
A structured approach for comparing monetary theories

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Abstract: This article presents a structured approach for comparing monetary theories based on their primary monetary function. The proposed taxonomy clarifies and highlights the underlying assumptions of selected monetary theories and applies the derived lines of thought to historical examples. The advocated line of thought is a normative decision regarding the relative importance of the different functions. According to the 'store-of-value' line of thought, the conservation of purchasing power is the most relevant function. The 'medium-of-exchange' line of thought maintains a stable monetary value in the circulation of goods and services. The 'means-of-payment' line of thought emphasises an active role of money and the possible influence of the society on money and the economy. In contrast, the 'unit-of-account' line of thought reduces money to a passive role, adjusting elastically to the needs of the real economy. While no taxonomy can be comprehensive enough to include any specific monetary theory, our approach explores monetary theories by asking relevant questions and contextualising them.

Keywords: monetary theory; functions of money; taxonomy of monetary theories; history of economic thought.

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1 Introduction

Since the financial crisis of 2007/2008 the existing order of the monetary system has faced increasing scrutiny: The sovereign money initiative (also known as the Vollgeld initiative) based on Irving Fisher's work on 100% – money; modern monetary theory (MMT) (based on the ideas of Georg Friedrich Knapp), which argues for fiscal funding by central banks; and cryptocurrencies based on the works of Carl Menger, Ludwig von Mises and Friedrich August von Hayek to help stabilise the money supply. These initiatives reflect a deep distrust in the existing order of the monetary system.

Revisiting these theories and making them relevant to current monetary debates is a valuable research endeavour. The objective of this article is to develop a structured

approach to explore and compare the main assumptions of monetary theories to identify lines of thought¹ based on their central monetary functions.

This objective has been intensively discussed in literature. For example, the nature of money was examined by Altmann (1908). Long-standing and intensive discussions about Knapp's (1905 [1924]) *State Theory of Money* differentiates monetary theories into metallistic or nominalistic theories (cartalism). Additionally, the currency-banking school dispute in mid-19th century England focused on relevant monetary aggregates. This paper synthesises these different monetary classifications using monetary functions as a starting point and extends it to current monetary theory. Ehrlicher (1965) serves as a starting point for this paper, whereby monetary theories provide explanations for the nature/essence and value of money. For Ehrlicher, these two concepts are interconnected: the explanation of the value of money must be derived from the nature of money. We further extend Ehrlicher's taxonomy to include (private) credit money theories.

The limitations to this approach must be emphasised from the start: One, empirical manifestations or concrete money forms that exist (or existed) are not the subject of this comparison. Two, our approach also does not introduce a new theory, nor does it impugn existing theories; rather, we will conduct a structured comparison of existing theories to clarify and make visible the underlying assumptions and traditions. Considering the wide range of monetary theories, no taxonomy can be fully comprehensive. The presented categories in this paper are subject to overlap and are contingent on different perspectives. Therefore, our proposed approach serves the purpose of comparison and discussion.

2 Historical approaches to classification

The usual division of economics into schools of thought, typically based on value/price theory or historical periods, is not adequate for analysing monetary theories since common monetary ideas can be found in different schools of thought. During the Mercantilism period, for example, there were advocates of the commodity theory of money, i.e., Mun (1664) and Justi (1766), and advocates of the quantity theory of money, i.e., Locke (1692) and Davanzati (1588 [1696]). Similar emphasis on money as a commodity can be found in Menger's (1909 [1970]) neoclassical thinking and the socialist thoughts of Marx (1867). The idea of an endogenously created nominalistic money can be found in Mercantilism (Galiani, 1751 [1977]), the classics (Tooke, 1844), and the German historical school (Schumpeter, 1918).

Therefore, an alternative classification was needed for monetary theories, with several attempts made starting in the 19th century. An obvious distinction of monetary theories is how money is defined. A narrow definition of money as currency, which means physical or state money, contrasts with the broader, liquidity-oriented definition, which includes money surrogates, such as liquid forms of credit (credit money): "from the beginning of the 19th century to the present day, two fundamentally different views of money have dominated the discourse: one assumes a narrow monetary concept, and the other also treats the so-called money surrogates as influencing monetary variables" [Claassen, (1980), p.1; own translation]. This division is based on the mid-19th century currency-banking school dispute in England, where 'quantity-oriented' representatives of the currency principle and 'liquidity-oriented' supporters of the banking school competed against each other.

