse the imperial coinage, but by 260 AD, an edict forced them to accept the coinage under penalty—"although sometimes reluctantly because of its fluctuating intrinsic value"

[44] See Brown (197?), Rathbone (1996), Elliot (2014), and Butcher and Ponting (2014) for data about the debasement of the silver and gold coinage.

(Geissen 2012, 564). At the same time, tax redemption was present but it was not very efficient; fraud, tax avoidance, and corrupt tax officials were common (Corbier 2008b, 372, 374, 393), which, together with counterfeiting that was quite widespread (Andreau et al. 2007), must have impaired circulation at par. There was also a lack of awareness of the relation between taxation and the coinage among Roman monetary thinkers until the third century (see Section 2.2.4.2). Finally, the issuance of the coinage was not responsive to the demands of the economy but rather followed the needs of the state, mostly military and infrastructure spending (Von Reden 2002; Hollander 2007, 99–100, 106, 110; Duncan-Jones 1994), which at times created a scarcity of coins that made them circulate at a premium (Katsari 2011, 143–4, 147).

Overall, as long as political and economic stability prevailed, coins seemed to have circulated close to par in well monetized spaces, but the mechanics of issuance and redemption and the overall control of coinage issuance were far from perfect, allowing coins to circulate below or above parity, "sometimes in the same place at the same time."[45] As noted in Section 2.1.1, the political and economic instability of the third century—with its great epidemics, abandonment of provinces, and frequent regicides—led to a decline in a fiscal system based on monetary taxation; in-kind taxation grew to try to protect the transfer of resources from tax revenues. This is hypothesized, but not confirmed, to have generated a partial demonetization of the Roman economies (Corbier 2008b, 329).[46] The fourth century is marked by hyperinflation (see Appendix 2) and continuous weakening of the Roman Empire; the coinage circulated by weight

[45] "Official and unofficial rates existed side by side in Roman Egypt and a variety of rates are recorded in Greek cities under Roman rule, sometimes in the same place at the same time. In Rome itself, the retariffing of the *denarius* in the mid-second century B.C. became necessary when the official and unofficial rates of exchange drifted too far apart." (Crawford 1968, 3)

[46] "The collapse of the fiscal system left much economic behaviour untouched. Those with land, peasants and landlords alike, continued to get income from it. Peasants consumed much of their own produce themselves, while landlords could soon adjust rents to current prices, or express them in the more stable forms of wheat or gold or silver (by weight). There was no general reversion from a money economy to what has been called a 'natural' economy. […] In spite of temporary fragmentation, the Roman empire survived as a single political system. The strong government of Diocletian and Constantine (A.D. 284-337) restored central control; they also institutionalized the changes of the previous half-century, notably, for the present discussion, the predominance of taxation in kind. The imposition of taxes in kind throughout the empire had far-reaching implications […] In the third century, there was a decline in trade and in towns, and by the fourth century there was a definite drop in the volume of silver currency in circulation." (Hopkins 1980, 123–4)

with the political disintegration and a taxation system that moved away from Nominalism. Scheidel concludes quite generally that:

> the exchange value of coins was determined by a combination of their intrinsic—metal—value and users' willingness to accept them at their nominal value, a willingness that in turn depended on a whole range of factors such as information costs, trust, and choice, all of which were to some extent a function of state power and policies. (Scheidel 2009, 188)

What has been said of the late Roman monetary system applies in the Dark Ages and part of Medieval times, but continuous circulation at par must have become more frequent as the sovereign gained more control over the monetary system and Nominalism was applied to taxation. For example, in the eighteenth century, Adam Smith notes that the English coinage passes at face value regardless of how worn and torn it is:

> The silver coin still continues in the same worn and degraded state as before the reformation of the gold coin. In the market, however, one-and-twenty shillings of this degraded silver coin are still considered as worth a guinea of this excellent coin. (Smith 1776 [1991], 36)

Decades later, Wilson (1812, 102) made the same point and so does Taylor:

> Within the last thirty years, shillings and sixpences have been current for their *nominal* value, when, at the time, it was perfectly notorious, that their weight was not half what the law of the realm assigned to them; that if they bore only the slightest impression of being genuine coin, they were esteemed equally good in circulation whether their weight were one-third, half, or three-fourths of that assigned to them by law. (Taylor et al. 1832, 2–3)

This is true as well for the gold coinage:

> It is the theory of the present English monetary law, as we have seen that every person weighs a sovereign tendered to him. […] In former days it was not uncommon for people to carry pocket-scales for weighing guineas, and such scales may still be occasionally seen in old curiosity shops. But we know that the practice is entirely given up, and that even the largest receivers of coin, such as the banks and railway companies, and even tax-offices, post-offices, etc., do not pay the least regard to the law. Only the Bank of England, its branches, and a few government offices, weigh gold coin in England. The result is that a large part of the gold coinage is worn below the least current weight, and all persons of experience avoid paying old sovereigns to the Bank of England. Only ignorant and unlucky persons, or else large banks and companies which cannot otherwise get rid of light coin, suffer loss. […] I have met with sovereigns deficient to the extent of four to five grains, or 8*d*. to 10*d*., but they nevertheless circulate. (Jevons 1875, 111–5)

Galiani (1751 [1977], 100) also recognizes that coins did circulate at par regardless of metal quality but, like Jevons, his explanation is entirely Aristotelian. They both dismissed this as irrelevant because they argue that prices were adjusted according to quality. Economics, they argued, is about dealing with purchasing power (with the underlying assumption that a quantity of metal has a stable purchasing power) and the population and businesses were not concerned with mere nominal "illusions." However, the empirical evidence goes strongly against this position, it shows a much delayed and much less than proportional link: the depreciation of the coinage accommodated the growing financial needs of the economy while rapid inflation was driven by non-monetary factors like plagues, wars and political instability (Sargent and Smith 1997; Munro 2014; De Cecco 1985, 814–5; Corbier 2008a, 426–7; Rathborne 1996; Harper 2016, 815; Babelon 1909, 338ff.). Lo Cascio uses the lack of evidence to argue that, coins did circulate at par in Roman time; a corollary is that the price of metal is not a good proxy of the purchasing power of the unit of account:

> In fact, there seems to be no direct link between debasement and rises in the level prices, precisely because coinage was accepted as *pretium* [face value] and was not simply considered a metal ingot. Moreover, if depreciation were the answer of an aware government to a strong decrease in the supply of precious metals, and if the value of a

> coin were dependent exclusively on its metal content, there should have been no increase in the level of prices, but just an increase in the prices of precious metals. (Lo Cascio 1996, 284)

Similarly, Sargent and Smith (1997) argue that coins must have circulated at official value in medieval times because metals did flow to the Mint following a depreciation of the coinage, which means that people cared about the count; they could get more units of the unit of account with a given quantity of precious metal, even though the same nominal sum contained less precious metal (Bloch 1955, 50ff). The stable nominal value of coins in domestic circulation and the lack of price-adjustment to offset coin quality pushed scholars to study how the power of the prince is implemented, which brought to the forefront the role of redemption.

2.2.4 Redemption/Reflux: Enforcing Constant Nominal Value

As long as the intrinsic value was close to the face value, the study of redemption for the valuation of the coinage was of limited interest; the sovereign just promised to maintain the official value around the intrinsic value. The face value floats with changes in the metal price—with some of the inconveniences induced by that studied in Sections 2.1.1. and 2.2.5—or the king may decide to manipulate the intrinsic value to keep it in line with the official value. The interest of scholars in redemption channels came from monetary experiences where the intrinsic value was substantially inferior to the face value—such as the Roman monetary system in the 2nd to 4th centuries AD, the experiences with sieges in medieval times, the base coinage issued routinely by feudal lords and ecclesiastic domains from Merovingian times all the way to the seventeenth century (Sédillot 1953, 48–9), and the rise of paper notes—as well as from the development of Nominalism among legal scholars.

Simply declaring that a token must pass at a given face value will not do; bearers of the instruments have to be willing to accept that nominal value in transactions and payments. Two methods have been used to create acceptance, force and incentives. Force can take the form of physical punishment, such as branding the coin on the forehead, or public flogging, of those who refuse a coin (Taylor et al. 1832), but it is ineffective and foments resentment toward the issuer. Another way to have a forced currency is to merely issue it with no means of redemption, a mere

legal declaration that demands acceptance, which is also ineffective. Instead of force via physical threat or fiat, scholars concluded it is best to work on incentivizing bearers to accept the face value. This is where the notion of redemption, also known as reflux, enters the theoretical discussion.

Redemption via conversion turned out to be the easiest to grasp. To convert a token means to return it to its issuer in exchange for something. That something is usually conceived of as a physical reward, a pizza (in the case of a free pizza coupon), cash (in the case of a bank account), gold coins or gold bullions (in the case of a gold certificate), a coat (for a cloakroom token). Overtime, scholars figured that conversion is not the only way, nor even the main way, to redeem a monetary instrument. Indeed, redemption may also be a means for bearers to avoid legal and financial troubles with the issuer; the reward is legal because one avoids prison, bankruptcy, or worse. Force is still there but it is disguised under the veil of a public or private debt that must be honored. Monetary instruments are redeemed mostly by those who pay the debts they owed to issuers of monetary instruments; taxpayers erase their tax debts when they pay the state with its monetary instruments, mortgagors service their debts by returning to banks their monetary instruments. While this payment channel of redemption was recognized in the literature, many questioned its relevance.

2.2.4.1 Redemption via conversion

Given the prevalence of Aristotelian thinking in medieval times, the promise of conversion into full-bodied coins was the easiest channel of redemption for scholars to grasp. Tales of the widespread use of monetary instruments with a low intrinsic value reached Europe through the recollections of Marco Polo. He recounts his experiences with monetary instruments made of salt, “white porcelain shell” (cowry) and bark. For example, Marco Polo states that in the Chinese province of Kain-du:

> There are salt springs, from which they manufacture salt by boiling it in small pans. When the water has boiled for an hour, it becomes a kind of paste, which is formed into cakes of the value of two-pence each. […] On this latter species of money the stamp of

> the grand khan is impressed, and it cannot be prepared by any other than his own officers. (Pisa and Polo 1300 [1854], 259)

European scholars were skeptical of Polo's tales. It is, in part, the experiences with war financing that showed medieval European scholars that the issuance of emergency coins made of base material was possible as long as they were convertible.[47] Andreas d'Isernia (1230–1316) notes that common materials had been used in cases of emergency to meet fiscal needs but a promise of conversion should be made, and Matteo d'Afflitto (1447–1523) repeated the same argument (Sargent and Velde 2003, 98). Budel (1591, 8) notes that paper currency ("Chartaceam monetam") as well as leather coins had been used during exceptional circumstances. However, d'Afflito lamented that conversion was not implemented:

> Alas! How many princes have been damned because of this, and indeed we have seen in past wars many men destroyed because they sold their goods for vile money, namely the new copper pennies; and after the peace was made those pennies were worth nothing, and men were left with them. (d'Afflitto in Sargent and Velde 2003, 98)

One example that keeps resurfacing among scholars is the case of leather coins that were issued by Frederick II, Roman Emperor and king of Sicily, in 1240.[48] This is Hotman's presentation of the case:

> The length of the Italian war exhausted the coffers of Emperor Frederick II so he ordered the minting of a leathern coin and assigned a price to it, or, as we commonly speak, he set the value of the gold Augustalis. He decreed such price should prevail in all purchases and sales made among his subjects. Simultaneously, he gave orders to be issued by a

[47] Jevons (1875, 203–4) mentions a similar case in Ancient Greece: "In the book on Economics, attributed to Aristotle, we are told that Timotheus the Athenian persuaded the soldiers and merchants to receive copper money in place of silver, promising to exchange it for silver coins at the close of the war."

[48] Gramont (1620, 16) argues that Frederick II imitated Numa Pompilius (the possible second king of Rome). Sargent and Velde (2003) provide other examples but are skeptical about the case of Frederick II given the lack of evidence for it. For a compilation of many reported cases of monetary instruments made of leather, see Charlton (1906).

> herald that, at the end of the war, whoever brought leather coins back to the Imperial Chamber would receive a golden Augustalis. (Hotman 1598, 96–7)[49]

This experience, among many others, put redemption via convertibility on the radar of scholars to explain why bearers circulate the coinage at par regardless of the material quality of the coinage. Budel, contrary to Du Moulin (see Section 2.2.5), comes to accept Butigella's conclusion of the irrelevance of the material by understanding the relevance of a promise of redemption via conversion:

> It is an undisputable fact [that] […], the Prince, pressed by the urgent necessity of war, could make a currency out of leather, bark, or salt, or any other material, should he promise to redress the loss caused to the community by exchanging it later for a good and better currency, as Andreas d'Isernia and Matteo d'Afflito have shown […]. This is why Butigella [….] says that a coin of lead, or even of leather, may be made, in such a way that it is publicly approved in exchange for any other, whether gold or silver. (Budel 1591, 7)[50]

While conversion came more naturally as a means of bringing the circulation value of a monetary instrument to its face value, medieval scholars came to understand that other redemption channels exist, especially as the diversity of the forms of monetary instruments extended beyond metals. With that realization, conversion conceptually becomes a sufficient, but not necessary, means to hold parity over a specific area.

2.2.4.2 Redemption via taxation

In the third century AD Rome, as face value became more detached from intrinsic value, scholars became aware of the relation between taxation and coinage:

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[49] "Nam cum imp. Fridericus II propter exhaustam diuturnitate ltalici belli pecuniam, coriaceam monetam cudi iussit, pretium ei, siue, ut vulgo loquimur , valorem aurei Augustalis imposuit: statuitque vt eo pretio abomnibus in emendo vendendoque someretur: simulque per praeconem edici imperauit, bello finito qui hanc monetam ad Cameram Imperialem referret , aureum Augustalem recepturum."

[50] "Ego verò pro indubitato habeo, Principem bellis ingrauescentibus, & necessitate ita urgente, vel ex corio, cortice, aut sale, aliáve materia quauis monetam ordinare posse, si modò damnum per hoc Communitati illatum posteà per bonam melioremque monetam resarcire studeat, per Andr. de Isern. & Matthæ. de Afflict. […]. Hinc est quod Butigell. […] dicat, posse plumbeam, vel etiam ex corio facta monetam, modò publicè sit approbata pro quacunque alia, siue aurea suie argentea solui."

> at the end of the third century, with the monetary and fiscal reforms of Diocletian, there begins to be an awareness of the link between coinage and taxation and, in what seems like an extraordinary innovation, the liability of all the inhabitants of the empire, including Italians and senators, to the direct property tax. Contemporaries indeed complained more about taxation and the census than about inflation. (Cobier 2008b, 392).

