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The money array; or, show me the debtor

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Abstract

Money is neither a thing nor a concept. Rather, as many writers have rightly suggested, money is a relation. But what kind of relation? This articles refuses the now seemingly common-sense notion that money is an 'institution' or a 'public good'. Instead, it insists on specifying money as a concrete relation between creditor and debtor. To grasp money in both its practical and conceptual complexity, we must see it as an array. The *money array* is comprised of four elements: (1) a *token* that symbolizes the money relation; (2) a *creditor* who holds the token; (3) a *debtor* on whom the token makes a claim; (4) a *denomination*, i.e., the named quantity of credit/debt. The money array makes clear that no form of the money stuff – as *money*, i.e., as part of the money relation – ever possesses any positive, intrinsic value. The raison d'être of the money stuff – of any coin, note, bill, check, or digital token – is not to contain, have, or incarnate value. *Money has no value*. The value element of the money relation never lies *in* the money stuff, but rather can only be located *across* the entire money array.

Keywords

Money array, credit, debt, crypto, derivatives, bank money

Introduction

It's been quite some time since anyone made a persuasive argument defending the commodity theory of money. When introductory economics textbooks fall back on that theory, they do so tacitly. When today's legitimate entrants into money-theory debates explicitly cite commodity theorists as foil for their own work, they turn back to the locus classicus of commodity theory, the still-unsurpassed texts of Stanley Jevons (1875) and Carl Menger (1892). Of course, one might refine the commodity-theory genealogy by tracing its roots much earlier (e.g., to Aristotle in the fourth century BCE), or one could render the theory ostensibly more 'rigorous' via mathematical support for the quantity theorem (e.g., in Irving Fisher's early

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twentieth-century work), but the fundamentals of the theory have not changed since the time of the so-called marginalist revolution in the late nineteenth century (Aristotle, 2017, 2019; Fisher, 1911). And one has to look hard today to find any legitimate economist, sociologist, anthropologist, historian, or political theorist willing to muster a defense of the commodity theory.

Despite this fact, it often feels as if commodity theory has never been defeated, its ghosts never vanquished, that no matter how much one might hear about 'fiat' money, the 'end of Bretton Woods', or the myriad ways that money is 'new' today – from MMT (Modern Money Theory), to crypto, to CBDC (Central Bank Digital Currency) – the core idea of commodity theory lives on. I am alluding to both the start and end points of commodity theory: the simple, powerful, and persistent notion that *money has value*. Metallism[1] tells us that money is value incarnate: to hold money in your hand is to possess value more fully and directly than one can at any other moment of life within a capitalist society. The commodity theory of money offers an origin story in which a commodity of intrinsic value comes to be designated as money within a society. Money therefore has value directly because *a commodity is money*;[2] money is nothing more or less than the commodity designated to carry out so-called 'money functions' (means of exchange and payment, store of value, and index of price/value).

On the surface, none of today's post-Keynesian, sociological, or neochartalist theorists of money buy this story. And, lest there be any confusion, on the grounds of a critique of commodity theory, they all build superior accounts. Members of this diverse group all reject commodity theory's historically untenable and logically circular account of money's origins. In its place they provide a more historically accurate narrative of money practices and institutions developing alongside and entangled with social and political developments. They also have on their side the last half-century of money practices, during which explicit defenses of the commodity theory have faded, and the only commodity basis for most money tokens is the computer hardware that supports entries into digital databases. Across their numerous and often radical differences, these theorists all stake out their decisive opposition to commodity theory. Indeed, most explicitly found their accounts on the ruins of commodity theory.

Attacks on the orthodox theory of money[3] no longer serve a purpose, because commodity theory is well and truly dead. Accordingly, this article concerns itself with those unvanquished ghosts. This is not at all to say that today's best money theories are varieties of commodity theory, but rather to suggest that despite their explicit rejection and refutation of commodity theory they retain one of its core tenets – namely, the governing idea that money has value. This can take numerous forms – from the notion that state declaration endows its pay tokens with value, to the hypostatization of a category of credit as pure positivity, to a variety of tactics by which money represents a positive value established elsewhere (in labor, in the community, and so on; see Schumpeter, 2006 [1954]; Schumpeter, 1956; Kelton, 2020; Lawson, 2016; cf. Ingham, 2018). Regardless of the mechanism, we still witness the reappearance of money as value. Hence my overarching claim: *money has no value.* To grasp why this is the case – and to see how it leads to a distinct theory of money – requires drawing out a series of elements that distinguish this account of money from today's best-known alternatives to commodity theory. I advance this project by defending a set of theses about money, beginning with the first, and central claim of the article.

Money is an array

The commodity theory, along with all functionalist accounts of money, assumes that money is an empirical object – a thing. This assumption is false. It will always lead us astray in trying to

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capture the nature of money. Keynes, most famously, proves both points by insisting on a distinction between *money proper* as the empirical 'thing' (this $20 bill) and *money of account* (pounds or dollars) as the "description or title" of money. Keynes asserts that the latter – money of account, or the 'title' of money, or *denomination*[4] – serves as the "primary concept of a theory of money" (Keynes, 1930: 3). He means that a 1 shilling coin or a cheque written for £20 (money proper) can only be intelligible as money within a system of pence/shillings/pounds (money of account).

By refusing the empirical reduction of money to the money stuff, Keynes frees his readers to reject not only functionalism but also any theory that would derive money's nature from examination of the money token. We will find the essence of money neither in a chemical analysis of a silver coin nor in a bare description of how and when that coin was held (as store of value) or changed hands (as means of payment, medium of exchange). Geoffrey Ingham has built powerfully on Keynes's initial insight in order to repeatedly diagnose the problem of conflating the money thing (money stuff) with *moneyness*. Ingham calls this a basic category error: forms of money cannot themselves stand in for moneyness (Ingham, 2004: 9).

Keynes' first move is invaluable: he was right to draw the distinction between the money thing and moneyness. But his second move is a misstep: Keynes was wrong to call "money of account" the "primary concept" of money – wrong to suggest that in locating dollars and cents (or 'dollarness') we would find the key to money. Keynes encourages many of his readers to make a different category error: the identification of moneyness with money of account. Contra Keynes, money of account cannot be *primary* because denomination does not itself provide a fully developed theory of money. The denomination *euros* is not 'money'. Euro is a measure of credit/debt, but just as we must not mistake the empirical artifact of a €20 note for moneyness, so we must not mistake the name or concept 'euros' for moneyness. The *nature* or *being* of money lies neither with concrete money tokens nor with the abstract idea of money of account.