The best-known classification of monetary theories is nominalism v. metallism:

“By theoretical metallism we denote the *theory* that it is logically essential for money to consist of, or to be ‘covered’ by, some commodity so that the logical source of the exchange value or purchasing power of money is the exchange value or purchasing power of that commodity, considered independently of its monetary role.” [Schumpeter, (1954 [1997]), p.274; emphasis in original]

Metallism does not necessarily refer to metals but commodities that are used as money, which for practical reasons were mostly precious metals. Nominalism (cartalism)

“May best be defined by the corresponding negatives. Thus, we shall speak of theoretical cartalism wherever we find denial of the proposition that it is logically essential for money to consist of, say, gold, or to be promptly convertible into gold...” [Schumpeter, (1954 [1997]), p.275]

This easy classification, however, was too simple to effectively classify monetary theories.

In 1908, Altmann classified monetary theories according to the questions they raised. He distinguished between qualitative-static theories, which investigate the nature/essence and monetary functions, and quantitative-dynamic theories, which investigate monetary value and why it changes. Theories about the nature of money are closely tied to the origins of money. According to Altmann, the nature of money refers to the preconditions that an object must fulfil to be able to execute monetary functions, i.e., the qualitative level, which then forms the basis for the value of money.

In 1934, Ellis conducted a synthesis of classifications. As an advocate of Knapp’s nominalism/cartalism, and thus well acquainted with the latter’s taxonomy of money (Knapp did not develop a monetary theory taxonomy), Ellis (1934) classified theories into nominalistic and metallistic. Additionally, he utilised Altmann’s separation into the nature and origin of money from theories on the determinants of the purchasing power of money. Ellis used terms like ‘formalistic’ and ‘naturalistic’ to describe the nature of money, and ‘authoritarian’ and ‘economic’ to describe monetary value theories [Ellis, (1934), p.11].

In contrast to Knapp’s work, von Mises separated catallactic v. acatallactic theories. The former means “to locate the nature of money in circulation” [von Mises, (1917), p.199; own translation] and “explain its value in the form of the laws of exchange” [von Mises, (1917), p.199; own translation]. Catallactic theories are accessible to economic value theories and, thus, economic theories in a narrower sense. In contrast, the latter means seeking legal, historical, or sociological justification for money. Knapp viewed barter as irrelevant to the emergence of money and that the state alone has the power to determine, by proclamation, legal means of payment, and thus money. Von Mises (1981 [1924], p.509) argued that his theory was not accessible to economic value theories, noting that “never has there been a more miserable and empty representation of monetary history.”

3 Structure based on monetary functions

The functional approach is the most common starting point for monetary theories. Most textbooks define money based on its four functions:

- Medium of exchange – Money serves an intermediary good in trading, intended to simplify an exchange by an intermediating good as a commodity in circulation.
- Means of (deferred) payment – Money serves as a standard of deferred payment used to give credit or pay debts. It is not about the exchange of goods and services, but the necessary financial transactions required to allow an exchange to fall apart in time and value.
- Store of value – Money is used to transfer purchasing power from present to future. The differentiation between money, used to store purchasing power, and other assets, used to achieve revenue, is the degree of liquidity.
- Unit of account – Money is used to compare the value of commodities and control economic operations. In this role, money serves as a unit of account to facilitate the comparability of the value of commodities. This forms the basis for controlling economic transactions.

Accordingly, Ehrlicher (1965) classified monetary theories based on the nature of money in the narrower sense of currency, assigning monetary theories to their most relevant function. He classified against the background of the literature as discussed above.

The identification of the primary function of a monetary theory is not always apparent since monetary functions are often interrelated and cannot be separated. However, it is precisely this ambiguity that raises the question: What is the central problem or theme of each theory?