Howgego also notes the role of tax redemption for the Roman coinage:

> 'Old' coin flowed back to the state, principally through tribute or taxes, rents of public land, fines, confiscations, gifts, and bequests. The state might then put that 'old' coin back into circulation through expenditure, if it did not choose to restrike it. (Howgego 1995, 92)

As noted in Section 2.2.3.1, Du Moulin understands that the strength of the credit of the English government depends on its ability and willingness "to take [coins] back" in tax payments at the same face value that it had issued them. And indeed, feudal lords commonly issued coins made of base metals that circulated at face value within the local fiefdom and were received by the lords in tax payments (although such taxes were limited and small). This system was relatively stable from the ninth to the thirteenth century with periodic mutations that received the approval of monetary thinkers of the time (see Section 1.1) and of the local population (Sédillot 1953, 34):

> The feudal conception of money was in harmony with the social context. The fiefdom was a closed world until the 13th century […] where strangers, Jews and Lombards, were exclusively involved in foreign trade and foreign exchange operations and profited from banking operations that exploited mutations. This was, actually, one of the weak points of the feudal conception of money, but it only became dangerous after Saint Louis. Until then, given that the fiefdom was self-sufficient and the prince jealously protected its borders, there was no inconvenience in issuing, for use within the estate, a bad and conventional money, that is, with an artificial and inflated value. This bad money, being forced, was received everywhere within the limits of the fiefdom, for the payment of

> fiscal dues, salaries and merchandises. Until the beginning of the 14th century, only frequent or rapid, unannounced mutations caused troubles. (Babelon 1909, 338–9)[51]

However, medieval scholars doubt that a tax-driven currency made of base material can work at the kingdom level. Butigella argues that it is possible but most medieval scholars are skeptical. Du Moulin argues that paper notes are just for "child's games" and will only circulate in a very restricted area (see Section 2.2.5). Most medieval scholars do recognize the possibility of taxation but see the sovereignty of the king as too weak to apply taxation effectively to the entire kingdom, whereas feudal lords have more ability to use and manage that taxation power given the limited size of their fiefdom. As the taxation ability of the sovereign and his control over the monetary system grew from the 13th and 14th centuries (Redish 2000, 69; Sédillot 1953, 33ff; Eagleton and Williams 2011, 65), scholars became more willing to consider taxation as a relevant means of redemption.

The overall positive experiences with inconvertible notes in the seventeenth century—such as those of the Sveriges Riksbank, the governments of the North-American British colonies, and the Bank of England (Roberds and Velde 2016b; Grubb 2008)—further made European scholars incline to consider taxation as means of promoting monetary stability. Barbon emphasizes the role of legal tender law, that is, "by the Authority of the Government [a coin] is made current and lawful Money, and every body is oglig'd to take it […] for the same Value" (Barbon 1696, 28), but also notes that taxation is an effective means of sustaining its circulation value to its face value:

[51] « La conception de la monnaie féodale était en harmonie avec l'état social lui-même. La seigneurie fut, jusqu'au XIIIe siècle, un monde fermé […] où des étrangers, Juifs et Lombards, pratiquaient le seul commerce extérieur qui existât, gagnaient à faire le change des monnaies, se livraient à des opérations de banque dans lesquelles les mutations étaient habilement exploitées. Ce fut là, d'ailleurs, l'un des écueils de la conception féodale de la monnaie, mais il ne devint réellement dangereux qu'après saint Louis. Jusque-là, le domaine de la seigneurie étant fermé et, le prince veillant jalousement sur ses barrières, il n'y eut pas un grand inconvénient à émettre, pour l'usage restreint de la seigneurie, une monnaie conventionnelle et mauvaise, c'est-à-dire à valeur factice et surfaite. Cette mauvaise monnaie, ayant cours forcé, était reçue partout, dans les limites de la seigneurie, pour le payement des redevances au fisc aussi bien que pour le prix des salaires ou des marchandises. Jusqu'au début du XIVe siècle, seules, les mutations, surtout quand elles étaient trop fréquentes ou trop brusques, non annoncées à l'avance, occasionnaient des troubles. »

> And if there were no other obligation from the king's Stamp than to Show that the king would take it in his Revenue, it would give it a sufficient currency, tho' there were no Law to make it current. […] It is the currency of the Coin that men regard more than the quantity of Siver [sic] in it. (Barbon 1696, 28–9)

Johann Gottlieb Fichte (1762–1814) recognizes the role of taxation for the acceptance of the state government monetary instruments for a closed economy:

> A closed trading state, whose citizens have no direct dealings with foreigners, can turn absolutely anything into money, as long as it declares that it will only accept payment in this money and only in very little else. [...] This would create a national currency, in which it would not even be a question of whether it would be accepted abroad or not, since for a closed trading state, foreign countries are practically non-existent. Such a state must be able to be sure that its national currency cannot be counterfeited, that absolutely no other person or power can produce it except itself. […] The state collects its taxes in money in order to ensure the general validity of the national currency. It therefore pays public officials in money in the amount it receives from the citizens. (Fitchte 1800, 433, 439)[52]

Forstater (2006) reviews the role of taxation among classical economists, some of them, such as Adam Smith, mention it in passing while others devote more time to the case and conclude like John Stuart Mill that:

[52] "Ein geschlossener Handelsstaat, dessen Bürger mit dem Ausländer keinen unmittelbaren Verkehr treibt, kann zu Gelde machen, schlechthin was er will , wenn er nur declarirt, dass er selbst nur in diesem Gelde, und schlechthin mit kleinem anderen sich werde bezahlen lassen. [...] Hierdurch entstände ein Landesgeld : bei welchem es auch nicht einmal in Frage kommt, ob dasselbe im Auslande werde genommen werden, oder nicht; indem für einen geschlossenen Handelsstaat das Ausland so gut als gar nicht vorhanden ist. Nur muss ein solcher Staat sicher seyn können, dass sein Landesgeld ihm nicht nachgemacht werden könne, dass schlechterdings kein anderer Mensch, und keine andere Macht es zu verfertigen vermöge, als er selbst. […] Der Staat erhebt seine Abgaben in Gelde, um dem Landesgelde die allgemeine Gültigkeit zu versichern. Er besoldet daher die öffentlichen Beamten in dem, was er von den Bürgern erhält, in Gelde." (Thanks to Jan H. Prokott who pointed to me this and other German authors who recognized tax redemption before Knapp).

> After experience had shown that pieces of paper, of no intrinsic value, by merely bearing upon them the written profession of being equivalent to a certain number of francs, dollars, or pounds, could be made to circulate as such, […] [Governments] determined to try whether […] {to] make a piece of paper issued by them pass for a pound, by merely calling it a pound, and consenting to receive it in payment of the taxes. And […] they have generally succeeded in attaining this object: I believe I might say they have always succeeded for a time, and the power has only been lost to them after they had compromised it by the most flagrant abuse. […] The quantity of a paper currency not convertible into the metals at the option of the holder, *can* be arbitrarily fixed; especially if the issuer is the sovereign power of the state. The value, therefore, of such a currency, is entirely arbitrary. (Mill 1848, 88–9)

By 1832, Thomas Smith is also more inclined to see taxation as a relevant redemption channel, but one has to wait until the work of the Taylor brothers, John (1781–1864) and James (1788–1863), and other anti-Bullionists to see an emphasis on the role of taxes in monetary history. John Taylor embraces the analysis of Paulus and notes that Apostle Matthew, who was a toll collector, called a coin a "token of tribute" or "token of [tax] receipt." John Taylor (1833) notes:

> *Coin* is an article of great antiquity and importance; but in all ages and countries its origin has been *taxation*. Like *symbolic* money it is an *instrument of taxation*, and a *token of receipt*, but with this wide difference between them, that coin has *some intrinsic value*. (32)

Jonathan Duncan, the younger (1799–1865) states something similar:

> They were tokens of the fiscal relations that existed between the rulers and the ruled. They enabled the former to make their purchases readily and without waiting for the receipt of revenue; while they enabled the latter to discharge their taxes or tribute in an instrument which they had, no great difficulty in procuring. (Duncan 1849, 4–5)

The same fact holds during the Middle Ages with taxation in coins being a core mechanism of monetizing the economy (Taylor 1828). As such, coins were not issued "for the *sole* purpose of paying tribute, but also for the *additional* purpose of enabling the government to ANTICIPATE its payment; and it is probable that the latter was, with the government, the *stronger* reason of the two." (Taylor et al. 1832, 13)

Jevons also notes that inconvertible paper notes were successfully issued if the government accepted them as a means of tax payment:

> There is plenty of evidence to prove that an inconvertible paper money, if carefully limited in quantity, can retain its full value. Such was the case with the Bank of England notes for several years after the suspension of specie payments in 1797, and such is the case with the present notes of the Bank of France. (Jevons 1875, 232)

However, he is afraid of the incentive that paper notes give to governments to spend carelessly because the material is too easy to procure (235).

Knapp is probably the most well-known modern scholar to emphasize the role of taxation in the acceptance of government monetary instruments and in the widening of the general acceptance of private instruments. He notes that convertibility is not a requirement for the valuation at par of private or government monetary instruments (Knapp 1905 [1924] 175–6). As noted in Section 2.2.3.1, Innes (1914) argues that tax redemption is an implicit promise of the king even if it is not in the law, that is, the population expects to be able to use coins to pay their taxes:

> This, then—the redemption of government debt by taxation—is the basic law of coinage and of any issue of government "money" in whatever form. It has lain forgotten for centuries, and instead of it we have developed the notion that somehow the metallic character of the coin is the really important thing whereas in fact it has no direct importance. We have grown so accustomed to paying taxes or any other debt with coins, that we have come to consider it as a sort of natural right to do so. (161)

Starr (1974) integrates the role of tax redemption in a general equilibrium model to give a non-zero price to monetary instruments.

Authors who recognized tax redemption are also conscious of limits in implementing it. Du Moulin and Taylor (see Section 2.2.3.1.) note that the king should avoid fooling people by changing often the official value of its coins. There also needs to be some continuity in terms of tax redemption from one sovereign to the next to create confidence in the coinage and so to foster a general willingness to circulate it at face value. Unfortunately, there are numerous cases of default. For example, Rathbone (1996, 338) notes that the frequent "retariffings of the token 'silver' coinage destroyed its credibility; in the fourth century there was a public and private tendency to revert to an economy in kind and, for the powerful, in gold." Innes notes the frequent mutations of the coinage led to its treatment by the population as a speculative commodity (see Section 2.2.1).

Another important aspect of tax redemption, for nominal stability, is that the issuer should be indifferent about the type of monetary instrument it receives back in tax payment. A government ought not to limit the ability of the population to pay their taxes in notes or coins to a certain proportion or a certain nominal amount. For example, Harsin notes that the first French government notes issued in 1706 were legal tender for private debts in Paris only and confidence in the notes fell as the population came to realize that they would not be accepted for tax payments (Harsin 1928, 91–2). The French population did not know what the notes were good for, so they circulated at a 72 percent discount in 1715 (121, 134). The French government refused notes because it wanted people to pay their taxes in coins (121). When he receives coins, a sovereign should not weigh the coins it receives back in payment to determine at what price to redeem them, although it ought to check for counterfeit and refuse them which may involve weighing and assaying the coinage. If a coin is merely worn or clipped, it should be accepted at par by the government. Failure to do this will make people care about the metal content of the coinage for tax payment and so the circulation value of the coin will be impacted as the population trades underweight coins at a discount and mistrusts official values. Bloch (1955, 30) notes that, in the Middle Ages, people distrusted coins and tested their material quality through weighing and assaying. This can be explained by the concrete mind of agrarian societies, as

Bloch argues, but also by the Metallist tax practices of the king that incentivized the population to care for metal quality of the coinage. For example, in twelfth century England, the king required periodically assaying of pennies in bulk[53] and demanded that tax sheriffs to come up with the number of unblemished pennies added by mint officials to balance the scale. Another tax practice, given that melting coins was time consuming, was to apply a blanket five-percent discount to any sum received from sheriffs. Sheriffs anticipated such extra payments by collecting coins at a discount relative to their official value (Bolton 2012, 47).

If the government is interested in the metal, the government must either buy it at market price, incentivize inflow of metal to the mint by changing the mint price, or find a way to control its supply via taxation, requisition, monopolization of mining, or other means that do not involve discriminating among monetary instruments returned for tax redemption.[54] Taxation is one of the means available to obtain the material needed to make coins; it is not a means to balance the budget. In the Middle Ages, when taxation ability was weak and the population disliked direct taxation, an alternative was to debase the coinage to offset the limited quantity of the necessary material. The population was more tolerant and less aware of smooth periodic debasements, which provided a quick means to produce more coins to meet the fiscal needs of the king. At the same time, frequent or rapid debasements were also disliked by the population and creditors preferred a stable metal content so the king had to find other means to get the necessary material. A successful political compromise allowed taxation to grow in exchange for the king's promise to refrain from debasing to meet fiscal needs (Desan 2014, 160; Allen 2016, 48; Babelon 1909, 325–6, 337–8). A stronger tax system helped maintain the metallic stability of the coinage but also emphasized the "fiscal value of money" (Desan 2014, 48) over its intrinsic value, which was consistent with Nominalism. England was more successful at such compromise than sovereigns

[53] Precise scales were expensive and minting techniques were imprecise (and so the coins produced out of a pound of sterling silver were not uniformed in terms of weight and shape) so metal content was checked by assaying coins in bulk. To do so, 240 pennies (the mint equivalent at the time) were melted into an ingot that was weighed against a Tower pound of standard silver (about 350 grams of sterling silver). Fineness could also be tested by using a touchstone but medieval touchstones could not detect decline in fineness of less than 5 to 10 percent (Munro 2014); their accuracy improved to 1 percent by the nineteenth century (Redish 2000).

[54] For the Roman empire, the main source of metal was the tribute and pillages from new conquests. As the empire stopped expanding, other means had to be used to get the necessary metal, such as requisition and taxes, or debasement had to occur to offset the metal scarcity.

of continental Europe (Desan 2014, 162) and so performed milder debasements compared to continental Europe, but debasements still needed to occur to preserve the coinage (avoid melting and exporting).

A third crucial aspect for nominal stability is that there must be a tax redemption mechanism that is reliable and efficient; low political capital, inadequate record keeping mechanisms, tax evasion, a large informal economy, and corrupt tax collectors all make collection difficult, which weakens the ability of tax redemption to sustain parity in circulation. In the Roman Empire, there is ample evidence of routine "predation, fraud and abuse of power at all levels of government, including among officials in charge of prices, weights and measures" (Elliot 2020, 150). Scholars who emphasize tax redemption want a very strong redemption channel and, as shown below, anti-Bullionists are all fiscal hawks. James Taylor blames the failure of the assignat on the absence of tax or conversion redemption mechanisms:

> The assignats were an irresponsible issue of paper money capable of being carried to any excess, and having no immediate reference to the taxes, for which indeed it was not sure they would be taken by the power which issued them, still less by that which, in its turn, might succeed to the government. (Taylor 1842, 73)

> There the government issued *assignats*, or promissory notes representing the national taxes, without any restriction as to the amount, and without any intermediate party being responsible for converting them into the coin of the realm on any terms; and the necessities of a profligate government prompted the rulers to issue those *assignats* to an extent far beyond the power of the national revenue to redeem them. (Taylor 1855, 12)

Finally, there must exist enough monetary instruments in circulation to pay the tax obligations that must be paid with monetary instruments. This is a recurring problem in monetary history, not only terms of inadequate supply of monetary instruments (Corbier 2008b, 351; Taylor 1828; Sargent and Velde 2003), but also in terms of the lack of monetization of the economy (Corbier 2008b, 374; Katsari 2011, 149–150; Hollander 2007, 95–7).