Money is neither a thing nor a concept; rather, as many writers have rightly suggested, *money is a relation*. The key lies in explicating the kind of relation money is. The standard set piece involves: first, describing money as a social or political relation; second, situating these money relations within the context of a larger social or political theory; and finally, explaining money by way of this broader theory of society or politics. The process often results in the redescription of money as a type of social or political 'institution', or as a 'public good' (Aglietta, 2018: 67; Aglietta and Orléan, 1998; Ingham, 1996: 516; Ingham, 2000: 26; Wray, 2004: 245; Eich, 2022: 213).

In an effort to rethink the money relation on its own terms, I eschew this set piece. While I absolutely affirm the entanglement of money practices with a variety of institutional systems and patterns – with norms, laws, and traditions – I resist the temptation to redescribe money as an institution. Rather, I fix the money relation quite narrowly and specifically: *money is a relation between creditor and debtor*. Though the money relation be specific, it is not simple. To grasp the money relation comprehensively we must expand it across four dimensions. The money relation always involves:

1) A money token – a claim/ticket/contract that *represents* the relation and *links* creditor and debtor
2) A creditor – who holds, possesses, or has title to the token
3) A debtor – the party on whom the token makes a claim
4) A denomination – the quantity of credit/debt[5] in a specific money of account

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I call this the money array. Expanding the specific money relation into its four dimensions helps to crystallize the key point that money is not value itself. No form of the money stuff – as money, i.e., as part of the money relation – ever possesses any positive, intrinsic value.

To bring the weight of this point to bear – to help capture the money array – I offer a metaphor (not a model) drawn from computer science. In a variety of computer programming languages one can have both 'normal variables' (the standard kind) and 'pointer variables' (a special kind). A normal variable is just a location in computer memory that *stores a value.* Normal variables *have value*. In stark contrast, a pointer variable directly contains no value whatsoever. Instead, it literally *points to* another variable – that is, to a normal variable that contains value. But the pointer variable has no value; all it holds is an *address*, the physical memory address of the normal variable. Money is a pointer variable.

The raison d'être of the money stuff – of any coin, note, bill, check, or digital token – is not to contain, have, or incarnate value. Money has no value. The value element of the money relation never lies *in* the money stuff, but rather can only be located *across* the entire money array. 'Array' denotes an ordered series, an arrangement of quantities or symbols, or, in mathematics, a matrix. In referring to the 'money array', I indicate not an array *of* money; rather, I designate money itself *as* the array. Money cannot be grasped as a thing, a concept, or as any sort of simple relation; it can only be understood in the richer sense of an *array*. The value dimension of money depends on the entire money apparatus: creditor, debtor, token, and denomination. If we isolate the money stuff, the token or claim itself, we do not find value in it, though we will observe that it wields a certain purchasing power in that agents may be willing to give valuable commodities in exchange for the claim of credit/debt. Fixing our gaze on the name of money (denomination, money of account) helps us to see that the money thing is not moneyness, yet money of account does not exist independently of the array. And while we are right to insist on money as a relation, we must understand that relation in its specificity.

Money-gold and commodity-gold are never the same

Perhaps we are still stalked today by the specters of commodity money because of our failure to reckon with the history of both money and theories of money. In concrete terms: some of today's most popular 'heterodox' theories of money rely on key references that got those histories quite wrong. I speak in particular of the significant impact of Georg Knapp's 1924 book *The State Theory of Money.* Knapp's text arguably serves as the ur-source for Randall Wray, Stephanie Kelton, and other modern money theorists (MMT), while also playing a central role in the work of Ingham and in a wide variety of neochartalist accounts. Here is not the place to engage with Knapp's concrete development of the case for money as a "creature of the law", which numerous contemporary writers use to build their own alternative to commodity theory (Knapp, 1924: 1). Rather, I want merely to point out how dependent Knapp's project is on that same commodity theory: he both accepts and appropriates metallism's own terms as part and parcel of his state theory of money.

Though it goes unremarked by almost all of his followers, Knapp adopts the standard Mengerian line on the truth of commodity theory and the origins of money as the "most saleable commodity". Knapp presumes that the historical record on money can stand as proof that commodities with intrinsic value have *become* money: "a definite material grew into a means of payment" (Knapp, 1924: 25; see Menger, 2009 [1892]: 36). In other words, Knapp does not contest Menger; he only augments him. First, Knapp assumes that money was once a commodity; then, he poses the question of how a *transformation* could take place, whereby the modern state issues money as legal tokens that *substitute* for prior commodity money.

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Writing in the early twentieth century, Knapp contends: weighed amounts of precious metals have historically been money; they still can be money today; and there is no reason to depart from the gold standard (Knapp, 1924: 5, 1). Knapp advances the modest argument that today *chartal* payment is also possible – payment in tokens *declared* to be of value by the state. In this way, Knapp's work depicts the historical shift from *gold money* to *paper money.* The foundation for chartalism – indeed for the very concept of fiat money – is that state declaration (backed by state power) can *replace* the intrinsic value of the commodity.[6] Ultimately, Knapp effects a rapprochement with, not a radical break from, commodity theory.

However, the construction of a heterodox tradition in money theory, one that serves as the chief (if not only) alternative to 'orthodoxy' has obscured many of the actual facts about Knapp's theory. Worse still, the construction of this tradition has covered over an entirely distinct and important strand of credit or claim theory. That alternative lineage starts with the work of R.G. Hawtrey and Henry Macleod in the late nineteenth century, reaches something of an apex in the writings of Alfred Mitchell-Innes in the second decade of the twentieth century, and was both preserved and promoted by the prolific, unfinished, mess of a masterpiece that is Joseph Schumpeter's *History of Economic Analysis* (Hawtrey, 1919; Macleod, 1889; Innes, 1913; Innes, 1914; Schumpeter, 2006).

There are many insights to be gleaned and lessons to be derived from this rich terrain of thought. In this section I will develop just one central argument, designed to achieve two ends: first, to resist the inertial force of MMT, neochartalism, and state theory as today's dominant alternatives to a much-maligned commodity theory; and second, to prove that commodity theory is not just out of date or no longer relevant today – the age of so-called fiat money. Much more significantly, the commodity theory was always wrong, both theoretically and historically. Gold *was never* money and gold *can never be* money.

Even in those historical periods when coins seemed to preponderate, *money* was never a weighted quantity of *metal* (with intrinsic commodity value). Rather, in these contexts the coin was a *token* or *symbol* of a credit/debt relation. The money token is always a *claim ticket*. And it necessarily makes a claim on a specifiable debtor. The token itself need not have any value at all: it could be a piece of paper, lines on a clay tablet, marks on a paper ledger, or digits on a computer spreadsheet.