- If the nature of money is primarily determined by its function as a store-of-value, then the theory emphasises “the commodity character of money for its origin, function, and in particular, for its explanation of value” [Ehrlicher, (1965), p.233; own translation]. Such theories are metallistic, which means that “money (...) can only be a commodity where its value is protected by its intrinsic value, i.e., has a value that exists independently of the use as money” [Ehrlicher, (1965), p.233; own translation].
- If the nature of money is primarily determined by the medium-of-exchange function, then the theory views the primary role of money as the most merchantable commodity for intermediate exchange, i.e., the functional theory of money [Ehrlicher, (1965), p.233]. Thus, this theory emphasises that money must be a commodity; however, this commodity loses its original role in the usage as money.
- If the nature of money is primarily determined by its function as a means of (deferred) payment, then the theory is based on the legal setting or commercial usage that credit requires. For example, the convention theory of money, states that “money owes its origin and validity to an agreement of man [sic] to accept a certain good as a means of payment” [Ehrlicher, (1965), p.233; own translation]. This is the central aspect of Knapp and his cartalist tradition, wherein money is viewed as a ‘creature of law’ [Knapp, (1905 [1924]), p.1] and is created by a state proclamation.
- If the nature of money is primarily determined by the unit-of-account function, then the theory’s “focus is not on the individual concrete exchange, but on the abstract quantitative relations behind them on another logical level” [Ehrlicher, (1965), p.234; own translation]. For example, the token theory of money views money as a

coupon or certificate for a proportion of the production corresponding to one’s own contribution, similar to a cloakroom ticket. The nature and value of money does not lie in a concrete exchange, but in an abstract circuit-approach, which connects income, production, and prices.

Ehrlicher assumed a logical connection between the nature and value of money with the monetary functions. For example, if one considers the means-of-payment function as the most essential function of money, then the convention theory of money follows logically, and the monetary value is necessarily determined based on the quantity theory of money.

However, Ehrlicher’s approach has two main drawbacks. First, the assignment of theories to specific primary functions is not clearly feasible as these functions are often interrelated and cannot be separated. Second, the vagueness of the terms ‘commodity theory,’ ‘token theory,’ and ‘income theory’ may lead to misunderstanding, since these terms are not uniformly understood, even when more known.

To develop a taxonomy, these theories must be defined briefly as shown in Figure 1.

Figure 1 Taxonomy of monetary theories by Ehrlicher

	Metallism		Nominalism	
	Store of Value	Medium of Exchange	Means of Payment	Unit of Account
Theories on the Nature of Money (currency):	Commodity Theory	Functional Theory	Convention Theory	Token Theory
Theories on the Value of Money (currency):	Cost of Production Theory	Functional Value Theory	Quantity Theory	Income Theory

Source: Author

Utilising Ehrlicher’s (1965) approach as the starting point for developing a monetary theory taxonomy, the first step is to classify monetary theories into the nominalism and metallism categories as described earlier. The store-of-value and medium-of-exchange functions are both connected to metallism since both require money to be a commodity, while the means-of-payment and unit-of- account functions do not. Focusing on currency, i.e., disregarding private credit money, Ehrlicher added another classification, created by Altmann (1908): the nature/essence of money v. the value of money.

3.1 Nature of money

3.1.1 Metallistic theories on the nature of money

3.1.1.1 Commodity theory

In the commodity theory of money, precious metals form the crux of the monetary system, and their value is determined according to an objective value theory [Brandl, (2015), p.31f]. Precious metals, like other commodities, are subject to economic laws and, therefore, cannot have a monetary value independent of the value of the coin as

metal [Stavenhagen, (1969), p.419]. All theories that emphasise the nature of money in its physical properties, emphasise money's function as a store-of-value. According to Roscher (1897, p.331; own translation), "false definitions of money can be divided into two main groups: those considering it to be more than and those considering it to be less than a commodity."

3.1.1.2 Functional theory

The functional theory of money describes the nature of money not by its physical properties, but by its use-value [Stavenhagen, (1969), p.421f]. The nature of money is viewed in its economic role, i.e., as a medium-of-exchange. Money is the most merchantable good that is used for intermediary exchange to surmount the coincidence-of-needs problem. Although this theory is metallistic, the subjective value theory applies here, i.e., the valuation of a monetary commodity based on its function of facilitating exchange [Brandl, (2015), p.32].

3.1.2 Nominalistic theories on the nature of money

3.1.2.1 Convention theory

According to the convention theory, money is not a commodity since it is created by the people's consent [Stavenhagen, (1969), p.418], i.e., social conventions form the basis of money. Hence, the physical properties of money are not specific to its nature but only represent a random historical phenomenon. Convention will normally be made by the modern state, whereby money becomes a legal tender. Therefore, money does not derive its value from barter. In this sense, convention does not mean that money evolves in markets, as in the functional theory of money, but as a social process governed by social norms.