3.2.4.3. Redemption via Bank Debt Collection: Forced vs Free Paper

The unsuccessful French experiments with paper notes in the eighteenth century (i.e., the mismanaged issue of paper currency in Paris in the early 1700s, the debacle of the Law System in 1720, and the mismanagement of the assignats and mandates at the end of the eighteenth century) negatively influenced the views about government paper notes for the following centuries. This led later scholars to differentiate between "forced paper money" and "free paper money" that brought forward the role of bank debt-service as a redemption channel. The distinction finds its root in John Law (1671–1729) when he defends forced paper notes:

> Commoners are of the opinion that the creditworthiness of a note is sustained and preserved by the freedom to accept or reject it; on the contrary, I believe this freedom foments doubts about creditworthiness and limits its circulation. […] Instead, if everyone was forced to take it, it might never return, and so its issuer would never be required to redeem it. […] All public credit, even precious metal coins, rely on [forced credit] to circulate, as magistrates have often been needed to force some individuals to accept specific coins or to accept them at a specific value […]. It is this constraint that creates public confidence, because nobody would accept a coin, or a note, that someone else would be free to refuse. (Law 1720 [1851], 630–1)[55]

Law believes that legal tender laws (understood narrowly as laws about final means of settlement of private debts, given that he favors a forced currency and so does not include tax payment in legal tender laws) were enough to ensure that monetary instruments would circulate at face value. As long as the individuals is forced by judges to settle debts they owe each other by circulating monetary instruments at their official value, Law believes the government coins and notes never have to return to the government to sustain their face value. All scholars who follow

[55] « Le commun des hommes ne manquera point de dire là-dessus, que le crédit d'un billet particulier se soutient et se conserve par la liberté de l'acceptation; et moi je soutiens, au contraire, que le crédit de ce billet n'est douteux, et sa circulation bornée, que parce que l'acceptation en est libre. […] Au lieu que si tout le monde était obligé de le prendre, il se pourrait faire qu'il n'y revint jamais, et qu'ainsi son auteur ne fût jamais obligé de le payer. […] L'argent même en a besoin [du crédit forcé] pour circuler, et l'on a été obligé plus d'une fois de recourir au magistrat pour faire accepter à quelques particuliers certaines espèces, ou les espèces sur un certain pied. C'est cette contrainte même qui fait la confiance publique, puisque le commun du monde n'accepterait jamais une monnaie, ou un papier, que quelqu'un serait en droit de refuser. »

disagree with this conclusion, and assert that at least one redemption channel is necessary, but it is a matter of finding which one(s) is(are) the most apt to work in a given institutional context.

Skepticism about the tax redemption of monetary instruments with a low intrinsic value starts with Du Moulin (Section 2.2.3.2). Steuart is also skeptical. Curiously, he takes the case of the British colonies in North America:

> A system of paper credit, similar to that established in the colonies of North-America, where the paper is issued upon no other security than the bare promise of the colony to make it effectual, with an obligation to receive it in payment of their taxes; but without providing any fund to pay upon demand, either the capital contained in the note in specific coin, or even an interest corresponding to the sum during the delay of payment, is so defective a scheme, and one so liable to great objections, particularly to that of gradually debasing the value of their money of account, that I never can recommend it to the imitation of any trading nation. (Steuart 1772, 76)

Steuart then explains why the credit of the English government is poor: taxes are too low relative to government spending, quantity and quality of the coinage is poorly controlled, and "people were unaccustomed to taxes" (Steuart 1767b, 363).

On the contrary, bank notes issued against the discounting of commercial bills are sound because bills are an old and routine means to finance economic activity and are redeemed quickly:

> the greatest part of the notes of the Bank of England must return to it in less than sixty days; because they are issued *upon the discount of bills*, not exceeding that term. The notes of the Scotch Banks, *issuing upon permanent obligations*, may not return in many years. They accumulate therefore to a great sum, although they may at a particular time come upon the Banks all at once. (Steuart 1772, 75)

Early in the Bullionist controversy, Thomas Smith (1807) is the first to use the difference between forced and free notes:

> The two kinds of Paper Money, proposed to be described, may be distinguished by the appellations of Forced and Free. […] By Forced Paper Money is meant, [“]that Paper Currency which is forced upon the People of a Country, and which they are obliged to take, whether they will or not; [”] […]. This can only be done by People in power, and, therefore, all Forced Paper has been issued by sovereign powers. […] French Assignats are [a] very complete example of *forced* Paper Money. […] By Free Paper Money is to be understood, “that Paper Money which is issued by individuals, or public bodies, at the request and desire of the people of a country themselves, in order to supply the deficiency of a Circulating Medium in that Country.” (37–49)

Free paper notes are issued and redeemed with the needs of commerce:

> At length it occurred to [dealers in exchange bills] to say [to merchants issuing bills]: "We will give you, in return for these bills, our own promissory notes for a small proportion of the Standard unit of the country, which will pass for a Circulating Medium, and when the bills become due, we will take these promissory notes back in payment." This appears to have been the legitimate foundation of banking, and of the issuing of Bank Notes as a Circulating Medium. (Smith 1807, 52)

Robert Torrens (1780–1864) notes that, in addition to conversion, the servicing of bank debts “is an effectual means of returning all the superfluous paper upon the bank that issued it, and of bringing the supply of circulating medium within the measure of the demand” (Torrens 1812, 125). Thomas Smith states that conversion is not a requirement for free paper notes, Bank of England notes were free paper notes even when they were inconvertible, redemption through taxes and debt services are sufficient to ensure general acceptance:

> The obliging banks to give specie for their notes is a useless regulation. […] When the bills discounted, or the taxes on which the advances have been made, become due, then the notes which have been advanced, are returned in payment. (Smith 1832, 45, 60)

He does classify government notes among free paper notes as long as they can be redeemed for tax payments without restriction. However, he is skeptical about the ability of tax redemption to be significant, because taxes are too low and the government discriminates among its instruments during tax payments. He also wants a clear separation of fiscal and monetary powers because past experiences with forced paper notes "[have] left a prejudice in the public mind" (Smith 1832, 50):

> Paper money has no intrinsic value; it is only an imputed one; and therefore, when issued, it is with a redeeming clause, that it shall be taken back, or otherwise withdrawn, at a future period. Unfortunately, most of the governments, that have issued paper money, have chosen to forget the redeeming clause, or else circumstances have intervened to prevent their putting it into execution; and the paper has been left in the hands of the public, without any possibility of its [sic] being withdrawn from circulation. (Smith 1832, 49)

A forced note is not issued according to the needs of the private sector, but rather for the emergency needs of the government that has no "means of retiring it from circulation when found requisite" (Smith 1811, 83).

William Huskinsson (1770–1830) makes a similar distinction by stating that "[o]f paper currency […] there are two sorts ; the one resting upon confidence; the other upon authority" (Huskinsson 1810, 3), the first one he calls "paper credit" and the second "paper money." Thomas Tooke (1774–1858) and John Fullarton (1780–1849) follow along: "Whereas the bank-notes are only *lent*, and *are returnable to the issuers*," (Fullarton 1844, 66), government notes are "not […] returnable to the issuer" (Tooke 1844, 69) because "no precaution is usually taken to ensure its being ever returned again into the Exchequer" (Tooke 1848, 180). Tooke qualifies this slightly:

> A part, which is generally a small proportion, may, indeed, be returnable in payment of taxes; but the Government may immediately re-issue the amount so returned, and then keep up or extend the quantity, according to its own purposes. (Tooke 1848, 186).

Thus, the anti-Bullionists and Banking School proponents do not say that tax redemption is not possible but rather, like Steuart, that it is a weak channel because of a lack of incentive for a government to implement the necessary tax collection to redeem the notes. On the contrary, banks are driven by the profit motive and so have an incentive to collect bank debts, which ensures the redemption of bank notes. As such, contrary to Steuart who argues that all notes are based on credit, Tooke concludes that "[d]iscredit is not an essential element in variations of the value of an inconvertible paper" (Tooke 1848, 177). Paper notes have no creditworthiness that sustains them, government forces them onto the population that is then stuck with them.

Tooke and other members of the Banking School call the "law of reflux," the redemption channels that exist for bank notes. They identify three channels, conversion into bank accounts, conversion into coins, and servicing of bank debts (See also Fullarton 1844, 67–8, 78–9, 94–5):

> The *law of reflux*. This law operates in bringing back to the issuing banks the amount of their notes, whatever it may be, that is not wanted for the purposes which they are required to serve. The reflux takes place chiefly in two ways: by payment of the redundant amount to a banker on a deposit account, or by the return of notes in discharge of securities on which advances have been made. A third way is that of a return of the notes to the issuing bank by a demand for coin .The last seems, in the view of the currency theory, to be the *only* way by which a redundancy, arising from the unlimited power of issue, which they assume to exist, admits of being corrected in a convertible state of the paper. It is certainly the one least in use. (Tooke 1848, 185)

Charles Moran (1811–95), a banker, repeats something similar:

> Whenever bank notes shall cease to be redeemable in coin on demand, they will be freely issued to those who will pay interest for them and furnish ample security for their return within a specified time. The return of bank notes in repayment of loans is an ample and proper means of redeeming them, and will always prevent the currency from becoming redundant. (Moran 1863, 228)

Economic units freely choose to become indebted to banks. Then, debtors must pay the principal due, which redeems some of the bank notes originally issued, they must also pay the interest due by returning an extra quantity of bank notes.

Scholars who emphasize band-debt redemption channels go too far by arguing that redemption makes it impossible to have too much bank monetary creation as long as banks are focused on short-term credit. The real bill doctrine proponents argue along that line. Among their opponents, the Bullionists argue that the interest rate is a major regulator of bank credit, and government officials emphasize the quality of the underwriting instead of the length of credit; government regulations and market forces provide a check on unsustainable issuance of credit (Viner 1937, 151). Much later, Hyman Minsky (1919–96) emphasizes the role of underwriting quality with his distinction between hedge, speculative, and Ponzi finances (Minsky 1975, 1986). He also emphasizes the role of redemption via bank-debt payments as a core reason for the acceptance of bank monetary instruments:

> Why is 'bank money' accepted? […] The answer comes in two steps: any bank dollar is convertible at par into any other bank dollar, and a significant set of units are committed to earn bank dollars in order to fulfill their obligations on debts that are owned by banks. Bank dollars are valuable because units are operating in the economy to get bank dollars so they can pay bank debt, and in the process destroy bank dollars. (Minsky 1985b, 16)

3.2.4.4. A Synthesis

Ultimately scholars do integrate all types of redemption, especially as tax imposition and collection mechanisms become more established and efficiently implemented:

> That the *only* essential characteristic of money is, that it possesses *admonitory* value, which admonitory value may be given to it by a government, a landlord, or any other *receiving* party who is entitled, by authority or agreement, to make a specific demand upon another party who has to *pay*. (Taylor et al. 1832, 22)

Duncan (1849) also generalizes the channels of redemption to any type of issuer, banks, government, or any other entity able to impose dues on others and to make them pay with its monetary instruments:

> We divide Symbolic Money into two kinds—The Money of the State, and the Money of Commerce […] The Money of the State should be issued […] in payment of the several obligations of the government […] [and be] pleadable in to the Exchequer for the discharge of taxes, the government taking [it] back from the people at the same value at which [it was] issued. […] We proceed to the Money of Commerce. As the Money of the State grows out of the necessities of the government, so the money of commerce grows out of the necessities of merchants, manufacturers, and traders. […] Joint-stock Banks should issue the money of commerce, of which the Scotch banks are perfect models. (11–2, 14–5)

Mill (1848, 82), like Fullarton and Tooke, notes that bank accounts are more important in domestic transactions than banknotes and bills of exchange, but redemption works in a similar fashion in all cases. He also argues that taxation is a core means of regulating the nominal value of inconvertible notes and coins.

Hawtrey also notes that government notes are different from bank notes because government notes, being a legal tender, "cannot fail to circulate at par" unless "the law is allowed to become inoperative" (Hawtrey 1919, 31). As such, legal tender notes are debt-free tickets:

> A theatre ticket derives its value from the right which it confers to a seat in the theatre; a legal tender note derives its value from the right which it confers of discharging a debt. (Hawtrey 1919, 168)

Given the centrality of redemption, the valuation of a bank note heavily depends on its ability to discharge debts owed to the issuer rather than debts owed among bearers. As such, a bank note derives its (nominal) value from the solvency of the issuing bank so that "if the banker fails, the

note ceases to be worth its face value" (Hawtrey 1919, 31). A bank note "represents credit," that is, rests on the creditworthiness of the bank that issued the note.

While Knapp is often associated with tax redemption, he actually generalizes the logic to all monetary instruments. He notes that the promise to pay made by a private bank comes from the fact that "a bank issuing [a note,] is pledged by law to accept it for a payment of that amount" (Knapp 1905 [1924], 134). Knapp also argues that conversion—"a promise to pay a sum expressed in valuata money" (132)—increases the general acceptance of bank notes (139). Innes (1913) includes both tax redemption and debt-service redemption in his analysis of the "law of debt" (391):

> The coin, the paper certificates, the bank-notes and the credit on the books of the bank, are all identical in their nature, whatever, the difference of form or of intrinsic value. A priceless gem or a worthless bit of paper may equally be a token of debt, so long as the receiver knows what it stands for and the giver acknowledges his obligation to take it back in payment of a debt due. (402)

Minsky concludes succinctly that:

> In a modern capitalist system money is a debt of banks or of Treasuries and the [nominal] value of money is maintained because of the need to make payments to banks and Treasuries by debtors and taxpayers. (Minsky 1985a, 4)

Wray (1990; 1998) develops the same points for banks and the government. In all cases, conversion adds another channel of redemption that increases the willingness of the population to circulate a monetary instrument at par, but conversion is not a requirement for general acceptance.

2.2.5. Should the Material Matter?

The Platonic approach moves the analysis of monetary instruments away from their materiality toward their chartality; as such, the valuation of monetary instruments is not based on their

material content but on their expected redemption value. The question becomes whether the material matters at all. The answer comes in three parts. Firstly, the material does not matter to the nature of monetary instruments or to the nominal value at which they ought to circulate. Starting with Roman jurists, Ulpian notes that the term "money" covers not only coins but also other forms made of a variety of materials:

> The designation "money" does not only include coinage but absolutely every kind of money, that is, every substance; for there is no one who doubts that substances are also included in the designation of money. (Ulpian in *Digest*, Book 50, Part 16, §178 in Watson (1998c, 462))

Similarly, Hermogenian (who was active in the 290s and early 300s AD) classifies many things in the "money" designation:

> In the designation of "money" is included not only coinage but everything whether immobile or mobile and whether it is an object or a claim. (Hermogenian in *Digest*, Book 50, Part 16, §222 in Watson (1998c, 467))

This opinion makes sense given how well developed the Roman banking system was in Italy and Egypt by the first century BC, with interbank settlements and payments of government dues through bookkeeping transfers. Funds in accounts on a ledger are considered monetary instruments (Andreau 2015; Harris 2008).

Consistent with his acceptance of Nominalist principles, Girolamo Butigella, around the late fifteenth to early sixteenth century, repeats Paulus's position that monetary instruments can be made of any material:

> I conclude, that even if money is made of lead, wood or leather, provided it were publicly approved, it could be used to pay dues because it is the form, rather than the material, that is considered in payments. (Butigella 1608, 86)[56]

As shown in Section 2.2.4.2, Budel and Hotman concur that the material does not matter for the valuation of the coinage and the settlement of debts as long as redemption mechanisms exist.