There have been many societies, of course, wherein the object used as token of money – e.g., coins made of copper, silver, or gold – was itself a good that had both some intrinsic use-value and a market exchange-value. Dentists have long used gold to fill cavities. While copper coins date to at least the third century BCE, copper plumbing goes back another 2,000 years. Finally, by far the most important productive use of precious metals is as raw material for making jewelry. In any of these contexts (dentistry, plumbing, or jewelry), agents wishing to buy gold or silver as inputs to their production process must accept the going market price. And if a society wishes to use one (or two) of those metals as the basis of its money tokens – by minting coins – then those market prices will prove distinctly relevant to the monetary order.

Specifically, such societies will need to make certain that the commodity value (as a metal) of their money token always remains less than its money 'value' (as a claim of denominated credit/debt). The mint price will need to be higher than the previously extant market price. Within a properly functioning coinage system, money-gold always has a higher denomination (and thus seems to be 'worth' *more*) than the market price of commodity-gold. For just this reason, the monetary system breaks down the moment that relation inverts, for if commodity-gold is worth more than money-gold, no one will continue to use gold coins as money. They will hoard them for their commodity exchange-value; they will melt them down and sell the bullion overseas. This means that money can never be 'sound', because to be

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'sound' is no longer to be money.[7] Hence we can refer to these coinage systems as having or using 'commodity money' only in the very limited sense that their money tokens were composed of a commodity. *But the nature of their money was not that of a commodity.* Money is not and has never been a commodity in that sense – and money's nature would not change if those societies substituted paper money or any other symbolic representation for the coin tokens.

One could easily amplify and substantiate this argument by drawing on the neglected credit theorists I named above (see Chambers, 2023). But one need not go so deep into the historical archive to find an incisive critique of commodity theory that tracks this account. In his articulation of claim theory (which he actively dissociates from state theory), Schumpeter builds a definitive case against commodity theory (Schumpeter, 1956: 153-162; Schumpeter, 2006: 276, note 5). Metallism's fundamental error is the failure to distinguish commodity-gold from money-gold. Money-gold and commodity-gold are my terms, but I draw them from my reading of Schumpeter who criticizes metallism because it cannot explain why paper money and old metallic money both circulate at par (Schumpeter, 1956: 158). Metallism ignores the fact that turning commodity-gold into money-gold increases the value of the former. Schumpeter readily admits that money-gold will always have a higher denomination than its metallic content in the form of commodity-gold, but he adamantly insists that this proves nothing about the intrinsic value of gold: "The assertion that metal as money [money-gold] depends on the value of the metal as a commodity [commodity-gold] is correct only in the sense in which it is also correct to say that the value of the metal as a commodity [commodity-gold] depends on the value of the metal as money [money-gold]" (Schumpeter, 1956: 158).

Commodity-gold and money-gold prove to be fundamentally different entities; the nature of one never determines the nature of the other. The fact that commodities (even if only in the form of paper) always serve as the raw material for money tokens does not indicate anything about money's essence. Indeed, Schumpeter shows that money-gold and commodity-gold are incompatible.[8] Unlike some contemporary heterodox money theorists, Schumpeter's critique of commodity theory proves total and unsparing:

> *Money is not a commodity* – not even when it happens to consist of a valuable material. For as soon as the latter is used as money, it must necessarily cease to fulfil its role as an economic good [commodity]; and as soon as a piece of money made of valuable material is diverted to use as a good, e.g., for jewelry, *it ceases to be money*. As long as a material is money, it satisfies no wants and can never be the object of subjective use-value appraisal, and therefore *as money can never have value of its own*. (Schumpeter, 1956: 161, emphasis added)

It would be ignorant or naive to deny that commodities have been used as the basis for money tokens: gold *bullion* is stamped at the mint and turned into gold *coins*. But I read Schumpeter so as to reveal the truly radical alchemy of the mint. This is not the alchemy endlessly dreamed of by scientists and philosophers, in which a base metal is transformed into a noble metal. The mint *starts* with the noble metal and then *makes it disappear* by turning it into money.[9]

Functionalism always fails

The importance of distinguishing commodity-gold from money-gold goes well beyond correcting the historical record. Only on the basis of this account – only, as I argue, on the grounds of a radical credit/debt theory, a theory that accounts for the entire money array –

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can we finally develop a theory of money that exceeds the clutches of functionalism. Functionalist logic has plagued theories of money from the start. Jevons and Menger rely on that logic deeply and explicitly, but Francis Walker distills it to a pithy phrase that became famous: "money is that money does" (Walker, 1879: 1). Walker's line authorizes a theory of money that answers the question 'what is money?' by listing money's functions. This approach still structures introductory textbooks (e.g., Mankiw, 2010: 80) and appears as common sense in much of the economic literature.

Significantly, functionalist logic underwrites not only commodity theories of money, but also theories meant explicitly to reject commodity theory. We can turn to a recent example to illustrate the point: Tony Lawson's review of Randall Wray's new book (Lawson, 2022; Wray, 2022). Both Wray and Lawson understand themselves as advancing quite radical (though incompatible) theories of money – utterly opposed to commodity theory – yet both are happy to adopt a functionalist account. The point is driven home with real force in Section 3 of Lawson's article, titled "The function(s) of money". It opens with a long quote from Wray, which affirms the practice of "defining money by its functions", and then goes on to give the standard textbook account (Lawson, 2022: 5; cf. Wray, 1998: 27-29). Lawson rejects Wray's answer, but not his method. For Lawson, money has but one "actual or true function" – "serving as a communitywide accepted means of payment" (Lawson, 2022: 5). The Lawson/Wray debate thus hinges on how many functions money has, and on specific interpretations of the nature of money based on these "system functions" that it performs (Lawson, 2022: 4). Money is as money does.

What's wrong with a functionalist account? Walker's contemporary, Alexander Del Mar, gave one of the best answers to this question in a withering 1896 critique. For Del Mar, the functionalist method is in contradiction with itself: a thinker calls on functionalism in order to *define* something, but this is just what functionalism cannot do. To argue that X performs certain functions does not, in itself, tell us the nature of X. Both a hammer and a heavy shoe can be used for pounding nails, but a shoe is not a hammer (my examples, not Del Mar's). Functionalism fails to distinguish money from not-money, because some things that are not money might well be used to carry out what functionalism would want to call "money functions" (Del Mar, 1896: 26).