3.1.2.2 Token theory

This refers to economic exchange in the circuit of money and goods. Accordingly, everyone receives a quantity of goods equivalent to their contribution to production in society. Therefore, money is considered a token or certificate of added value. Money is an instrument for the allocation of goods, just like a ticket at a theatre. This form of money can be without any intrinsic value but must be denominated with reference to a certain quantity of goods [Brandl, (2015), p.36].

3.2 Value of money

For Ehrlicher, the nature of money refers to why something is used as money, and why it has any value. The value of money refers to the mechanics of how value is determined. The value of money can be derived from the nature of money, and the logically following monetary value theories are a continuation of the previous function-related theories regarding the nature of money. Going beyond Ehrlicher, the question of whether the quantity of money is determined exogenously or endogenously is added.

3.2.1 Metallistic theories on the value of money

3.2.1.1 Cost of production theory

The cost of production theory is a monetary value theory that corresponds to the commodity theory of money [Ehrlicher, (1965), p.233]. Since money is a commodity, its value is also subject to general economic laws. The cost of production of each quantity of a commodity determines its value; thus, the value of money must also relate to its production costs [Stavenhagen, (1969), p.443]. Money cannot have any value independent of the value of the commodities used as money. Advocates of this theory worry about the manipulation of the money value (i.e., deviation from the value as a commodity, e.g., light coins with lower silver content as claimed) and its negative consequences.

The quantity of full coins in circulation will always be adjusted endogenously. When prices are low, it will be profitable to produce more gold, which, through its positive effect on the money supply, will raise prices until its expected profitability decreases to that of other goods. When prices are too high, the commodity used as money will leave monetary circulation.

3.2.1.2 Functional value theory

When the nature of money is related to its medium-of-exchange function, its value is determined by the utility received by using the money commodity as money. This value is based on its ability to circulate and its function as a medium-of-exchange, which refers to the purchasing power of money [Stavenhagen, (1969), p.421f]. And, as von Mises (1981, p.130) wrote,

“The subjective use-value of money, which coincides with its subjective exchange value, is nothing but the anticipated use-value of the things that are to be bought with it. The subjective value of money must be measured by the marginal utility of the goods for which the money can be exchanged.”

This functional value and cost of production theories both describe money as a valuable commodity, which is why both these theories belong to metallism. Since the value of money is explained in the functional value theory by its subjective-use value, an excessive quantity of money will reduce the use-value received from the commodity used as money and increase prices. However, the money commodity will not, as in the cost of production theory, leave circulation to serve its original purpose. Therefore, its quantity is limited to the availability of the commodity, meaning exogenously determined, since the quantity of money does not necessarily respond to fluctuations in the circulation of goods and services.

3.2.2 Nominalistic theories on the value of money

3.2.2.1 Quantity theory

From the perspective of the means-of-payment function, money is based on a convention, which is why money need not have an intrinsic value. Therefore, the value of money is determined by the amount of money in circulation vis-à-vis the volume of transactions.

The quantity theory of money is one of the oldest economic theories. Since the price revolution of the 1500s, it has established a causal relationship between the quantity of

money and the price level in various forms. The most common representation of this theory is Irving Fisher's equation of exchange, which includes the amount of money in circulation (M), the velocity of money (V, i.e., the frequency in which money is used for transactions), the transaction volume (T, or in the monetarist simplification, income Y), and the price level (P).

It is assumed that if V is constant, a more rapid increase in M vis-à-vis output leads to inflation. An exogenous change in the money supply leads to endogenous adjustments in the price level, which in turn, determines the monetary value (also known as the transaction volume quantity theory). Therefore, money is neutral regarding production and the 'classical dichotomy' applies [Issing, (2001), p.144f]. As Friedman (1970, p.11) concluded, "Inflation is always and everywhere a monetary phenomenon."²

3.2.2.2 *Income theory*

This theory rejects the one-sided causality between money supply and prices [Hildebrand, (1883), p.100ff], and assumes that changes in the money supply can only affect price levels when used for spending. Therefore, an effective money supply must be determined based on income levels and the disposition of income [Stavenhagen, (1969), p.444]. Thus, this theory is also known as the 'income type of quantity theory'. Subsequently,

"Not only the quantities of money determine the prices, but in principle also the prices determine the quantities of money (...), the purchasing power of money or the value of money depends on the quantity, but at the same time the quantity depends on the purchasing power of money." [Schumpeter, (1918), p.697f; own translation]

An exogenous change in prices, caused by real scarcities, will lead to an endogenous adjustment of the money in circulation. It is important to identify what money is used for, whether consumption or investment. Income spent on consumption leads to an elastic adjustment of money supply at market prices. As Tooke (1844, p.124) famously wrote:

"That it is the quantity of money, constituting the revenues of the different orders of the state, under the head of rents, profits, salaries, and wages, destined for current expenditure, that alone forms the limiting principle of the aggregate of money prices, the only prices that can properly come under the designation of general prices. As the cost of production is the limiting principle of supply, so the aggregate of money incomes devoted to expenditure for consumption is the determining and limiting principle of demand."