Secondly, with the insights provided by exceptional circumstances, by the recollection of Marco Polo, by the monetary practices of feudal lords and ecclesiastic domains, and by the study of the monetary practices of the Ancient World, there is a growing recognition by European scholars that, not only can monetary instruments be made of any materials, but also that they have been so quite routinely under normal circumstances. The case of Sparta is often repeated:

> Seneca was of opinion that the Spartans used leather money, as well as iron made useless for any other purpose. Both would, of course, have a stamp upon them to show by what authority they were issued, and then they would be in exact accordance with our supposed Exchequer Bills. (Taylor 1833, 131)

And by the twentieth century, scholars have a good understanding that all types of material were used in the past and that it was not uncommon for monetary instruments to have a face value much superior to their intrinsic value:

> The metallic money issued in Greece is made of remarkably diverse materials […] gold, silver, electrum […], copper, bronze, *orichalcum* ([…] yellow brass or copper), *potin* (an alloy of yellow copper and red copper), lead, iron […] in addition to non-metallic money made of leather, porcelain, clay, wood, glass, that were sometimes employed accidentally as fiduciary money in difficult circumstances, such as sieges (Gonnard 1935, 19)[57]

[56] « decidi , quod etiam si ex plumbo , imò etiam si ex ligno vel corio fictet pecunia , dummodo publice esset approbata , posset solui pro quacunque pecunia , postq non materia , sed forma considerat »

[57] « Les monnaies métalliques émises en Grèce présentent d'abord une diversité remarquable quant à leur matière. On en connaît, frappées en or, en argent, en électrum, […], en cuivre, en bronze, en *orichalque* ([…, i.e.] le laiton ou

Thirdly, while the nature of monetary instruments is not defined by their material, it does not mean that the material does not matter, or that the relation between the intrinsic value and the face value is unimportant. Du Moulin strongly rejects Butigella's position and sticks to the Aristotelian position:

> 798. […] Some [authors] seem [to give] […] no consideration to matter or intrinsic goodness, either of quality or of weight, and to only consider the official value. As such, a coin may be made of lead or leather as long as it is officially approved, and it can be a substitute for gold or silver coins even to service loans. This is the position of Girolamo Butigella […]. But this opinion is totally unreasonable and ridiculous. By the same reasoning, money could be made from the art of printing on papyrus, which would be no less amusing and ridiculous than a child's game. This is not only contrary to the origin and definition of money, but also defies experience and common sense. From the origin it is clear, as it is from the law of nations, that minting requires a suitable material that is in a short quantity, solid, and of suitable value. Otherwise it would not be able to serve the needs of commerce, nor retain for long the same shape, value, and function in all places. (Du Moulin 1545 [1681], 322)[58]

Authors who built the Platonic approach give five reasons for the adoption of precious metals: scarcity and physical property, limiting counterfeit, collateral, acceptance abroad, and purchasing power stability. Schumpeter (1954) calls that "practical Metallism," which is a misnomer because scholars who recognize the role of precious metals do not analyze the valuation of

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cuivre jaune), en *potin* (mélange de cuivre jaune et de cuivre rouge), en plomb, en fer […], sans parler des monnaies non métalliques de cuire, porcelaine, terre cuite, bois, verre, qui furent employées accidentellement comme monnaie fiduciaires, dans des circonstances difficiles, comme les sièges. »

[58] « quibusdam videtur [...] nullo modo attendatur materia, nec bonitas intrinseca, sive qualitatis, sive ponderis: sed sola æstimatio publicè imposita, ita, ut possit fieri moneta plumbea, vel de corio, modò sit publicè approbata, & tunc possit solvi pro quacunque pecunia aurea vel argentea, etiam ex mutuo debita: & ita tenet Hieron. Butigel. [...]. Sed hæc sententia prorsus irrationabilis est, & ridicula: eadem enim ratione posset sieri pecunia de papyro arte impressoria , quod non minus esset ludicrum & ridiculum, quàm ludus puerilis: & est non solùm contra originem & definitionem monetæ, sed etiam contra experientiam & sensum communem. De origine patet, cùm sit de jure gentium, & sic requirit subjectum delecta & idonea materiæ, quæ in brevi quantitate sit solida & congrui valoris: alioquin non posset deservire usibus commerciorum, nec eumdem usum & valorem & functionem diutius retinere ubique locorum. »

monetary instruments and the settlement of debts by using, respectively, the commodity theory and Metallist principles. The role of precious metals is studied within the chartal theory and within Nominalist principles.

First, the needs of commerce—i.e., range of denomination, portability, and ease of identification—must be considered if an instrument is going to be used in petty exchanges and small commercial transactions. This is all the more so in an agrarian society in which people are less familiar with financial concepts and relate easily to corporeal forms, which is where precious-metal coins shine. However, as noted in Section 2.2.3.1, it is recognized by Davenant, Berkley, Montesquieu, Thornton, among others, that precious-metal coins are not a convenient means of performing most commercial transactions and that paper notes and scriptural records on a ledger are more accommodative of the needs of commerce.

> To reproach [a paper note] with being a merely fictitious thing, because it possesses not the intrinsic value of gold, is to quarrel with it on account of that quality which is the very ground of its merit. Its merit consists in the circumstance of its costing almost nothing. (Thornton 1802, 171)

Precious-metal coins lack denominational range, lack uniformity, are cumbersome to use (heavy and dangerous to transport, take time to collect, take time to count and/or weigh) and cumbersome to produce (scarcity of material and take time to make). Scarcity, in the sense of difficulty to find the material necessary to make a monetary instrument, is not a desirable property, contrary to what Du Moulin argues; limitations on issuance should be based on more relevant criteria (creditworthiness, counterfeiting prevention, available resources, etc.). The convenience of paper notes is reinforced by the stability of their nominal value:

> bank money has a property and a stability in it, which no material money is capable of acquiring, and for this reason it is preferable to it, and is properly considered as the thing fixed. (Steuart 1767b, 57)

Given that Nominalism prevails in civil law and domestic commerce, with paper notes merchants do not need to spend time worrying about the fluctuations in the value of the precious metals that generate uncertainty about the circulation value of coins and so uncertainty about nominal profits and the settlement of debts. This accommodative nature of paper and scriptural forms reduces the cost of transactions and promotes commerce. As such, the substitution of notes for coins is deflationary if the money supply does not change:

> Paper credit, also, promotes general cheapness, by sparing much expence and trouble in weighing, counting, and transporting, money; and by thus facilitating more particularly the larger transactions of the merchant. (Thornton 1802, 315)

The advantages of the accommodativeness of financial instruments made of paper and other base materials has been known for millennia. There are records of "merchants in Babylonia and Caldea paid by [bills of exchange] inscribed on clay bricks" (Geva 2011, 112) throughout the 9th or eighth century BC in Mesopotamia, Herodotus (484BC–425BC) mentions the use of wooden tally sticks used in fifth century BC Athens (Depeyrot 2019, 19), and banking services go back to temples in Ancient Mesopotamia (Hudson and Wunsch 2004). Non-cash payment methods were common in Roman times, receded to the Byzantine Empire during the collapse of the Western Roman Empire, and reemerged progressively in Occidental Europe from the tenth century (Harris 2008; Meder 2016; Rüfner 2016; Andreau 2015; Bogaert et al. 1991).

Second, given that precious metals are costly to acquire, monetary instruments made of precious metals make counterfeiting easier to detect and less profitable if face value is close to intrinsic value, which preserves the quality and quantity of the domestic coinage and decreases the risk of tax avoidance. Once again this is found in Du Moulin:

> 800. […] the material for the manufacture of false and counterfeit money had been taken away from all, so that no profit could be expected from it, but mere loss, since the money formed was of no more value than in material. (Du Moulin 1545 [1681], 323)[59]

[59] « quoniam omnibus sublata esset materia falsam & adulterinam monetam fabricandi, utpotè cùm nulla inde speraretut utilitas, sed merum damnum, cum pecunia formata non plus valeret, quam in materia »

Barbon (1690 [1909]) notes that if the face value is too high relative to the intrinsic value, it is profitable to counterfeit, so:

> the chief Advantage of making Mony of Silver and Gold, is to prevent Counterfeiting; for Silver and Gold, being Metals of great Value, those who design Profit by Counterfeiting the Coin, must Counterfeit the Metals, as well as the Stamp, which is more difficult than the Stamp. (17)

Counterfeiting is a game for "the rich man" that can be prevented by limiting the markup over intrinsic value to 10–15 percent (Barbon 1696, 67–68). Barbon also notes that the markup is needed to prevent the melting and export of coins if the metal price goes up in such a way that intrinsic value is higher than the official value. John Briscoe (1670–1760), a banker and business partner of Barbon, argues that it is easier to detect counterfeits when coins are made of a precious metal (Briscoe 1696, 94–5). Taylor (1828, 44; 1862, 260) also makes that argument and ties it to the need to ensure that tax debts do generate a transfer economic resources to the sovereign:

> Counterfeit coin would appear to have been resorted to as a means of escaping payment of the full burden of the tribute. (Taylor 1833, 49–50)

However, there is an awareness that the use of precious metals is only a second-best solution because of the possibility of plugging, sweating, clipping, and using urine to fraud.[60] Galiani (1751 [1977], 151) and Jevons (1875, 60) note that the best preventer of counterfeiting is technological innovation. This is true not only for coins but also for paper notes. Thomas Smith

[60] Plugging means extracting precious metal from the inside of a coin and filling the void with base metal. Sweating means shaking coins in a bag to extract precious-metal powder (silver and gold are soft metals). Clipping means cutting pieces of metal around the irregular edges of coins (Ancient and medieval European minting techniques were too crude to produce coins with smooth and firm edges). Depletion silvering involves heating coins into an acidic solution (usually based on urine in Antiquity and Medieval times) to remove alloys from the surface of silver coins, thereby making it very difficult to detect debasements (by king or counterfeiters) (Bogaert 1976): "On placing a piece of [silver] upon an iron fire-shovel at a white heat, if the metal remains perfectly white, it is of the best quality: if again it turns of a reddish colour, it is inferior; but if it becomes black, it is worthless. Fraud, however, has devised means of stultifying this test even; for by keeping the shovel immersed in men's urine, the piece of silver absorbs it as it burns, and so displays a fictitious whiteness." (Pliny 77 (1856), 125)

(1807) goes further and argues that paper notes are "more difficult to be counterfeited, and much easier detected, when so" (34).

Third, the provision of a collateral via a precious metal increases acceptance. This does not mean that Platonic scholars see the essence of coins in precious metals, in the same way a home is not the nature of a mortgage, but the material provides some guarantee in case of default. Du Moulin follows the Romanist position (face value must equal intrinsic value) despite being a proponent of Nominalism, not because he believes coins are to be valued by weight but because he is afraid that the king will abate the coinage. Briscoe (1696, 12–3) also praises the role of precious metals in putting a check on the "caprice of Princes." Boisguilbert (1707 [2023]) argues that precious metals are a form of collateral that is necessary when the creditworthiness of the issuer is not strong:

> Because [silver] is and must only be a pledge on the future ability [to transact] […] when the solvability of the buyer is too weak to vouch for his word or note, which otherwise would be preferable to the use of this metal […]; almost no one needs this guarantee because of personal assets; and consequently, silver is not used [in commerce]. As such, given that it is absolutely useless in commerce, [silver] must offer its service to households and magnificence in order to keep busy, because it waits until it is needed for monetary uses, in which case it is always ready to do good, although this help can only be implored when the state is struck by sickness, […] which severity is known by the search for, or the dearness of, gold and silver. (277)[61]

For Boisguilbert, this collateral is not only nominal but also real because, as he argues along with others, silver and gold have a stable purchasing power that can be concentrated in small

[61] « Comme il n'est et ne doit être que le gage de la tradition future, […] et qu'il ne réside ou n'apparaît pas assez de solvabilité dans l'acheteur pour la garantie par sa parole ou par son billet, sans quoi on préférerait cette voie au service de ce métal , […]; et c'est alors une conséquence indubitable que ce métal soit remercié presque par tout le monde. […] Ainsi , étant absolument inutile au commerce , il est obligé , pour ne pas demeurer à rien faire , d'offrir son service au ménage et à la magnificence, car il est dans l'attente qu'on ait besoin de lui , auquel cas il est toujours prêt à bien faire, encore que ce secours ne puisse être imploré sans que l'État soit malade, […] dont on connaît l'extrémité par la recherche ou la cherté où l'or et l'argent se trouvent. »

quantities and carried away, or buried, in times of emergency. The idea that precious metals are a convenient source of stable purchasing power, or at least a purchasing power that varies less than other commodities, is common to both approaches. It makes some sense given the frequent socio-political-economic instability of the past, although discovered hoards do contain many coins made of base metals and the purchasing power of silver and gold was never stable (Appendix 4).[62]

Dutot returns to the preoccupation of Du Moulin, coins include a collateral to protect the population against the sovereign's mismanagement of the coinage:

> Silver and gold money is not only a common measure, it is also a barter, or pledge, that has real value like other commodities. Unenlightened people need such a guarantee against the Royal authority, at least until it does not perceive any threat from that side. (Dutot 1738, 234–5)[63]

Montesquieu also emphasizes such concern and adds the role of international merchants and bankers who keep the sovereign in check by limiting his ability to manipulate the coinage too much relative to other sovereigns, because of the threat of loss of domestic coinage (e.g., melt into silverwares and/or export of coins) and foreign exchange depreciations (Montesquieu 1750 [1794], 63–77).

In his analysis of John Law's System, Steuart notes that lowering the face value of paper notes is a form of default and that such default is more damaging than an abatement of the coinage because there is no intrinsic value; the collateral for the notes is tied to the assets of the bank rather than immediately available in the form of a commodity. In addition, abating the notes of a bank without abating the coinage creates a run on the issuing bank:

[62] The empirical validity of such claim is no longer straightforward (Van Hoang et al. 2016).