Any tenable theory of money must first respond to functionalism by asking why these are *money* functions, as opposed to some other kind. Such a theory must then distinguish money, which by definition performs these functions, from things that are not money, but which may also perform them. As above, to distinguish the hammer from the shoe one must develop an account of hammers that exceeds a description of 'performing the nail-pounding function' – because both hammers and shoes do that. Saying that shoes can pound nails obviously says little about shoes, but saying that hammers 'hammer things' is just as empty. Del Mar criticized functionalism for its consistent incapacity to *specify* money; I read him as showing that we can only get at the being or nature of money if we can distinguish money from non-money, including cases where non-money carries out money functions – such cases occur all the time.[10] The delineation of supposed functions therefore tells us very little about money as money (see Cencini, 1988: 30).

Importantly, to insist that a viable theory of money must distinguish money from not-money does not mean to define money abstractly, or ahistorically. I differentiate my account of the money array from an analytic approach that would develop an ideal-type or 'model' of money. The money array – token/creditor/debtor/denomination – is not something merely posited by some sort of ethereal 'theory' (nor derived from a prior concept). Put differently, the money array must not be confused for a subjective postulation one would subsequently 'apply'

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to the world. On the contrary, the money array is an entity *of* the world. My approach insists on locating both money practices and theories of money within history. From that beginning it is possible to develop a richer conception of money that can analyze – can make sense of – those very practices. Finally, this methodology builds out a theory of money capable of distinguishing money from other things, even if those things sometimes perform the same functions as money. Therefore, while money's definition must not be abstract or transhistorical (because it *comes from* the world), it must still, in a certain sense, be *pre hoc*; a theory of money must make sense of, and allow us to draw powerful distinctions in, the world.[11] In the concluding section I develop a number of these distinctions, as a way of indicating the analytic power of a fully non-functionalist account of money.

There is no money without a debtor

To elaborate my theory of the money array, contrast it with functionalism, and demonstrate its distinctiveness, I close with an exercise both straightforward yet often conspicuously missing from most theories of money.[12] The task: to consider a series of examples, delineating why some are money and some are not. Each case begins with a particular entity that is putatively 'money' – this could be an explicit 'claim ticket', an example of purported 'commodity money', or a new type of money that takes the form of a 'financial asset' – to which we then apply the same process: to account for the ostensible money by redescribing it in terms of the money array. This requires, as briefly detailed above, first specifying both the creditor (the holder of the claim of credit) and the debtor (the party on whom the token makes a claim), and then determining the money of account (the denomination of the token). If the example can be elaborated in terms of all dimensions of the money array, then we call it money (or money-credit).[13] If a case cannot be specified in terms of the full money array, then it fails to be money.

Here are the examples I wish to consider:

1) 1 UK £5 note (series G)
2) 1 Deutsche Bank deposit account of €1.000 euros
3) 1 Morgan silver US dollar coin (1882)
4) 1 barrel of WTI Crude Oil
5) 1 futures contract for March 2023: WTI Crude Oil, $77 strike price
6) 1 30-year US Treasury Bond: maturity date, February 2043; coupon, 3.125; par value, $100
7) 1 bitcoin
8) 1 tether
9) 1 WhatsApp message sent from me to the reader, which reads: 'I owe you €5. —Sam'

Table 1 specifies each case through the terms of the money array and the discussion below elaborates. My first example proves quite popular: the British 'fiver' is a paper/plastic money token of credit/debt (see Lanchester, 2016). On its obverse it nicely specifies the debtor and denomination, with the printed sentence: "Bank of England – I promise to pay the bearer on demand the sum of five pounds". The fiver is money. The creditor is the 'bearer', i.e., whomever holds the note. The debtor is the Bank of England. The denomination is 'five pounds' ('pounds' being the main unit of sterling – hence 'pound sterling', 'GBP', or simply 'pounds'). What is a £5 note 'worth'? On the one hand, to the extent that price measures value, money has no price (because it has no value). On the other hand, money is itself the measure of value, and thus under the category of 'market money-value' I have simply listed the denomination of the debt, i.e., £5 – exactly what the debtor promises to pay.[14]

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The second example also seems simple, but I want to underscore its importance: most money in the world today is bank money. That statement holds in terms of both the typical *form* that money takes and with respect to overall *quantity*. In a somewhat reductive but still illustrative sense, we can say that *money is bank money*. Our example consists of a basic bank deposit, with the current account total of one thousand euros. The old (and false) model of banks as intermediaries – who hold our money for us – renders counterintuitive one of the first principles of banking. Our deposits are not assets that the bank safeguards: *deposits are the bank's liabilities*. (Its assets are loans). Deutsche Bank is the debtor in this example; they *owe* the depositor (who is the creditor) €1.000,00. Your deposits are a loan to the bank, and they are money precisely because the bank is your debtor. Notice here that the UK £5 note is also bank money, with the Bank of England as our debtor.

Table 1. Is it money? *Source*: Author's own.

Money stuff	Denomination	Creditor	Debtor	Current market money-value*
£5 note	pounds	note holder	Bank of England	£5
bank deposit	euros	depositor	Deutsche Bank	€1.000
$1 coin *as money-silver*	US dollars	coin holder	US Treasury	$1
$1 coin *as commodity-silver*	none/any	coin owner	none	$20–$50,000
barrel of WTI crude	none/any	oil owner	none	$78
futures contract (WTI crude)	US dollars	contracting party	exchange as counterparty	$1,000
US Treasury bond	US dollars	bond holder	US Treasury	$87
bitcoin	bitcoin?	bitcoin owner	none	$21,650
tether	(tether) dollars	tether holder/owner	Tether institution	$1
text message	euros	reader	me	€0–5

*Approximate market prices as of 15 February 2023

Our first two examples (the fiver and the euro deposit account) thus prove quite similar in formal terms of the money array. We observe two key differences: first, that between printed banknotes and digital deposits; and second, that between a claim on the central bank and a claim on a commercial bank. These differences translate into a tradeoff for individual holders of money: the commercial bank's *form* of money proves superior (because digital dollars are more convenient than paper dollars), but the central bank is a better *debtor* (because commercial banks fail at a much higher rate).

My third listed object, the late nineteenth-century US silver dollar, actually gets two rows

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on the table – a move that follows the logic of my second thesis. Conceived in relation to money, the silver dollar can be one of two entities (never both). As money-silver, the coin is just like our £5 note: a money token denominated in US dollars, held by a creditor against the US treasury as debtor. Again, as a token of debt the coin has no value; it is only 'worth' its denomination – $1.