3.3 *Credit money theories*

Ehrlicher did not address quasi money or money surrogates and other types of currency substitutes (here generally referred to as credit money), although they are quantitatively the most significant types of money. Thus, to have a broader understanding of money, it is important to consider credit money theories as well.

Can the Ehrlicher classification, based on monetary functions, be extended to credit money theories? In principle, any form of credit money is a (potential) means of payment [Werner, (2014), pp.2–9]. However, in determining the value of credit money, monetary theories fall apart and can be assigned to primary monetary functions. Credit money theories also follow a specific understanding of the nature of the underlying currency.

Figure 2 Taxonomy of monetary theories for currency and credit money

	Metallism		Nominalism	
	Store of Value	Medium of Exchange	Means of Payment	Unit of Account
Theories on the Nature of Money (currency):	Commodity Theory	Functional Theory	Convention Theory	Token Theory
Theories on the Value of Money (currency):	Cost of Production Theory	Functional Value Theory	Quantity Theory	Income Theory
Theories on Credit Money:	Real Bills Doctrine	Covered Credit Money	Active Money Creation	Passive Money Creation

Source: Author

3.3.1 Metallistic credit money theories

3.3.1.1 Real bills doctrine

This is one of the oldest credit money theories, based on the use of bills of exchange, dating back to Smith (1776 [1828], p.236),

“When a bank discounts to a merchant a real bill of exchange drawn by a real creditor upon a real debtor, and which, as soon as it becomes due, is really paid by that debtor, it only advances to him a part of the value which he would otherwise be obliged to keep by him unemployed and in ready money for answering occasional demands. The payment of the bill, when it becomes due, replaces to the bank the value of what it had advanced, together with the interest.”

Here, credit only represents commodities and does not have an independent role. As long as credit is short-term, valuable, and risk-free, bills of exchange only represent commodities that are like the commodity itself, i.e., in the sense of the commodity theory, money. The volume of credit is determined endogenously by the goods and services in circulation, and the value of credit money depends on the value of the commodities that are represented by it, i.e., the value of bills of exchange depend on the circulating commodities.

3.3.1.2 Covered credit money

After the financial crisis of 2007/2008, calls for limiting the expansion of credit money were made. Under the gold standard, credit money was pegged to gold as a value-securing good. Banks held gold as a reserve for the lending or creation of paper money; thus, gold restricted the expansion of credit money. Banks are assumed to be pure intermediaries that collect deposits and lend them out as loans. Thus, the volume of credit money is determined exogenously by the quantity of the commodity attached to credit money. The pegging of currency to commodities like gold is essential in this theory.

3.3.2 *Nominalistic credit money theories*

3.3.2.1 *Active credit money creation*

These theories focus on money-creating institutions, especially banks. The creation of private credit money depends on bank initiatives and does not reflect any previous or simultaneous processes in the real economy, which are a reaction to the supply of credit by banks.

Credit does not passively follow the processes of a real economy despite all the restrictions (e.g., demand or the availability of collateral). In this sense, credit money is exogenously determined by banks [acatallactic, according to von Mises (1917, p.199)]. The best-known concept in this context is the money multiplier in the tradition of Phillips (1920).

3.3.2.2 *Passive credit money creation*

From this perspective, the creation of credit money is a complex issue between production, consumption, and the derived demand for credit. A bank's credit money creation tends to be passive and follows the demand and intention of non-banks to use credit money. Thus, credit money is endogenously determined by the behaviour of economic agents [catallactic according to von Mises (1917, p.199)].

4 **Applying the line of thought approach to selected historical theories**

As discussed in the preceding sections, lines of thought based on primary monetary functions can be identified. This taxonomy can be applied to historical monetary theories. The following selected examples refer to a specific text and not to the whole work of a writer, and were chosen to refer to an influential and illustrative case.