[63] « La Monnoye d'or & d'argent est non-seulement une mesure commune; elle est aussi un troc ou un gage, qui a une valeur réelle comme les autres Marchandises. Le Peuple peu éclairé a besoin d'un tel gage, pour le garantir contre l'autorité, au moins jusqu'à ce qu'il voye qu'il n'a plus rien à craindre de ce côté-là. »

> The immediate consequence, therefore, of touching the denomination of the paper, was, to shew the public that their fortunes in paper were liable to the same inconveniences as fortunes in specie; that is, that they might be increased or diminished at pleasure. Upon this it was very natural for every one to endeavour to realize his paper, and put it into coin: since, in *pari casu*, it was better to have it in that which had some intrinsic value, than in that which had none at all. […] The operations upon the specie never could destroy the intrinsic value of it, however they might prevent the circulation of it for a fixed legal denomination; therefore it remained under all combinations of circumstances, a thing valuable to be acquired; and it still remained a commodity, desirable by all, and was therefore constantly demanded. But a discredit cast upon the paper had a different effect. The value *there* depended entirely upon the will of the state, and every body saw that it was as easy to annihilate it, as to reduce it to one half. The discredit, therefore, had the effect of stopping *the demand for it*, that is, the currency; consequently, a run upon the bank immediately took place. (Steuart 1767b, 284, 287–8)

Taylor also promotes the use of a coinage with an intrinsic value close to the face value, not only because he is afraid of abatement, but also because he fears that the future kings will not follow up on the promise made by previous kings to redeem current coins via tax payment:

> It is of importance that the tribute money issued by the ruling power in any nation, should possess an *intrinsic* value nearly equal to its *nominal* value, saving the legalized seignorage before mentioned; for if it does not possess this intrinsic value, and the Government were to refuse to receive it from the people in payment of taxes (as is the case now in some countries), the people have no means of enforcing their claim, and the money is comparatively worthless to them. (Taylor 1862, 266)

A well-established fiscal authority with efficient tax imposition and collection mechanisms allows face value to be higher than intrinsic value:

> Thus it appears that whilst the value of silver uncoined is entirely dependent upon the principle of barter, the value of coined silver is made up partly of the mercantile value of

> the raw material, and partly of the royal sanction, the relative quantity of each being varied according to the power, will, or necessities of the monarch (Taylor 1828, 55)

In the context of collateral demand, Wilson (1811) also notes that the use of precious metals increases the acceptance of a monetary instrument, both domestically and internationally:

> Intrinsic value, as a collateral security, may certainly have contributed greatly to establish the first currency of the metals; in the same manner that a promise to exchange Bank notes, with gold or any other currency, was at first essential to stamp their credit and value. (111)

At the same time, he argues that access to the collateral should not be at the will of the bearers, in the same way a bank cannot take the house of a mortgagor whenever it pleases:

> Lord Liverpool's *intrinsic value*, […] may certainly be of use in giving additional credit to mediums of currency, in that it will operate as a premium of insurance, to their otherwise mere credit adventure—as a salvage paid to rescue that adventure from total loss, but like all such payments, it is foreign to the natural course of the adventure itself: it is necessarily a dead load—an entire drawback; on all its regular profits. […] Though in the gradual discredit of currencies, it should, in strictness, await the conclusion of the process, and remain a perfect caput mortuum at last. (102)

Wilson (1812) notes that the confusion between the collateral and the monetary instruments is at the source of all monetary mismanagements:

> This appears to me to afford us the true key, to almost all our present errors on the subject of money; which arise from our habitually confiding in its credit, till we forget that this is essentially a distinct consideration from its pledged security. (80)

It is not that precious metals are unimportant but that they should be given their proper place "as a check upon that natural exuberance" (Wilson 1812, 98) and not be confused with monetary instruments. Knapp (1904 [1924]) is also in favor of a coinage with high intrinsic value:

> The hylic content is the pledge which the holder keeps (1) against the disappearance of chartality if the State and its law should perish; (2) more seriously in order to have money to use outside the country in foreign trade. (67)

This brings the two final reasons advanced for the use of precious metals: the promotion of external trade and war expenses. Coins are seen as a tool, as well as a target,[64] of wars. Thus, it is crucial to not make one's coins lighter than other sovereigns in order to attract mercenaries and make payments in occupied countries:

> 801. Let all, therefore, see what our princes are doing. From time to time they mint thinner and lighter coins, which weakens their forces against the kingdoms they attack. (Du Moulin 1545 [1681], 323)[65]

Geminiano Montanari (1633–87), among others, expands on the topic by stating that a self-sufficient economy (like feudal fiefdoms in the Middle Ages) does not need to care about the quality of the minting material:

> If a state did not trade with others and lived only on the comforts that its land produces, as China and other People have done for a long time, the prince could evaluate his coins as he pleased and be made of what material they wanted. […]. And, although in those few contracts they make with strangers they are forced to avail themselves of gold and silver coins, of which there is no shortage for such occurrences, among them those made

[64] A common means to try to defeat an enemy is to find means to destabilize its monetary system by injecting counterfeits, preventing inflow of the necessary material, casting doubts among the population about the legitimacy and stability of the government, among others.

[65] « 801. Viderint ergo omnes quid agant Principes nostri, dum subindè pecuniam dilutiorem & leviorem cudunt: sic enim contra semetipfos & vires regni sui, quas atterunt , molliuntur. »

of paper are valued equally with those of any metal, in accordance with the king's currency; […]. Therefore, that Prince, whose subjects did not contract with foreigners, could value his coins as he pleased without causing prejudice to his subjects; […]. The Spartans, when Lycurgus forbade them to use any coin except those made of iron, spent a few hundred years with it, […]. But, for external wars, they needed gold and silver, because in alien lands, where other peoples were not content to live in the Spartan way. The Spartans used iron money domestically, but, if they had no other [for foreign trade], they would not have been able to sustain their standard of living. Therefore, if a prince wants his own silver and gold coins to be accepted by foreign peoples, so that his subjects can trade with them, he cannot evaluate them except according to their internal goodness and value, otherwise the other princes will not want to receive fine silver and low-alloy silver at the same price; nor will foreign merchants want to receive money that would be detrimental to spending it again in other places. The other princes will not want to receive fine silver and low-alloy silver at the same price; nor will foreign merchants want to receive money that would be detrimental to spending it again in other places. And this is the reason, which imposes an almost precise necessity on all princes to value their coins according to their intrinsic value and goodness, without benefiting their own purse in anything other than that little bit of seigniorage which they scarcely take beyond the cost of the mint […].[66] (Montanari 1683 [1804], 104–6):

[66] « Se uno stato non avesse punto di commercio con gli altri e vivesse delle sole comodità che produce il suo terreno, come ha fatto tanto tempo la Cina ed alcuni altri. popoli, potrebbe il principe valutar le sue monete quanto a lui piacesse, e fossero di che materia si volessero. […] E sebbene in que' pochi contratti che fanno con gente estranea sono forzati a valersi dimonete d'oro e d'argento, di che non hanno per tali occorrenze carestia, fra di loro però si valutano quelle di carta al pari di quelle d'ogni metallo, conforme la valuta il re; […]. Perciò quel principe, i sudditi del quale non contrattassero con gli esteri, potrebbe dar valore alle sue monete conforme a lui piacesse senza far pregiudizio a' sudditi; […]. Gli Spartani, allorchè Licurgo vietò loro ogni moneta fuorchè di ferro, se la passarono qualche centinaja d'anni con quella, […]. Ma le guerre esterne avevano bisogno d'oro e d'argento, perchè in terre aliene, ove gli altri popoli non si contentavano di vivere alla Spartana, gli stessi Spartani avevano bel mostrare moneta di ferro, che se altra non avevano, non avrebbono a' bisogni del vivere potuto provvedere. Se dunque un principe vuole che le proprie monete d'argento e d'oro siano accettate da' popoli stranieri, sicchè possano i sudditi aver commercio con essi, non può egli valutarle se non giusta l'interna bontà e valore, altrimenti gli altri principi non vorranno già ricevere allo stesso prezzo l'argento fino e quello di bassa lega; nè i mercanti forastieri vorranno ricevere moneta che a spenderla nuovamente in altri luoghi porti discapito. E questa è la ragione, che impone necessità quasi precisa a tutti i principi di valutar le loro monete giusta l'intrinseca valuta e bontà loro, senza vantaggio della propria borsa in altro che in quel poco di signoraggio che oltre la spesa di zecca scarsamente si pigliano; […]. »

However, England, during the Napoleonic War, showed that paper can be used if tax redemption is strong. Berkley (1735) argues that the fact that paper notes only have a "local value"—i.e., they do not circulate abroad—is an advantage because it permits the mobilization of domestic resources without the fear of melting and export of domestic monetary instruments, as "the Example of our Colonies in America doth […] make it as plain as Day-Light" (48). Some authors propose to have different monetary instruments for domestic and foreign transactions. Plato, in *Laws*, Book 5, promotes strict capital controls:

> Further, the law enjoins that no private man shall be allowed to possess gold and silver, but only coin for daily use, which is almost necessary in dealing with artisans, and for payment of all those hirelings whose labour he may require, whether slaves or immigrants. Wherefore our citizens, as we say, should have a coin passing current among themselves, but not accepted among the rest of mankind. (Plato 360 BC–347 BC (1875), 313–9)

Taylor (1842, 48) and Duncan (1858, 29) argue that the notes of the Bank of England, if not accepted by foreigners, should be convertible at market price and that "every independent STATE is entitled to issue legal tender for its own internal purposes in discharge of private debts and public taxes within its own realm" (Duncan 1858, 28). This strongly echoes the idea of monetary sovereignty that was revived recently by Wray (1998; 2015) and Kelton (2020). The broader point is that the demand that gold and silver be used to make coins has nothing to do with the nature of coins, but rather reflects the demands of a powerful minority of the population—international merchants, bankers, rent seekers,[67] and mercenaries. The majority of the population could, and did, get by in trade without gold and silver coins and was more interested in an efficient and practical medium of exchange and means of payment.

As techniques to prevent counterfeiting improved, as the creditworthiness of the state and banks increased through the establishment of reliable tax redemption channels and government backing of bank monetary instruments, and as unpredictable nominal mutations disappeared from the

[67] The "prélats, barons, chevaliers, escuyers, chapitres, collèges, gens d'Église, bourgeois" among others (Duc Jean V in Bloch 1955, 58).

eighteenth century (Bloch 1955, 79-80), the use of precious metals became less relevant. The natural scarcity of precious metals was rather a crippling arbitrary constraint (and a source of monetary instability, especially with bimetallism) and the goal became to make sure that the monetary system did not get in the way of economic expansion. A monetary system is a tool to finance the economy so the system must be highly accommodative via issuance and redemption mechanisms that meet the demands of its users. Law, Steuart, Potter, Berkley and Barbon all aimed at creating a more flexible monetary system that permits the full employment of domestic resources for economic growth, although they were at times too sanguine by assuming that just doing so would ensure more economic prosperity. The anti-Bullionists and the Banking School proponents have the same objectives and the modern expression of that goal is found in the Post-Keynesian framework (via the endogenous money theory and Modern Money Theory). Post Keynesians argue that, rather than constraining monetary systems via a scarce and inelastic material, it is best to manage them via political and economic constraints.

Overall, the use of precious metals was an imperfect expedient for the lack of proper technologies to prevent counterfeiting, for the poor creditworthiness of the sovereign because of his lack of ability and willingness to impose and enforce taxes and his lack of control over the monetary system, for the unfamiliarity with monetary experiences of agrarian societies that relate more easily to commodities and corporeal things, and for war and foreign trade. In all cases, the trend has been to try to get rid of precious metals by inventing better technologies to prevent counterfeiting, by raising the creditworthiness of the government by increasing taxation power and political legitimacy, and by educating the population in abstract financial concepts.

2.2.6. Unit of Account and Monetary Instruments

It took millennia to understand that a unit of measurement is something different from what is counted. Records available show that, from 8000 BC, concrete counting starts via the use of plain tokens. To count a measure of grain, one used cone-shaped tokens, but to count jars of oil one used ovoid-shaped tokens. The recognition that counting tokens are abstract counting tools that do not refer to anything specific—and may be of any shape or material desired given that those characteristics are irrelevant to the counting process—came around 3100 BC with the creation of abstract counting via written inscriptions on pictographic tablets (Schmandt-Besserat

1992 196ff.; Nissen et al. 1993; Englund 2004). This transition from concrete counting (each item is counted by using a specific counting device) to abstract counting (a given counting device can be used to count any item) was central to the development of units of account.

It took a few more millennia for scholars, and even more so for a population with a "mind oriented toward concrete thinking" (Bloch 1955, 29), to apply to monetary analysis the conceptual leap made in 3100 BC regarding counting. This conceptual struggle is reflected in the Roman and medieval legal disputes among contracting parties over the meaning of payment recorded in denier, guinea, pound, etc. It is the abstract quality of the unit that forced contracting parties to go to court and pushed—as presented in Section 2.1.1—legal scholars, and later economists working with the Platonic framework, to clearly separate units of account from monetary instruments. A guinea unit does not refer to gold coins, it only refers to a counting measure (gn) that is linked to other denominations of the monetary system through a fixed relation (e.g., 1gn = 21s.) and debts denominated in that unit can be paid in many ways.

Montesquieu makes a distinction between "ideal money" and "real money": coins are the "real money" while unit of accounts are "ideal money" (Montesquieu 1750 [1794], 59–60), where "ideal" does not mean "perfect" but rather "symbolic/abstract/that exists in thoughts." Similarly, Steuart (1772) makes a distinction between "symbolical money" (the unit of account) and "real money" (monetary instruments made of various materials). In his *Principles of Money Applied to the Present State of the Coin of Bengal*, Steuart restricts the word "money" to the unit of account and argues that there is a difference between unit of account, coins and bullions. He notes that a unit of account is an "arbitrary scale" that is not defined by a quantity of commodity:

> Money, which I call of account, is no more than *an arbitrary scale of equal parts, invented for measuring the respective value of things vendible*. *Money of account*, therefore, is quite a different thing from *money-coin*. […] Money of account, which I shall here call money, performs the same office with regard to the value of things, that degrees, minutes, seconds, &c. do with regard to angles, or as scales do to geographical maps, or to plans of any kind. (Steuart 1767a, 526)

> By money, we understand nothing more than the denomination which determines a proportion of value. The pounds, shillings and pence, in a merchant's account the pounds expressed in a bond, bill, or bank note, are all denominations of money, but they are not coin, any more than they are bullion. […] The use of money is to value goods, and to keep accounts clear between man and man. […] While gold and silver, therefore, pass by *denomination*, they are *money*, when they are valued by their *weight*, they are *bullion*. (Steuart 1772, 5)

Anne Robert Jacques Turgot (1727–81) also separates units of account from monetary instruments. He notes that units of account are just abstract concepts with arbitrary names that may be taken from things around us, but the relation of the unit to that object is not fixed. He takes an example by assuming that "sheep" is used as a unit of account and notes that a sheep (the animal) can be worth two sheeps (the unit) (Turgot 1795, 166–7). Consequently, a coin named "denier" may be worth more or less than one denier unit and a debt of 20 solidus is not a debt that requires the payment of 20 solidus coins, or the payment in other coins for an equal amount gold.

Thomas Smith (1832, 10–1) notes that, like the meridian, the equator, the north pole, etc., units of account are imaginary reference points but these abstract references matter greatly. Like Turgot, Smith notes that even if a unit of account takes its name for a physical thing, it is not constrained, or defined, by it. The "bar of iron" unit in Africa did not refer to any bar of iron and a bar of iron could be valued at "a bar and half or two bars each; if they were too abundant, their value might fall to three-fourths of a bar or half a bar each." (Smith 1832, 13)

Knapp notes that units of account can be set up by any pay-society and does not have to be connected to the unit used by the State, such as the Mark Banco in Hamburg (Roberds and Velde 2016a), so that an economy may have different payment systems using different units of account (Knapp 1905 [1924], 148). France and other European countries are well known to have had a multiplicity of units of account throughout the Middle Ages (Lane and Muller 1985; Sédillot 1953).