But as commodity-silver the silver dollar becomes a different beast entirely: depending on both its quality (measured by its grade) and its provenance (indicated by its mint mark), its current market value will range from as little as $20 to as much as $50,000. The dollar coin as commodity-silver is not money. First, and more obviously, we can see that there is no debtor. As a collector's item, based on its rarity and quality as linked to the value of the commodity-silver, the silver dollar is not itself a *claim* on a debtor. To hold the coin is not to possess a claim against anyone at all – no one *owes* me. Indeed, the worth of the coin can only be realized if I sell it to a second party for real money. When I pay for goods and services with any of the first few examples, I receive something of value (a commodity with a specific use-value), but I give something *without* value – I merely hand over a claim on a debtor. In contrast, when I sell the silver dollar I *realize* its commodity value by exchanging it for money. One of the paradoxes of capitalism is that we can only realize value by exchanging something that has value (a commodity) for something that has none (money). We can thus contrast the commodity-silver as a kind of thing in itself (it points nowhere) with the fiver or bank deposit: there the token itself already points to a second party (the debtor).

Second, and more subtly, the commodity-silver is not denominated in a money of account. I could realize its value by selling it for various quantities of dollars, euros, rupees, and so on, but as commodity-silver it has no inherent denomination – no intrinsic connection to any of those moneys of account, and no specified quantity. A commodity lacks denomination because it is not a token of debt. Nothing stops us, of course, from positing possible market prices (in various moneys of account) for our commodities. But we must not conflate what we think they may be worth on the market with the idea that they are themselves money. Commodities are priced (in money); monies are denominated. [15]

The barrel of oil is strikingly similar to the commodity-silver, with the main difference being that no one would ever confuse it for money. Like the silver, the oil is a commodity with a market price that can be realized in money terms. But it has no denomination and no debtor. A barrel of oil is not money. This seems almost too obvious to write out, but I state the point directly as a way of clarifying the analytic efficacy of my concept of the money array. Many readers may start with basic intuitions telling them that oil is not money, but silver dollars are. We can now see that both commodity-silver and oil cannot be rendered legible within the money array, while money-silver, £5 notes, and euro bank deposits can. The money array succeeds exactly where functionalism fails: in distinguishing money from not-money. It provides clear grounds for rejecting some claims to money status.

Moreover, the money array shines a light on examples of money we may not have previously considered. Obviously, oil is not money. Less obviously, I will now argue, a *derivative* on oil *is* money. At its core, a derivative is a *contract* between two parties; as we will see, it therefore mirrors the relationship between bank and client – a reflection through which we can glimpse its money nature. In the example given in Table 1, I have purchased – from a broker, dealer, exchange, or other market maker[16] – a cash-settled WTI Crude oil futures contract dated March 2023; the strike price is $77, and the quantity is '1 contract', which translates into 1,000 barrels of oil (the minimum contract amount). Because the current price of oil is $78, my contract is 'in the money' with my dealer, meaning the price of oil has moved in my favor relative to the contract price. And because this is a cash-settled contract, I do not have to

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take delivery of the oil for the $77 strike price and then resell it for $78; rather, at the settlement date the dealer will owe me the $1 difference in price (for a total value of $1,000).

A derivative is a money-credit due to its contractual nature, which obligates one party – *indebts* them – to the other.[17] We can picture the derivative as a token of debt owed me by the dealer, very much like the deposit account held by the customer of Deutsche Bank. Of course, the derivative is also very much unlike the bank deposit, because the contract can move either way: in the given example, I am in the money, but if the price of oil had dropped I would be out of the money. I would owe the dealer. To complete the analogy: it's as if I commit to a relationship with a bank today, yet do not know until some point in the future whether I am *depositing* money with them (they owe me; I'm in the money) or *borrowing* money from them (I owe them; I'm out of the money).

Further, unlike my deposit account, I can sell the derivative contract to another party. However, as elaborated below, the derivative shares this dimension with other forms of money-credit; moreover, the ability to sell the contract for money is not what makes the derivative money. Commodities can of course be sold for money, but when I sell the futures contract to a third party, I transfer not just an object (say oil); *I transfer my claim* on the dealer as counter-party. The money-value realized in the sale remains bound up with the dealer (counterparty) *as my debtor*. If I sell a barrel of oil, the buyer cares only about the quantity and quality of the oil. When I sell the futures contract, the buyer cares very much about the reliability of the counterparty (the dealer as debtor). Further, the money-value of the derivative is not based directly and solely on what someone will pay for it on the open market (as is the case with a barrel of oil), but rather remains connected to the debt obligation of the dealer. The dealer does not have to buy the contract from me, but they are obligated to cash me out at the end of the contract (again, much as the bank must do if I want to transfer my deposits somewhere else).

In this aspect – having a tradable market value directly linked to its claim on a debtor – the derivative as money-credit bears a strong resemblance to the next item on the list, a US Treasury bond. Arguably, a bond is the quintessential example of money: a token of credit/debt denominated in money of account. Some readers might find this claim surprising, but it is not at all a novel argument: Henry Macleod not only defended that theoretical position in 1889 but also backed it up empirically by citing British case law establishing that not just bonds, but indeed foreign bonds could serve as 'currency', which for Macleod was the most significant name for money (Macleod, 1889: 95, 97-101; citing Gorgier v. Mieville [3 B. & C.]; cf. Schumpeter, 2006: 1043). Holding a Treasury bond is a lot like holding a $20 bill: the holder is the creditor, the debtor is, essentially, the US government,[18] and the denomination is dollars. Of course, the bond proves more complicated because it bears interest (through its coupon rate) and, relatedly, because it is also a tradable market security. In our example we have a 30-year bond, with a 3.125 coupon and a February 2043 maturity. Its owner can therefore hold the bond and receive an interest payment (coupon) of $1.56 every February and August, until February 2043 when she will receive the $100 face value from the government.[19] Or, she can sell the bond in the open market now for approximately $87.[20] Significantly, none of these complications alter the basic structure of the bond as money-credit, which the device of the money array crisply illuminates.

This brings us to bitcoin. Like the derivative and the bond, the bitcoin exists on financial markets today as a tradable asset (Levine, 2022; Mariz, 2023). To simplify, we can identify three main aims of participants in money markets:[21] generating returns, hedging risk, and maintaining liquidity. Analyzed in these terms, bitcoin seems capable of the first, but incapable of the last two. One can certainly *speculate* in bitcoin, but both the randomness and volatility

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of its price movements make it ill-suited to any other money market use. Of course, I have already rejected a functionalist account, so bitcoin's inadequacies in terms of money market functions do not themselves determine bitcoin's being or not-being as money, any more than its inadequacies in terms of the traditional money functions would do. The UK £5 note is a poor hedge; the US Treasury bond is a lousy means of payment or exchange. Nevertheless, the T Bond and the fiver are money.