Theories where the nature of money is primarily based on its function as a store-of-value emphasise the commodity properties of money to explain the origin and value of money. This line of thought began with Oresmius (1361 [1999]) and was further promoted in Germany by Justi (1766). These authors represent a narrow and strictly metallistic understanding of money, wherein the state must guarantee its quality. Any other monetary policy is viewed as theft or acting against good faith. This line of thought results in a restrictive, stability-oriented monetary policy. It also rejects political projects to seek short-term advantages by manipulating money (Schefold, 2017).

Ricardo (1811) defended this monetary orthodoxy. His goal was the institutional safeguarding of a stable currency. While the circulation of full-value coins was not obligatory, its convertibility to gold generates the necessary credibility for stability [Marcuzzo and Rosselli, (1991), p.41ff].

Additionally, Marx (1867) assumed that a money commodity emerges within the circulation of goods and services. Marx advocated a metallistic monetary theory; however, money commodities, especially gold, could be replaced by monetary symbols such as gold representatives. As with all commodities, the value of a money commodity is determined by labour. The amount of money in circulation, whether gold is hoarded or used as coins, adjusts to the value in circulation and is therefore endogenous [Harvey, (2010), p.15ff].

Credit money only represents a commodity, as described by the real bills doctrine, introduced by Adam Smith and further developed by Tooke (1844) [see Arnon, (2011), p.227ff].

Theories wherein the nature of money is primarily determined by its function as a medium-of-exchange view the exchange of goods in a market as the origin of money. These theories view money as a valuable commodity, wherein its value, like with any other good, depends on demand and supply, and marginal utility from the usage of the commodity as money. This view characterises the Austrian school of economics, particularly the works of Menger (1909 [1970]) and von Mises (1981 [1924]) [see Álvarez and Bignon, (2013), p.93, p.113]. In such theories, the scarcity of money and not the concrete money form, i.e., the chosen commodity, is essential.

This scarcity is also important for credit money. Private credit money must be covered by the money commodity, whereby supply of this commodity is limited (e.g., by a ratio). This commodity must not be a precious metal. In 1705, Law sought to convert the Scottish silver-currency from a precious metal into a land-backed currency since this would be more stable and less abundant. He neglected the possible price effects of the rising money supply because he saw a sufficient limitation in the coverage of land [Murphy, (1997), p.76ff].

Theories wherein the nature of money is primarily determined by its means-of-payment function are based on the legal arrangements for credit, i.e., currency is credit. Money is created by social or legal regulation. Therefore, money can be viewed as ‘a creature of law’ [Knapp, (1905 [1924]), p.1] and be created by a state proclamation. This theory is based on the convention theory of money as first proposed in Bernardo Davanzati’s 1588 work [von Mises, (1917), p.199].

Hume (1752) explicitly formulated the quantity theory of money on an abstract level, assuming that the money supply has a causal impact on prices. The idea of the long-term neutrality of money with short-term non-neutrality as the basis for monetary policies, which is still dominant today, is mainly attributed to Hume [Blaug, (2001), p.155]. Today, Fisher’s (1911) equation of exchange is regarded as the embodiment of the modern version of the quantity theory of money (Dimand, 2011).

Private credit can be created actively and in an unlimited (theoretically) manner by banks in an acatallactic way [von Mises, (1917), p.199]. MacLeod (1892, p.326) was the first to explore active credit money creation, calling banks ‘manufactories of credit’. He rejected the notion that banks act as intermediaries and turned the explanation that money develops from exchange, meaning from barter to credit, upside down. MacLeod (1892) also deviated from the banking school, which saw the creation of money as reflecting the real economy (Skaggs, 1998).

Theories wherein the nature of money is primarily determined by its function as a unit-of account, view money as an abstract measure. In 1751, Galiani developed the concept of ideal money, which serves as a receipt to a producer of deposited commodities in a public warehouse, allowing this person to receive an equivalent amount of other commodities from the warehouse. Schumpeter (1918) and Bendixen (1908) further developed Knapp’s nominalism/cartalism in this catallactic direction, placing money creation as part of the economic circulation. Money is an instrument to control economic processes, and as such, is a token of economic output (Spahn, 2007).