Nussbaum points out that monetary systems are composed of an "ideal unit" and "money pieces," and argues that the ideal/symbolic unit is a "core of the money concept" (Nussbaum 1950, 15). Olivecrona (1957, 68) notes a difference between "money of account" and "money of payment" and that "the 'pound' is not identical with a sovereign or a one-pound note." Instead, a coin called sovereign is officially priced at 20s., one sterling pound, but its official and circulation values could change over time. Olivecrona notes that numerous modern scholars have emphasized the importance of the distinction, Knapp (1905), Hawtrey (1919), Keynes (1930), Commons (1934), and many others. For example, Hawtrey concludes that the "money of account must exist before the money" (Hawtrey 1947, 8) and Koopman states:

> Money is not a uniform but a dualistic phenomenon: "medium of exchange" or "medium of payment" on the one hand and "unit of value" or "unit of account" on the other hand are not two "functions" of one and the same thing, "money", but rather two different objects of knowledge. (Koopmans in Olivecrona 1957, 75)

In all these works, an important point to note is that units of account are necessarily abstract concepts, even in a metal standard. Indeed, the price of metals is set in the unit of account (e.g., $20 per oz. of gold), not the other way around (1/20 oz. of gold per dollar). Metal standards are just a buffer stock policy on metals:

> It is just as if the government bought all the eggs in the country at a given price and kept them in cold storage rather than sell them at a lower price. (Innes 1914, 164)

In addition, if coins are made of precious metals, it is so for the reasons explained in Section 2.2.5 rather than to define the unit of account. The name of a unit may be taken from a weight of metal but, once created, a unit of account becomes independent from that weight and indeed greatly varies from it:

> Unfortunately, in this country, the people have been so long in the habit of weighing with a pound weight, and paying with a guinea, [...] that even men of superior education and improved minds have treated the subject so superficially as to state, that, "if we weigh

> with a real pound, it is equally true that we go to the market with a real guinea;" and, when we do so "we purchase in proportion to the *value of the metal* in the guinea," without appearing to conceive it at all necessary to inquire how that value is to be ascertained. […] In this country a pound of silver was, originally, the article assumed by our ancestors as the point of comparison, and that term was actually represented by a real pound of fine silver. By degrees, the quantity of silver employed to represent it became less and less; still the term pound was and is retained, so that it must be obvious that it cannot have reference to a pound of fine silver; and that, therefore, Dr. A. Smith was mistaken, when […] he says: "In England, […] all accounts are kept and the value of all goods and of all estates is generally computed, in silver." […] For, in Great Britain, the pound sterling appears to be really and truly the standard by which the value of all articles is regulated and ascertained. The gold, silver, and copper, coins, which have been issued by government; and pass in common circulation, being, just the symbols, or tokens, of that standard, are employed expressly as such, and not as articles of real value themselves. Therefore, when it is said that such a man is worth ten thousand pounds, it is not meant that he is really possessed of ten thousand pounds weight of silver, or any quantity of silver, nor has it any relation whatever to silver or gold. It is merely to be understood that he holds property in lands, houses, merchandise, debts due, to him, &c. [which are worth] […] ten thousand times the standard of the countries […], which […] is always stated at so many pounds, or parts of a pound sterling. […] This ideal standard, or, as it will in future be called, the standard unit, [..] has no real value itself. (Smith 1811, 24, 36–40)

The unit of account merely measures it does not determine purchasing power. As noted in Sections 2.1.1 and 2.2.3.2, there is no evidence that domestic economic calculations are made implicitly in quantity of metal (oz., lb., etc.) under the veil of nominal calculations (s., £, etc.).

Given the importance of the distinction between the unit of account and the financial instruments denominated in that unit, some authors want to reserve the word "money" either to the unit of account or to monetary instruments. Knapp and Hawtrey used "money" to mean tokens recognized by law as monetary instruments: "[m]oney always signifies a Chartal means of

payment" (Knapp 1905 [1924] 38). Keynes does the same: "the money of account is the *description* or *title* and the money is the *thing* which answers to the description" (Keynes 1930, 3). Yet, others argue for leaving aside the word "money" altogether and, instead, using the distinction between monetary instruments and unit of account (Olivecrona 1957).

2.3. Origins of Monetary Systems: Hospitality and Command

On the origins of monetary systems, most scholars who developed the Platonic approach focus on the needs of commerce as was first exposed by Plato and Aristotle. Paulus provides an early exposition of the inconvenience of barter and the problem of double coincidence of wants:

> All buying and selling has its origin in exchange or barter. For there was once a time when no such thing as money existed and no such terms as ‘‘merchandise’’ and "price" were known; rather did every man barter what was useless to him for that which was useful, according to the exigencies of his current needs; for it often happens that what one man has in plenty another lacks. But since it did not always and easily happen that when you had something which I wanted, I, for my part, had something that you were willing to accept, a material was selected which, being given a stable value by the state, avoided the problems of barter by providing a constant medium of exchange. (Paulus in *Digest*, Book 18, Part 1, §1 in Watson (1998b, 57))

This is repeated time and time again all the way to the anti-Bullionists, Banking School proponents (Monroe 1923). Jevons (1875) reemphasizes the centrality of the problem of double coincidence of wants as the reason for the emergence of monetary systems.

Two exceptions to the barter story are Jevons who recognizes the role of tribute and taxes in the "pastoral stage" of monetary systems and, more forcefully, the Taylor brothers. James Taylor (1862) makes a difference between "tribute money" and "mercantile money." He argues that "mercantile money" is made of a valuable commodity and that "uncoined gold or silver may be money" (12), which is inconsistent with the Platonic approach. "Tribute money" can be made of a valueless material because what gives it value is the embedded promise to redeem it in taxes. This type of monetary instruments must have a sign because the sign shows that the instrument is

legal tender for all debts, including dues owed to the government (12). Taylor calls "tribute value" the face value. Beyond the area of influence of the sovereign, "tribute money" circulates at its "mercantile value" (12).

James Taylor argues that tribute debts imposed by a conqueror were the driving force behind the monetization of the Roman Empire and medieval European economies.[68] At the time of the Roman Empire, coins with the faces of Roman emperors were introduced in conquered areas and, "[t]he coin was, in fact, a representative of a tributary engagement, and the first step towards a more perfect credit system" (Taylor et al. 1832, 12).

He argues that, in medieval England, the coinage had been tax-driven since William the Conqueror. Henry I further developed the tax system and this "was infinitely superior as a means of oppression" relative to military force (Taylor 1828, 14). With that system in place, tax payments transitioned from being paid in kind to being paid in coins:[69]

> Thus we see that the foundation of an absolute money system was begun in a series of measures which made it the interest of the people voluntarily to pay tribute in money rather than in kind, wherever they could, and that it was completed in the reign of Henry the First. (Taylor 1828, 16)

For Taylor (1828), this transition was the driving force behind the monetization of the English economy, both in Roman times and during the remonetization of the economy in the Middle Ages, and occurred because the king found it more convenient to tax in coins instead of in kind (the burden of collecting, transporting and selling surplus output is shifted onto the population):

[68] The term "tribute money" is already found in Stephen Martin Leake's 1745 *Historical Account of English Money* (to explain that the introduction of Roman coins in Britain was done on that basis) as well as in William Camden's 1605 *Remains of Britania*.

[69] While Taylor argues that the transition was completed by Henry I, modern scholarship shows that the full monetization of tax payments took centuries (Desan 2014).

> The tithe collector finds it much more convenient to receive money than produce; be therefore offers to take, as a commutation, such a sum as the farmer knows to be of somewhat less relative value in the market than the hay, corn, or wool which he must otherwise give, and therefore he sells his goods, and gives money to the tithe collector. Upon this principle, therefore, William got his wants supplied. He fixed the rate at which he would receive money as a commutation for services or purveyance, and this gave the coin payable as tribute its circulating value. (8)

As the population became accustomed to monetary transactions, although "this money was first coined for the express purpose of tax or tribute, it afterwards came into common use" (Taylor 1828, 10) for other reasons than paying taxes:

> This principle, it has been seen, was no sooner sanctioned by the king of England in the collection of his revenue, than the shrewder part of his subjects began to discover, that the surest way to get wealth was to accumulate that particular species of property which was then endowed with supreme authority over all the rest. (Taylor 1828, 150)

> Thus the money system of the Conqueror was rather calculated to be a convenient mode of taxation, or of collecting a revenue through the willing agency of the people, than a system of currency, though it is obvious that a currency system would very naturally grow out of it. This maybe illustrated by what has happened in our own times, if we observe the operation of our credit system, as it existed under the Bank Restriction Act. The government was empowered by parliament to enforce payment of a given number of millions of pounds sterling from the people for the forthcoming year. The bank note was authorized by law to represent the pound sterling. Payment of the money was then anticipated by exchequer bills; the Bank of England gave their promissory notes to government for the exchequer bills; with the promissory notes of the Bank of England the government purchased their stores from the people; and the people were content to take those notes for the produce of their labour, &c., because the government was pledged to take them again for taxes. (Taylor 1828, 9)

The taxation system based on the coinage of William the Conqueror works in the same fashion as one based on the notes of the Bank of England; tax collectors return the notes to the Treasury. At the time of William, the silver coins were the bank notes.

Going further back in time, scholars such as Laum (1924), Polanyi (1957), Grierson (1977), Aglietta et Orléan (1998), Peacock (2006), Semenova (2011), Bell and Henry (2001), Tymoigne and Wray (2006), and Théret (2024) have noted the role of tribal debt arrangements, followed by religion, in the origins of modern monetary systems. Henry (2004) adds the role of deceit and class in the emergence of monetary systems in Ancient Egypt. The common point is that the origins of monetary systems are not found in the needs of exchange but, instead, in the need to maintain the social cohesion of the tribe. Aglietta and Orléan (1998) put it this way:

> Money is a double-sided social bond: on one side needs and obligations, on the other side exchange and trust in each other. […] Money comes from a debt to an authority and a hierarchy of values. […] Human history shows that this financial link precedes market exchange […]. Originally, debt is not a relation between independent individuals, like in modern private finance: debt is a social bond that defines who people are in a society. […] The original, or primordial, debt is a core element of the identity of every living individual and of the perpetuation of society as a whole. It is a debt of life. In its archaic understanding, this debt is an acknowledgement of a dependence of human beings toward sovereign powers—gods and ancestors—that granted to them a part of the cosmic force that such powers generated. The counterpart to the gift of this life-sustaining power is the obligations of the living to repay, over their lifetime, this vital power that was granted to them. […] The biggest mistake that one can make, if one wants to understand the nature of money, would be to reject this concept of primordial debt under the pretext that we no longer practice […] such tradition. […] The reason why modern thinking about social relations does not recognize [primordial debt] is because it has been split into private debt of an economic nature and social debt of a political nature. […] Economic debts […] insert individuals in a division of labor hidden behind market exchange. To be an autonomous, in the sense of one's ability to act and decide, member of a mercantile society implies being able to make others appreciate the product of one's activity

> according to a logic defined by money. [As such,] private debt is […] a relation of dependence of the individual to society, thanks to which an individual gets social recognition. There is however a type of debt that points to an inverse dependence of the whole society toward its members: social debt. […] In [democratic] capitalist societies, […] [it takes the form of] a social debt toward individuals from whom sovereignty is obtained. As a counterpart to this debt of the collective toward its members, they have social rights—education, safety against collective risks and access to core infrastructures—that guarantee the continuity of the territory. These are elements of the collective power that promote social cohesion and the global productivity of the society. […] The structure and effectiveness of this social debt are regulated by national governments that can only assume such a debt if they have political legitimacy. […] The overlap of private debts and social debt is done by the homogenization of their measure in a unit of account and by the obligation to pay them in money. (21–4)

Humans are social animals, not independent self-sufficient individuals, and, as such, are bound to the rest of society through a debt of life; *homo economicus* is a myth, as is the barter story of monetary systems. This debt of life is still present today and is expressed through a network of private debts (economic debts such as bank debts) and social debts (such as tax dues). Debts owed to issuers of monetary instruments are a core element of monetary systems because the wide acceptance of such instrument is based on the ability to have a large network of entities indebted to the issuers. This network is created through fiat (tax liability is imposed by an authority) or through bearers willing to become indebted to the issuer (bank debt), and ties each human being to the rest of society via the need to interact with others to be able to pay these debts. "Money" is a story of social relations, power, struggles, oppression, exploitation, and economic and political competitions; it is not a story of isolated beings who willfully gathered to trade on equal footings.

2.4. The Road to Managing Chartality: Macroeconomics, Public Finance and Monetary Systems

Scholars of the Platonic approach want to move beyond precious metals in order to make the domestic monetary system better able to mobilize domestic resources for economic prosperity.

The way resources are mobilized depends on the logic underlying the methods of issuance and redemption used by the issuer. Banks are oriented toward profitability as the key metric of financing economic activity, while governments do not have such a constraint but rather face real and political constraints. It is important for the issuer to recognize the relevant constraints it faces in order to properly use the monetary system. Understanding how to manage monetary systems on the basis of a financial logic took a while, especially so for tax-driven monetary instruments, because of the pervasive association between monetary instruments and precious metals. The following focuses mostly on tax-driven monetary instruments, for which there is less available literature, while bank-driven monetary instruments are mentioned briefly.

Taylor (1828) notes that imposing a tax liability on the population is necessary to maintain the purchasing power of the coinage, because such liability incentivizes people to sell resources to the government at the price set by the government:

> Every individual had to provide not merely for his own wants, but also for his share of the wants of the king,—as each man must give the required portion of his property or personal services, or something which the state agrees to receive in lieu of that property or personal service—, so money would then be of positive value, equal to the worth of that which it represented. (11)

The point of taxation is to incentivize people to accept coins as a means of payment for the goods and services they sell to the king. However, that does not mean that the tax liability can be whatever the king wants; real constraints and political capital are key determinants of the extent of the ability to impose tax debts:

> It is of importance to notice that the power of the Government to issue an increased amount of tribute money depends upon the power and consent of the people to increase their contributions to the state; and the people's ability to render these increased contributions depends, again, upon the productive powers of the nation being kept in regular and progressive action. (Taylor 1862, 247)

> we fully admit that there is nothing unreasonable in a landlord or a government requiring a share of the surplus produced, […] but to demand from a farmer *that* which his farm does not yield, or from the people *that* which their labor cannot command, is […] unreasonable […]. No power on earth has the right to demand impossibilities. […] As it is only in countries like our own, where the government is in good credit, being supported by an industrious and loyal people, that our system can be *efficiently* acted upon. (Taylor et al. 1832, 23–4)

If the tax burden is too heavy, people will leave or revolt and economic activity will decline: "Malmsbury says, that the taxes imposed upon the land in this reign were so heavy, that the farmers abandoned tillage, and a famine ensued" (Taylor 1828, 12).

In addition, in a tax-driven monetary system, government spending must come before tax collection, because tax collection returns to the government the monetary instruments it issued through government spending:

> The use of the *admonitory* instruments thus created is, *first*, to the receiving party, to enable him to *anticipate* the payment to which he is to be subsequently entitled. […] The first step in a monetary process is taken by the *receiving* party, who thereby *anticipates* a future payment of tax, or rent, or other debt […] [the admonitory instruments] are returned to the state in payment of taxes,—so all that is needful for the government to do, is to supply a sufficient number of Exchequer notes. (Taylor et al. 1832, 22–3)

As shown in Section 2.2.4.2, Taylor et al. (1832) note that government notes and coins are tax-anticipation bills so the tax collection is not what finances the spending. Instead, tax collection validates the expected redemption of the notes and coins used to finance government spending, which maintains their circulation at par. As Innes (1914, 160) puts it: "It is the issue of money which is the burden and the taxation which is the blessing."