The best case for bitcoin as money perhaps would lie in the once-held promise of bitcoin as a wholly new money of account. This is why I have written 'bitcoin?' in the denomination column: early advocates of bitcoin conceived of it as a radically new form of money in the Keynesian sense in which money of account proves fundamental. To realize such promise would mean to make bitcoin a new form of denomination, a measure of value of all other economic goods and financial assets in a society. Yet this vision was always bound to fail, because the proof-of-work blockchain was not designed to create money as a token of denominated debt.

Quite the contrary, the blockchain as decentralized ledger is not a bank balance sheet; it's a property register. The blockchain determines *ownership* of 'digital coins' that themselves make no claim on any debtor whatsoever. Bitcoin is not now and can never be money because it has been purposively designed to be not-money. Bitcoin is a virtual asset – digital gold that could only hope to be a kind of faux commodity-gold, never money-gold. Neither bitcoin nor commodity-gold are money, and they are 'not money' in the same way: both are assets that one can own, but neither makes a claim on a debtor. I am not saying bitcoin is 'faux money'; bitcoin is not money at all. Rather, bitcoin is a 'faux commodity', virtual gold (Chambers, 2023).

Hence the value of bitcoin is its market price as expressed in some other money of account (i.e., at the time of writing, just over $21,000). On this axis the bitcoin shares much in common with the barrel of oil: its denomination is none. Analyzed through the money array there can be no case for bitcoin as money. At the same time, this approach lets us see the similarities between bitcoin and financial assets. Both euro bonds and bitcoin are easy targets for speculative investment: money market traders looking for return are just as happy to buy either. Importantly, this does not make bitcoin money, but it helps us see why crypto has had such a significant impact on contemporary finance (Levine, 2022).

Nevertheless, crypto's biggest 'achievement' has not been the new money it promised, but the reinvention of one of the oldest forms of money: bank money. While masquerading as cutting edge, paradigm-changing, disruptive technology, the tether is just a nineteenth-century banknote in new clothing. Tether is a shadow bank, and the tether token is shadow bank money.[22] The token is indeed a token of credit/debt, held on the Tether institution. The denomination appears to be 1 tether; they even made up their own currency symbol to drive home this point. However, the actual denomination is 1 US dollar for a very simple reason: *that's what Tether owes me* – not 1 tether, *1 dollar*. Put differently, 1 tether token, marked with the tether symbol, represents not 1 tether of credit/debt, but one *dollar* of credit/debt. In reality, the tether symbol functions not to *denominate* the debt but to *specify the issuer* of that debt (again, the same way various banknotes have done historically). Hence the tether proves quite legible as money: it easily fills out the terms of the money array.

Nonetheless, it fails utterly to be a *new* form of money because it fails to be crypto – at least if that term serves to designate the *decentralized* ledger that is the core of blockchain technology. The fact that I can transfer my claim on the Tether institution to another party by using the blockchain does not make my tether 'decentralized' any more than it would for the UK fiver, which I can hand over to another party in person. Both transfers occur 'outside the

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banking system' and are in some sense 'decentralized', but both are money because they are claims on specifiable debtors (a central bank and a shadow commercial bank). The thoroughly centralized Tether institution issues and redeems tether tokens, and the quality of tether as money depends on the solvency and liquidity of that institution – just like any other (shadow) bank.

Last but not least, I offer a silly, yet still quite serious, example, one which demonstrates that the terms of the money array prove both flexible and scalable. The money 'thing' here is nothing more than a WhatsApp message I send to the reader, 'I owe you €5. —Sam'. The message itself is the token, verified by WhatsApp as first delivered (two grey checkmarks) and then read (checks turn blue) at a specific time and date. To receive the message is to become the creditor; in sending and signing the message, I become the debtor. The message also concisely indicates the denomination (5 euros) of the credit/debt. In sum, the money array renders my WhatsApp message fully legible as money.

This example merely concretizes the most famous line from Minsky: "Everyone can create money; the problem is to get it accepted" (Minsky, 2008: 255). Modern money is *bank money* because banks – including *shadow banks* – consistently excel not at creating money (by issuing debt, in the form of deposit accounts): anyone can do that, as Minsky states plainly and as I show simply with my WhatsApp message example. Modern money is bank money because individuals happily loan banks money (in the form of deposits) on the safe assumption that other individuals will *accept* claims on the bank in exchange for goods, services, or other money-credits. In one sense, only banks can get their debt-issuance accepted, but in saying that we have to stress the huge number of financial institutions (and financial instruments) that operate very much like banks, even if they are not registered as banks. Hence my emphasis on shadow banks just above: my in-the-money derivative contract is a money-credit, one that looks a lot like bank money, even if my counterparty is not a legally chartered bank.

When I describe my WhatsApp message as money, I absolutely do not call it *good* money. I have highlighted this point by designating the market money-value as ranging from the full €5, which would be par, all the way to €0. That is, if you, the recipient of my message, try to sell it to someone else (or transfer it in exchange for commodities), you will probably not receive 'face value'. Indeed, you seem quite likely to have your sale or payment in Sam-credit refused entirely. Nonetheless, these important facts do not militate against the *nature* of my text message as money. Rather, they indicate only that it is an extremely low form of money on the money hierarchy – a poor form of money. We must not forget that monies trade at less than par, all the time (e.g., junk bonds). Indeed, money entirely ceases to circulate as money, all the time – as the history, including very recent history, of failed banks decisively attests.

We can synthesize the broader point as follows: it is in the nature of money as a claim of credit on a debtor that the debtor can become insolvent or illiquid and thus the money can either 'lose value' (trade at a discount) or simply stop circulating. Returning to earlier examples helps to drive this point home. If instead of the £5 note we found ourselves in Argentina in 2018, with a 5-peso coin, we could easily draw out its similarities to my text message: in both cases, the holder of the credit may have a hard time *using* it – either to buy commodities or to sell it on the money markets. In either case the 5-peso coin would still be money, but not very good money. If instead of the US Treasury bond we chose a corporate bond on the near-bankrupt company, Bed Bath & Beyond, we would again see similarities with both my text message and the 5-peso coin.