Tooke’s (1844) *enquiry* is one of the most important contributions to banking theory. At a given price level, the quantity of credit money adapts in an elastic manner. The

quantity of bills of exchange, based on traded commodities, adapts elastically to the demand for money and automatically leaves monetary circulation after being redeemed. This ‘law of reflux’ [Fullarton, (1844), pp.66–68] stabilises the effects of the real bills doctrine since it limits the quantity of credit money that can be created. Tooke (1844) developed the income theory of money; however, due to historical circumstances and without considering banks; this theory views credit money through the lens of the real bills doctrine [Arnon, (2011), p.227ff].

Private credit money, issued by banks, is created in the interactions between banks and companies, and its volume is determined by aggregate demand. Schumpeter (1918, p.646) referred to this approach as ‘catallactic nominalism’. Wicksell (1907) used this approach to develop his cumulative process.

Figure 3 Application of the taxonomy to historical monetary theories

	Metallism		Nominalism	
	Store of Value	Medium of Exchange	Means of Payment	Unit of Account
Theories on the Nature of Money (currency):	Commodity Theory • Oresmius (1361) • Justi (1766)	Functional Theory • Menger (1909) • Mises (1912)	Convention Theory • Davanzati (1588) • Knapp (1905)	Token Theory • Gallani (1751) • Schumpeter (1918) • Bendixen (1908)
Theories on the Value of Money (currency):	Cost of Production Theory • Ricardo (1810) • Marx (1867)	Functional Value Theory • Menger (1909) • Mises (1912)	Quantity Theory • Davanzati (1588) • Hume (1752) • Fisher (1911)	Income Theory • Tooke (1844) • Schumpeter (1918)
Theories on Credit Money:	Real Bills Doctrine • Smith (1776) • Tooke (1844)	Covered Credit Money • Law (1705)	Active Money Creation • MacLeod (1892) • Fisher (1911) • Phillips (1920)	Passive Money Creation • Wicksell (1907) • Schumpeter (1918)

Source: Author

5 Conclusions

This article presented a structured approach for comparing monetary theories. It explored the underlying assumptions concerning the most relevant monetary function or monetary aggregate and applied the derived lines of thought to historical examples. Furthermore, the article addressed the deductions within a line of thought between the nature of money, the value of money, and credit money concepts.

The explored lines of thought are logical and consistent within their assumptions. The line of thought that one advocates is a normative decision regarding the relative importance of the different functions; the monetary function that may be the primary one is a normative decision. Political priors are reflected in this choice. The taxonomy should, therefore, not be read as a chronological development (e.g., from metallism to nominalism) as there is no progress. In contrast, all lines of thought continue into the present.

If a monetary theory considers the conservation of purchasing power as the most relevant monetary function, it follows the store-of-value line of thought. The focus is on

currency with a critical view of the expansion of central banks' balance sheets. A central bank should implement a hawkish, stability-oriented monetary policy.

Theories regarding the medium-of-exchange function focus on maintaining a stable monetary value in exchange. Advocates of the sovereign money initiative (Vollgeld) argued from this line of thought [Mayer, (2018), pp.79–92]. Moreover, Bitcoin advocates define this private currency as an artificially scarce money commodity that limits the money supply (Dodd, 2017).

The means-of-payment line of thought stresses the active role of money and the possible influence of society on money and the economy. Proponents of MMT associate the means-of-payment function with the definition of money as a social or governmental construction. Monetary financing of the state for the implementation of political objectives, such as the stabilisation of aggregate demand, leads to an exogenous money supply, meeting the needs of fiscal policy [Wray, 2015; Ehnts, (2016), p.30, p.57, p.223].

In contrast, the unit-of-account line of thought reduces money to a passive role, adjusting elastically to the needs of the real economy. Focusing on interest rates as policy tools of central banks assumes an endogenous adjustment of the quantity of currency and credit money.

The proposed taxonomy cannot be a fully comprehensive structure and the taxonomy does not consider the macroeconomic relevance of the different theories. The taxonomy entails overlapping and can be contingent on different perspectives of texts and authors. Nevertheless, this approach helps to examine monetary theories by asking relevant questions and contextualising them.

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Notes

- 1 By 'lines of thought' we mean intellectual traditions, like-minded people with similar ideas, influencing a specific way of thinking.
- 2 The presented definition follows Schumpeter who separates between quantity theorems, in which only the quantity of the money commodity changes, and the quantity theory, in which the dichotomy applies and prices would adjust proportionally to the quantity of, e.g., paper money. Therefore, any kind of metallistic understanding of money as with John Stuart Mill or Jean Bodin is not meant here [Schumpeter, (1954 [1997]), p.296ff].