This clearly contrasts with most monetary scholars and politicians who see government paper notes as something that only needs to be issued to cover a deficit of coins obtained through

taxation. For example, Rist (1940 [1966]) assumes that paper notes are issued to "meet government requirements for expenditures that cannot be covered with revenue" (133) and the idea of forced paper also follows along this line. For Taylor and others, it is a mistake to think in those terms and such reasoning is precisely why inconvertible paper currency failed. Government notes are not to be issued to cover a deficit of coins; they should be issued, like coins and any other monetary instruments, with the anticipation that they can be redeemed. All spending involves monetary financing, via coins, notes or otherwise. Taxation just redeems them and whatever is left is a net injection of monetary instruments that pushes down interest rates (Lerner 1943). Wray (1998; 2015) and Kelton (2020) have been the most recent exponents of that point.

In terms of net injection, scholars who recognize the relevance of tax redemption also want it to be very strong. They want the volume of redemption to match exactly the volume of issuance of monetary instruments so that the government runs a balanced budget (also Taylor 1862, 247):

> if it be irredeemable [NB: he means inconvertible] and issued by a ruling power, [...] however wise it may be for a Government sometimes to anticipate the receipts of the national revenue by the use of Exchequer Bills, those instruments should never exceed the current means of their being redeemed through the ordinary payments into the Exchequer. (Taylor 1862, 266)

John Taylor and Duncan make the same point and associate fiscal deficits with inflationary pressures:

> The whole amount would inevitably find its way back to the treasury, […] the tokens of expenditure would be exactly balanced by the token of receipt; and there never could be any surplus or deficiency in the revenue […]. The Money of the State could never be in excess […] through accumulation, because each annual issue would be annually cancelled; it could never be depreciated, because the crown would be pledged to take it back from the people at the same rate at which it was issued by the crown. (Duncan 1849, 12, 14)

> If it were to issue more annually than the annual taxes withdraw from circulation, the superflux would then become of less value, by which the next issue would be impaired in public estimation; less would be given for it in exchange, and yet the exchequer would be compelled to receive it at its nominal value in discharge of taxes. (Taylor 1836, 32)

None understood that a fiscal deficit—that is, a net injection of government financial instruments—may be required on a permanent basis to meet private needs (hoarding, transactions) and policy-making needs. As noted in Section 2.3, they do recognize that "tribute money" is used for other reasons than for paying taxes, but they do not see the necessary connection with a fiscal deficit. From their viewpoint, there is an incoherence between the need to tax to drive government monetary instruments, while also having a fiscal deficit to supply enough government instruments to meet of the needs of the economy. The recognition of this dilemma occurred in the monetary discussions among politicians of the Massachusetts Bay colony (Tymoigne 2014). Some feared that the confidence in the currency would fall if the notes issued were not all redeemed through tax collection, whereas others argued that the private sector wanted to hoard some of the bills and so not all bills could be redeemed to balance the budget:

> The retirement of a large proportion of the circulating medium through annual taxation, regularly produced a stringency from which the legislature sought relief through postponement of the retirements. If the bills were not called in according to the terms of the acts of issue, public faith in them would lessen, if called in there would be a disturbance of the currency. On these points there was a permanent disagreement between the governor and the representatives. (Davis 1901a, 21)

The tools needed to resolve this dilemma would not be available until the 1930s with the invention of national accounting and a proper understanding of the implications of sectoral balances (Keynes 1936). Such tools have been used most recently by Modern Money Theory proponents, who note that fiscal deficits are a stylized fact explained by the desire of other sectors to record a net accumulation of government financial instruments (Wray 1998; 2015).

Finally, if the government wants to impose more tax debts in order to draw more resources, it must issue more monetary instruments to meet the additional demand to pay the taxes; otherwise, regardless of availability of economic resources and political capital, the tax liability is impossible to settle with monetary instruments and economic activity will suffer:

> From what I have here laid together, we may determine, that as alienations among individuals cannot exceed the proportion of the circulating equivalent of a country, so a statesman when he intends *suddenly* to augment the taxes of his people, without their industry, which then becomes still more necessary than ever, should augment the circulating equivalent in proportion to the additional demand for it. (Steuart 1767b, 366)

It is important to make sure that the supply of "tribute money" is endogenous to meet the needs of:

> the productive powers of the nation being kept in regular and progressive action, which they cannot be kept without a free circulation of tribute money proportionate in amount to the increasing stores of the people, and proportionate also to any increase there may be in the amount of national revenue. […] The *duty* of the Ruling power, as well as the *privilege*, to provide the people with a circulation of *Tribute Money* proportional in amount to the national Revenue. To require from the poor people of Ireland, in Charles the Second's reign, a tax of 2s. in the king's Coin, when they had scarcely any means of getting the money, was an injustice. (Taylor 1862, 247, 256)

When monetary and fiscal powers are separated, this means that there must be a coordination between fiscal and monetary authorities in order to have a well-functioning tribute money:

> The Government was enabled by the co-operation of the Bank of England to provide the people with a circulation of Tribute Money quite equal to the increase of the National Revenue and the increasing productions of labor; and to do this without much difficulty *prior* to 1774. (Taylor 1862, 256–7)

James Harvey (1865) argues that the American Revolution was partly caused by this lack of monetary instruments accepted by the English government in tax payments:

> The revolt of the British Colonies in America has generally been attributed to an attempt by the mother country to levy taxation; but this idea requires correction. It was not so much the levying of taxation by England that roused their indignation, as the attempt to raise it in silver and gold, and the refusal to take their local paper. Now, as there was but little silver and gold in the Colonies, this was to attempt an impossibility. (14)

Knapp notes that a government can further improve the stability of the monetary system by broadening the types of monetary instruments accepted during tax collection beyond government-issued monetary instruments (Knapp 1905 [1924], 145, 155). Overall, the anti-Bullionists and their followers had a good understanding of the way to manage such a tax-driven system, except for the necessity of letting the fiscal balance adapt to the needs of the economic system.

In terms of bank-debt-driven monetary instruments, the emphasis has been to ensure that banks have a credit policy that sustains income growth. For Tooke and Fullarton, laissez-faire ensures that banks have an incentive to meet the needs of commerce while existing as a going concern. For Minsky (1986), Fisher (1933) and Commons (1934), among others, laissez-faire leads to instability as banks lower their credit standards during periods of stability to sustain market shares and profitability, and raise their credit standards during a crisis. This means that it is necessary to manage the underwriting criteria used by banks. They should move them away from collateral-based credit toward income-based credit in order to promote financial stability (Minsky 1986, 233).

3. **A SIDE NOTE ON CHINESE MONETARY THOUGHT**

Antiquity to Renaissance Chinese monetary systems are odd for Aristotelian scholars. Gold and silver coins were conspicuously absent at times. Copper and iron coinage were common and the widespread use of paper notes by private and government issuers emerged much earlier than in

Europe. This suggests that the monetary thinking of Chinese scholars was quite different, and indeed it was. Von Glahn (1996, 25, 34–8) notes that the early dominant Chinese monetary thought was Chartalist—in the narrow sense that "currency [is] an artefact of imperial will" (45)—with a synthesis of "theoretical Chartalism" and "practical Metallism" during the Han Dynasty. Thierry also notes that Chinese intellectual and political views on monetary affairs are mostly on the side of a Chartalist—in the broad sense of token—understanding of monetary instruments with some exceptions that emphasize weight (Thierry 1991; 1993a; 1993b; 2017, 47, 49, 189). He then concludes that:

> These coins are really metallic notes with a nominal value that rests only on the confidence in the government, on the reciprocity of use at the official value, and on the overall agreement of the population. (Thierry 1993a, 6)[70]

The dominant view is equivalent to the Platonic European view, one that emphasizes chartality, Nominalism, and command. Available records, via the *Guan Zi* (a philosophical compendium that includes economic and monetary thoughts), point to the development of monetary thoughts during the Zhou dynasty (1046BC–256BC). The Legists and Confucians, through their debates, were major contributors to Chinese monetary thought (Xinwei 1965; He 2024). The origins of monetary systems are found in the "husbanding of the state" (Xinwei 1965 [1994],94) and coins are important because the king uses them (Xinwei 1965 [1994], 77), which promoted the monetization of the economy. Yang Yuling (楊于陵) (753–830) argues that the origins of monetary systems are found in the state's will to obtain resources:

> The kings regulated coins so as to exercise sovereign control over the multitude of goods, and so that trade could move things from those who had them to those who did not. (Yuling, in Xinwei 1965 [1994], 312)

[70] « Ces monnaies sont de véritables billets métalliques dont la valeur repose uniquement sur la confiance dans le gouvernement, sur la réciprocité d'usage au taux légal et sur l'agrément général de la population. »

During the Han Dynasty (202BC–220AD), legists accept Nominalism and note that fiat can set the face value of a coin, but only "if the government accepted it at the given price, its face value could be preserved" (Xinwei 1965 [1994], 177); that is, fiat alone will not do, there must be redemption channels to enforce fiat. If this is done regardless of the quality or weight of coins, the population will be far less concerned with material reliability when circulating coins,[71] as noted in Europe in Section 2.2.3.2, and indeed unearthed hoards suggest that the population did not discriminate during at least some periods of time:

> Discrimination of coins by the population is only justifiable if the state also discriminates among the coins that it receives in taxes, fees, fines and diverse payments; however, the *Jinbulü* clearly states that state employees must not discriminate among coins, but must accept them and put them together, pretty or not. (Thierry 2017, 65–6)[72]

As such, one can speculate that one would have observed what happened in early modern England when new and worn gold and silver coins all circulated at par without being weighed.

However, the implementation of a tax-driven monetary system was ridden with mistakes. Typical mistakes made by the government included limited or absent redemption channels, redemption at a discount, a scarcity of monetary instruments necessary to pay the tax dues, discrimination among government instruments accepted at redemption (Thierry 2017; Von Glahn 1996). Such mistakes must have prevented the circulation of monetary instruments at face value and must have limited the ability of the government to obtain resources through the monetary system.

A mistake that is revealing of the government officials' conception of monetary instruments as mere tokens "not intended for speculation, but for circulation" as Attwood put it, is, at times, the

[71] Although some may still keep an eye for outlier coins that are of much better quality or have a much higher intrinsic value than face value; once again, the current pre-1982 penny discrimination in the United States is an example of such behavior among a limited segment of the population.

[72] « Le tri des monnaies par la population ne se justifie que si, de son côté, l'État se livre, lui aussi, à un tri parmi les espèces qui lui sont versées en taxes, impôts, amendes et paiements divers ; or, le *Jinbulü* dit clairement que les fonctionnaires ne doivent pas trier les pièces, mais les accepter et les mettre ensemble, belles ou non »

complete lack of care for the ratio between face value and weight of coins made of the same metal. First, the weight of a coin of a single denomination varied widely, which one can blame in part on the lack of proper production techniques, but also suggests that weight was not that important of a feature for the government officials. The symbols on coins were more important to show the type of coin and, at times, face value. Second, coins of different denominations made of the same metal would not have a proportional weight. For example, during the Han Dynasty, coins worth 50 wens[73] called *da quan* weighed approximately 12 zhus (a weight unit, 1 zhu equals roughly half a gram) while a coin worth 5 wens, called *wuzhu*, weighed approximately 5 zhus. One could melt 5 *wuzhu* coins to get 25 zhus of copper that could be minted into two *da quan* coins; thereby making a capital gain of 75 wens (Thierry 2017, 121). Such mistakes are repeated time and time again during the Han, Song, Ming and Qing dynasties (Thierry 2017, 328, 385, 336–437).

Legists were proponents of a centralization of minting and a monopolization of the material used to make coins. Legists made a clear difference between the unit of account and monetary instruments. Amazingly, like Paulus and Medieval legal scholars, the word "quantity" is used to mean the face value of coins, and there is a recognition that the law sets that quantity. Du You (杜佑) (735–812) states:

> The significance of the original establishment of a coinage was truly deep and truly far-reaching. Of all the myriad of things, there is none which is without its quantity. Since they have quantity, then it is necessary to establish one thing to be their master. (Du You in Xinwei 1965 [1994], 309)

Dai Zhi (戴埴), who lived in the middle of the thirteenth century, argues, like Hotman did 200 years later, that coins and paper notes are just tokens:

[73] The wen seems to be the unit of account although Chinese scholars are not always clear on what the unit is when they present historical cases.

> Dai roundly condemned the Southern Song government's wanton abuse of fiat money; but he concluded that paper money was no different in kind than coin. Both paper notes and coin, Dai insisted, were "useless" substances employed as tokens to facilitate the exchange of useful commodities. (Von Glahn 1996, 45)

Hu Zhiyu (胡祇遹) (1227–93) also emphasizes the point that coins and notes are token and the role of issuer's creditworthiness for acceptance: "[The] utility of paper money as a substitute employed in the exchange of goods rest solely on its creditworthiness, its creditworthiness lost, none will accept it" (Von Glahn 1996, 63). He was critical of the lack of conversion of Yuan notes into silver ingots because this lowered their acceptance.

Overall, Chinese monetary thought was in advance of its European counterpart in terms of the development of the Chartalist-Nominalist-Command approach (He 2024). The development of Trade with Europe and the colonization of China by European countries had a dramatic impact on Chinese monetary praxis and thought. European countries forced China to move toward a silver coinage (in part because it served as stable source of demand for the silver output produced by the mines exploited by Europeans in the Americas) and the Aristotelian approach took over (Von Glahn 1996; Thierry 2017, 421, 458).

CONCLUSION

The paper provides an overview of the intellectual history of a monetary analysis grounded in chartality instead of materiality, Nominalism instead of Metallism, and command instead of market. The history about the origins, debates, progresses, and errancies of such an approach is long overdue. It is rich of insights and lessons but is mostly absent in the major work on the history of monetary thought. The Platonic approach changes the way monetary analysis is done by developing its own categorizations, its own conceptualization of monetary problems, its own methods of inquiry, and its own theoretical understanding of monetary questions. All monetary instruments are fiduciary (i.e., involve confidence in the issuer), all are tokens (i.e. they embed a promise of the issuer), none have ever been mere commodities although some were secured by

precious metals, and fiat alone cannot make an instrument circulate at par. The analysis of the evolution and impact of trust in the issuer is a core focus of monetary analysis. The nature of the promise embedded in monetary instruments is studied together with the means necessary to manage the fulfillment of such a promise, as well as the impacts of the success or failure of such management. All of this changes the way monetary history and theory are done as well as how monetary management ought to be directed. Coins are just one among many monetary instruments and there is nothing special about them. The history of monetary systems starts long before the emergence of coins. The detection of the presence of a monetary system is not based on the analysis of functions performed by a circulating thing, but rather on the identification of the search for an issuer and how it manages the issuance and redemption of what it issues. The study of the power relations created by monetary relations is a core element of monetary analysis.

The central point of chartality is that monetary instruments work within the logic of finance instead of the logic of production; they are one among many financial instruments. Although "chartalism" has come to mean state-driven monetary systems, it is not what the scholars who developed that theory intended; "chartal" just means "token." The important point is that, given that a token contains a promise made by its issuer, the issuer must manage the issuance and redemption of its tokens in a way that is consistent with what it promised. As such, the valuation of all monetary instruments is influenced by the confidence of bearers in the creditworthiness of the issuer; that issuer can be a state, a king, a bank, a locality, or a seigneur, among others. Chartality widens the analysis of monetary instruments beyond governments and banks while also restricting such analysis to things with financial characteristics to avoid confusing monetary transactions, bilateral trade, and generalized barter.