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Money has no value

To say that money has no value is not only to reject any and all variants of commodity theory, but also to resist any tendencies to reify the money token or allow it to ossify as an object of purported value. As I have shown, money is never a *thing* and never a *simple* relation. Money can only be grasped (both conceptually and practically) as the money array, which always includes creditor, debtor, and denominated token of credit/debt. Money is the array, but I have repeatedly emphasized the debtor because we forget this element at our peril: 'my money' is never anything other than *my claim* on a debtor.

In a powerful and important correction to the simplistic notion that class struggle today could effectively be reduced to rich creditors set against poor debtors, Stefano Sgambati has rightly shown that the rich borrow extensively – using leverage to expand their balance sheets – and are thus themselves debtors. Surely Sgambati has no truck with the commodity theory, yet we see within his otherwise incisive account the appearance of one of those commodity-theory ghosts I mentioned at the outset. Sgambati gets caught up in the momentum of his own argument by assuming that because the rich also borrow – because they are debtors – they are therefore not creditors. He writes: "In the twenty-first century, global elites are not owed money" (Sgambati, 2022: 3). *But of course they are owed money, because that's what money is – someone owing you*. The vast majority of the rich's wealth lies in financial assets, and financial assets all take the form of claims on debtors.[23]

For example, many venture capitalists and startups were owed collectively more than $175 billion by Silicon Valley Bank (SVB) before it failed. SVB's failure, like any bank failure, turns on the lights and chases away the value ghosts by showing starkly that one can never hold on to substantive money value: your money is always just one bank run or bankruptcy away from disappearing. Despite the standard language, clients of SVB who moved $42 billion of deposits the day before the FDIC took over were not really 'withdrawing' their money: they were swapping one debtor for another. And if they happened to move their money to Signature Bank (which failed the next Monday) the swap did them very little good.

The old dream was for money to be 'sound', a commodity with real, intrinsic value. The new dream is for money to 'safe' or 'stable', for example by having the government guarantee all bank deposits, or by allowing all individuals to hold central bank reserve accounts (in the form of a CBDC). But this is to deny the reality that money is bank money; money is essentially and *necessarily precarious*, because no debtor can ever be perfectly stable. Any presumption of safe money will always prove false, even under the scenario in which everyone banks with the government.

Money is an array: a tokenized/denominated relation between creditor and debtor. As a relation of credit/debt, money is therefore created when loans are issued, and destroyed both when loans are paid off and when they go bad. And because no loan is ever risk-free, no money is ever sound, safe, or stable. "The mystery of banking is that it issues [putatively] risk-free liabilities [i.e., deposits] in order to finance risky businesses" (Levine, 2018). The mystery of money is that though it has no value it is essential to the circulation of value in a capitalist society. Any theory of money worthy of the name must *attend to the mystery*, by exploring and unravelling money's paradoxes, while resisting the urge to offer another dream of stable money value.

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Notes

1. I follow Schumpeter in taking 'metallism' and 'commodity theory' as synonymous. Schumpeter forges the link by defining metallism as "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, 2006: 274).
2. My phrasing here flips the typical formulation 'money is a commodity' and does so intentionally. Read properly, the commodity theory argues not merely for the technical fact that a society forms its money token out of the raw material of a commodity. In this case we could say 'money is a commodity' but we would not prove anything about the nature of money. Commodity theory argues that, of the many commodities out there, one of those commodities is, becomes, or gets designated as money. Hence a commodity is (always) money, and for that reason the very nature of money is bound up with commodity-ness. In this line of logic, not every commodity gets to be money, but one of them does, and thus all money in its very nature is a commodity.
3. It is easy to conflate the orthodox theory of money with orthodox economics, i.e., the neoclassical paradigm, but the two are not the same. Figures like Jevons and Menger perform a kind of 'triple play': as 'discoverers' of marginalism they served as 'founders' of neoclassical economics, while simultaneously writing canonical texts defending commodity theory. Nevertheless, the Walrasian model of equilibrium that is the core of orthodox economics actually denies commodity status to money, which, on this account, is a mere *numeraire*. In an important sense, the Walrasian approach has no good answer to the question 'what is money?' and, when forced on the issue, often resorts to the commodity theory only as fallback. Ultimately, however, the fact that orthodox economics often *denies* or *avoids* the commodity theory may indicate something of a vague and inchoate awareness of the fundamental relationality of money. I owe this insight to an anonymous reviewer.
4. When used in the context of money, the concept 'denomination' powerfully, but potentially confusingly, combines two meanings of the word. It includes both the older meaning of *name* or *naming* of the credit/debt (pounds, dollars, etc.) and also the mathematical association with units, which appears in money terms as *quantity* (5, 20, etc.). In other words, denomination refers both to the general money of account as Keynes understood it, and also to the specific number. Different denominations can thus range across both *quantity* (smaller or larger denominations) and *type* or *kind* (rupees or pesos). *Denomination* includes both type and number – e.g., 10 euros or 47 dollars. By including it, below, as the final element of the money array, I both account for and go beyond Keynes's concept of money of account.
5. I repeatedly write 'credit/debt' because the two are inseparable – an old but essential insight (Ingham, 2012: 122; Innes, 1913: 392).