Nominalism is a legal position that states that a financial debt is merely a promise to pay some digits, a nominal/numerical reward of unspecified (and usually unstable) purchasing power (contrary to Valorism) and unspecified quantity of precious metal (contrary to Metallism); that reward can take many forms, some physical, some abstract—such as commodities, monetary instruments, stocks, bonds, among others—as long as what is tendered in payment is worth the nominal sum due and the creditor agrees (unless the thing tendered is a legal tender).

Nominalism implies that monetary instruments should be valued at their current face value during debt settlements, regardless of what the intrinsic value is and regardless of what their face value was at issuance. Put differently, the sums due cannot be adjusted for changes in purchasing power, changes in metal content of the coinage, or changes in the face value of monetary instruments. Nominalism was first applied to private contracts but ultimately had to be applied to tax collection to ensure consistency in public and private debt settlement practices.

Nominalism and Chartalism are complementary core principles to organize and manage a monetary system. Nominalism sets the rule about what it means to pay a debt and how to value monetary instruments during debt settlements, while Chartalism implies that monetary instruments ought to circulate by tale not by weight. This organization of the monetary system is not merely a legal position, or a "nominal illusion," but has tremendous implications for economic analysis that have been taken seriously by scholars who followed the Platonic approach. Such scholars have sought to understand how monetary outcomes impact economic decisions and the management of monetary systems. This does not mean that they are dismissive of purchasing power concerns, but rather that these concerns are complementary sources of inquiry to the financial concerns that influence economic decision-making processes. Liquidity, solvency, and profitability are nominal concepts, not real concepts, and they demand a financial instrument with a perfectly stable nominal value and, thus, a specific monetary management. Once this is understood, one can develop a theory of interest rate, of the price level, and of the link between economic activity and the monetary system, among other important topics of monetary inquiry.

Nominalism and Chartalism were present in Europe and China very early on. They were core elements of Roman economic thinking but disappeared in the Dark Ages with the collapse of fiscal power. They reemerge as fiscal power grew reliably from the twelfth century but encountered strong resistance from creditors who valued precious metals and from scholars who worked under the premise of the commodity theory. Understanding the full implications of Nominalism and Chartalism and building a monetary system based on these principles took a long time and was plagued by mistakes. A monetary system that does not rely on precious metals is not arbitrary, but rather demands that some concrete steps must be taken for it to work

properly. These steps aim to boost the creditworthiness of the issuer so as to widen the area of acceptance at par of its monetary instruments. Each of these steps involves managing trust and power relations in order to promote socio-economic-political stability. Within that framework of understanding, precious metals may have a role to play in case creditworthiness is compromised, but that comes at the cost of a lack of flexibility in the monetary system.

The emergence of cryptocurrencies has led to similar mistakes but their proponents have used an Aristotelian approach to monetary analysis, while also arguing that cryptos do not rely on trust and power. This is probably the single biggest conceptual mistake at the foundation of crypto currencies; all monetary systems rely on trust and power given their nature. The point is to manage them, not to bury and ignore them.

APPENDIX 1: Intrinsic, Official, and Market Values of the Penny and Guinea Coins

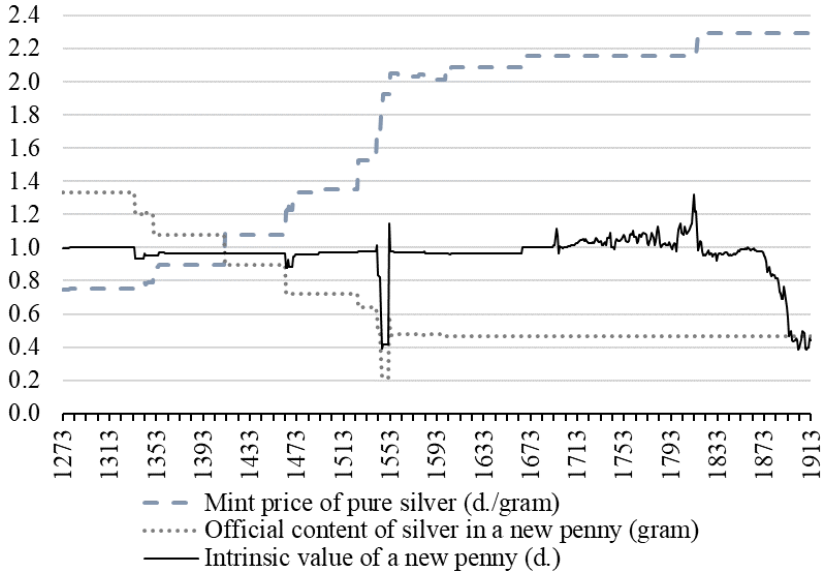

Figure A1.1. Intrinsic value of penny coin, eebasement and price of silver

Sources: Bolton (2012), Redish (2000), Jastram (1981), author's calculations for intrinsic value.

Note: The mint price of silver is used from 1273–1692 to calculate the intrinsic value, the market price is used from 1693 when available.

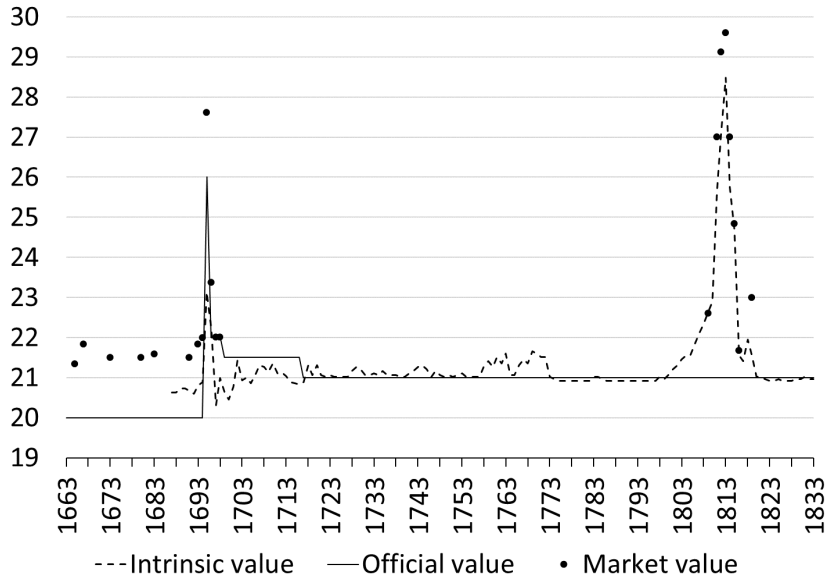

Figure A1.2. Values of the guinea coin, 1663 to 1833 (Shillings)

Sources: Li (1963), *Cobbett's Political Register*, Redish (2000), Jastram (1981, 2009), Officer and Williamson ('The Price of Gold, 1257–present,' *MeasuringWorth*, 2018), Horsefield (1960), Stride (1955), Rogers (1866).

Note: Data about the market value outside the 1693–97 period is scattered over many sources and usually limited to one random month of the year. Weekly market values are available for the 1693–97 period.

APPENDIX 2: Price of Wheat in Roman Egypt 25 AD to 370 AD

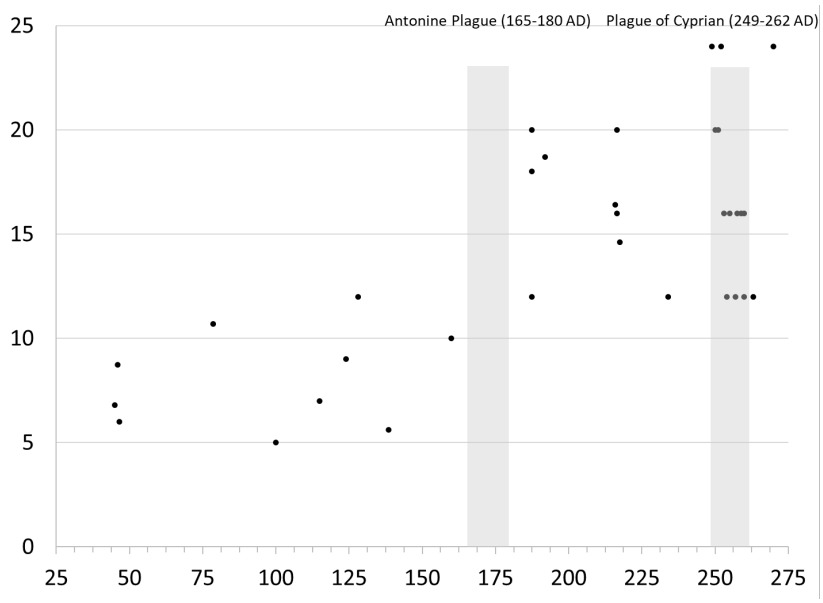

Figure A2.1. Nominal Price of Wheat, 45–270AD (Drachma per Artabas)

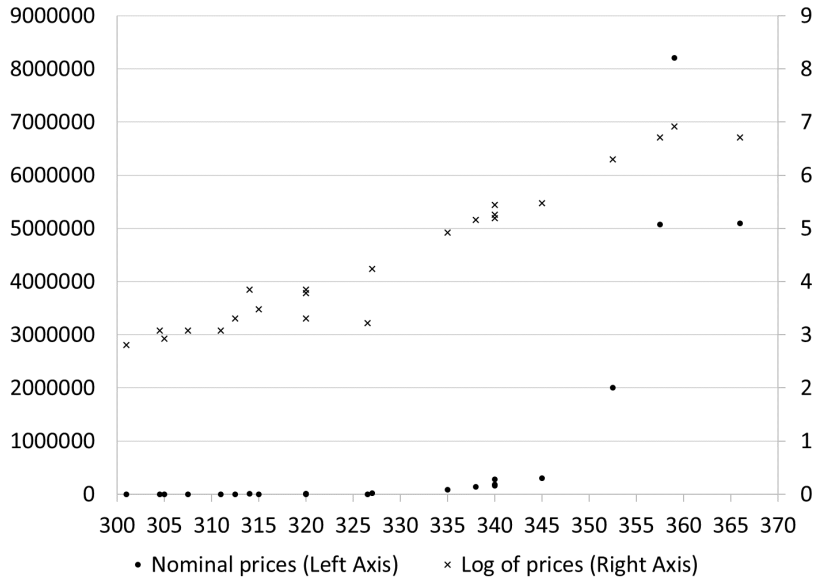

Figure A2.2. Nominal Price of Wheat, 300–70 AD (Denarii per Artabas)

Source: Harper 2016.

APPENDIX 3: Precious Metal Content of Several Roman Coins

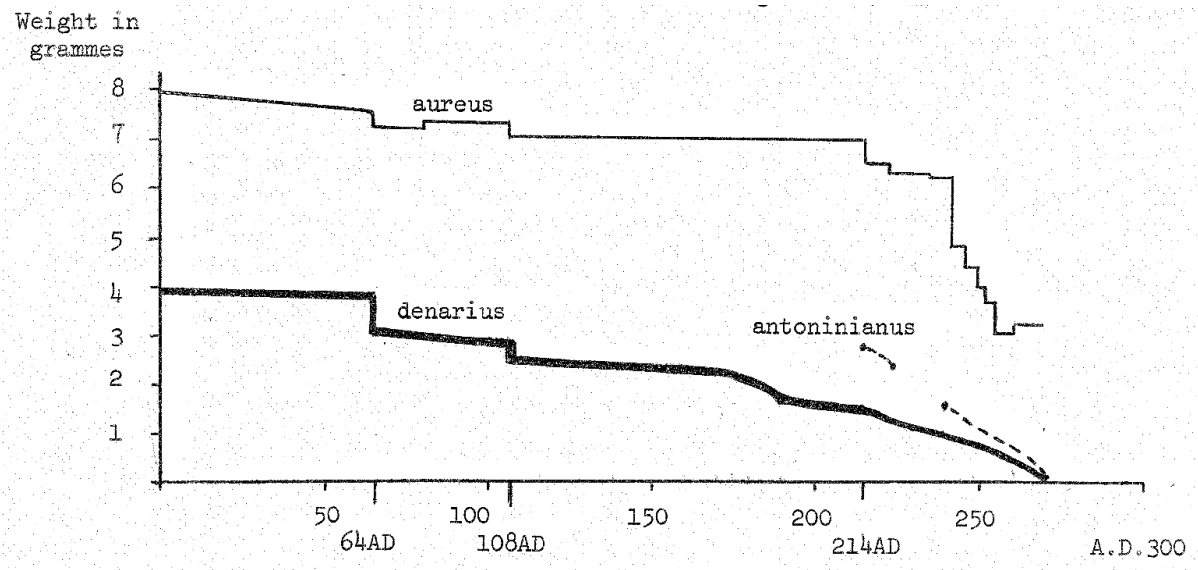

Figure A1.1 Actual weight of the aureus and weight of silver in the main Roman silver coins

Source: Brown (197?)

APPENDIX 4: Purchasing Power of Gold and Silver

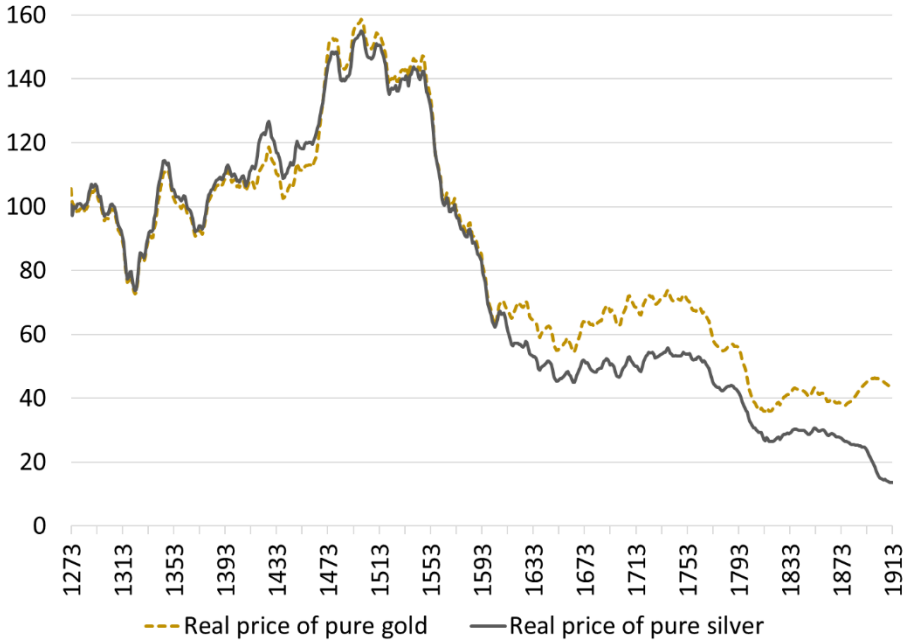

Figure A3.1. 10-year moving average of the real price of pure gold and real price of pure silver (Base 1273–82)

Sources: Redish (2000), Jastram (1981), Officer and Williamson ('The Price of Gold, 1257–present,' *MeasuringWorth*, 2018) and Allen (CPI for London)

Note: Market price of metal is proxied by the mint equivalent from 1273 to 1342, by the mint price from 1343 until market prices are available (1693 for silver, 1687 for gold).

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