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6. The story of 'fiat' money as a historical tale usually begins in ancient Greece, with the basic idea that coins for those societies were, in fact, weighted pieces of metal with intrinsic value. Neochartalists are confident that ancient Greek coins were commodity money, and on this basis they describe (in various ways) the *shift* to a *new* type of money. Crucially, however, even otherwise very rigorous and sophisticated accounts of money rely on the wrong source for this supposed historical evidence. Richard Seaford reads the history of ancient money *through* the writings of Aristotle, asserting that the earliest forms of "primitive money" have only "intrinsic value" (Seaford, 2004: 2). This sets up his claim that the ancient Greeks were the first to invent something more akin to "modern money" – utterly transforming earlier coins by stamping them (Seaford, 2004: 6, 5). Mark Peacock's (2013) work undermines this poor potted history. Peacock shows that the earliest Lydian coins already had stamps, had no specified silver/gold percentage, and were fiduciary. By the time of Plato and Aristotle, the system of coinage was completely incompatible with metallist theory. The issued denomination of coins proved far higher than the metal value, and such coins were tokens of debt. Aristotle himself offers a fascinating and illuminating set of observations about the relation between money and the polis (see Eich, 2022), but he provides an inadequate explanation (a functionalist one) for the origin of coinage. Both Aristotle and contemporary authors like Seaford (who follow Aristotle) are wrong to assume there was a time when money was weighed coins of intrinsic value. In my survey of the extensive contemporary literature on theories of money, Seaford seems to be the go-to source, with Peacock rarely mentioned (for a key exception, see Ingham, 2020).
7. Notwithstanding this fact, nothing will stop issuers of money (i.e., debtors) from *claiming* that their money is 'sound'. But if the token of debt (as a commodity) were actually worth as much as the denominated value of the debt, then there would be no need to issue debt in the first place. 'Sound money' is illogical from the perspective of the debtor: why would a borrower *hand over* to their creditor more in fungible value than they are borrowing? (Of course many loans, such as houses, are overcollateralized, but the borrower retains the collateral. No one takes out a mortgage to buy a house and then lets the bank live in the house). Here I use 'sound' in the narrow sense of intrinsic value. To say money cannot be *sound* does not mean we cannot have better and worse forms of money. On the contrary, rejecting the sound/unsound dichotomy opens up the hierarchy of different monies.
8. I suggest that this account can make sense of historical cases that thwart the interpretive framework of both neoclassical economics, in general, and commodity theorists of money, in particular – cases in which we find an abundance of commodity-metals (copper, silver, gold) but a dearth of *money.* On this front, Ingham offers an invaluable explication of Weber's writing on the case of China, where (in my words) the problem was not a silver shortage but a want of banks (Ingham, 2015: 176; Chambers, 2023).
9. Of course the noble metal can always *reappear*, and it is to their detriment that students of money forget this fact. As long as it remains money-silver, the coin is nothing but a token of credit/debt, just like a paper banknote. But the banknote can never change form, while the silver dollar always has the potential to revert to commodity-silver form. See note 15 below.
10. Here we witness another nail in the coffin of the orthodox account: none of the textbook 'money functions' are unique to money. In-kind payment makes it possible for any designated commodity to serve as *means of payment/exchange* (one party just accepts the commodity, at an agreed money-value, in lieu of money). As Keynes noted, depending on the time and place, land can be a better *store of value* than money (Hayes, 2018: 1209). Finally, while on the one hand, *money of account* can be understood as definitionally specific to money rather than commodities, on the other, many of our moneys of account have commodity names (e.g., pounds of sterling silver). Indeed, if money has a distinct 'function', it will not be found on the traditional list of four. Perhaps

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we catch a glimpse of it in Perry Mehrling's (2016) powerful image of the expanding and contracting money 'pyramid'.

11. This means I also eschew purely nominalist accounts of money that define or theorize money as whatever any particular community or society *takes* to be money. Viviana Zelizer, for example, calls money "an abstraction that observers make from social interactions"; therefore, "all objects that have recognized, regularized exchange value in one social setting or another" are money (Zelizer, 2000: 384; quoting Zelizer, 1994: 21). Zelizer's nominalism naturally leads her to embrace a very long list of examples of money, starting with international currencies and leading all the way to "investment diamonds". On my account, diamonds can never be money, no matter how many people in society think they are (which is not to say one could not use commodity-diamonds as raw material to produce money tokens, i.e., money-diamonds).
12. My final thesis stands as a direct rejection of Georg Simmel's rich, important, and much-cited sociology of money. Simmel asserts that monetary societies can be marked by their transition from bilateral relations of private trust to multilateral relations of public trust. This leads him to argue that money is not a claim on a particular debtor: "Money is only a claim upon society. Money appears so to speak as a bill of exchange from which the drawee is lacking" (Simmel, 2004: 177). Contra Simmel, I contend that money can never be accepted by 'the community', but only ever by definite parties within the community (individuals, households, firms, agencies, governments). A bill of exchange with no drawee is the same as a check written without a bank, but this amounts to a putative 'credit' without a debtor – a contradiction in terms (see Chambers, 2023: Chapter 4).
13. Across the history of theories of money, almost all writers defend some sort of distinction between *credit* as a mere promise to pay, and *money* as that which fulfills such promises. I argue that we do better to replace the money/credit distinction with a version of Mehrling's money hierarchy – specifically, a hierarchy of money-credit (see Chambers, 2023, Chapter 5).
14. If one really wanted to exchange the fiver for some other form of money, one would actually receive less than £5 worth of equivalent money-credits, because the forex dealer will charge a fee (or, to say the same thing, will buy and sell pounds at different rates).
15. The twofold nature of the silver dollar (money-silver and commodity-silver) also has significant implications for its role as money. Contrary to a dogmatic version of the neochartalist position (which would ignore the material basis for the token), we must account for the potential being of the silver dollar as commodity-silver. The money-silver is a token of debt, but because the token takes the form of commodity-silver, we have, in effect, a *collateralized* loan. Your deposit account is a loan to the bank: if the bank issues you paper banknotes, that loan is unsecured; if they issue you silver coins, then the loan is partially secured by the silver as collateral. This may matter in two very different scenarios. First, if your bank goes bust, your money (in the form of money-silver) disappears, but you will be left with the commodity-silver collateral, which you can sell to recoup some of your loss. Second, if the silver market skyrockets, your loan may become overcollateralized, tempting you to abandon the money-silver token and seize the commodity-silver collateral (i.e., by melting down the coins). To do so will almost certainly be illegal: your debtor has not defaulted on their loan, and thus you have no legal right to steal their collateral. This case reveals the coin as having what Colin Drumm, following Mehrling, calls both an 'inside' option (token of denominated debt) and an 'outside' option (international silver market) (Drumm, 2021; Mehrling, 2012). I would emphasize that the 'outside' choice – seizing the commodity collateral for the money loan – is not really a *money* option, but this is not at all atypical: the 'outside' of money is often some non-money assets, as one can easily see by looking at the asset side of central bank balance sheets – and the fact still proves important for understanding the strange twofold being of the silver coin. Finally, we can consider a related edge case. Coin collectors speculate in a particular segment of the commodity-silver market. If they buy non-legal tender coins, and the

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silver market craters, the value of their coin could drop as low as the market will go. Instead, if they buy legal-tender coins, in the event of a silver-market collapse they will hold the option to treat the coin as money-silver, effectively setting a price floor of $1 on the commodity-silver purchase. That is, when the coin dealer sells a 2023 American Eagle silver dollar for $90, he also delivers a put option (with the US Treasury as counterparty) to sell the coin for $1 at any time.

16. Here I narrow my focus to tradable *futures* contracts purchased from a dealer/exchange/clearinghouse as the counterparty and I exclude forward contracts agreed directly between two parties. Most futures contracts today, post GFC, have been moved off of dealers' books and onto exchanges. Regardless of who it is, the key to the derivative lies in having two parties to the contract: just as there is no money without a debtor, there is no derivative without a counterparty. To simplify the example and help the reader visualize the nature of the relation, in the text I refer to the counterparty as the 'dealer'.
17. I radically circumscribe my discussion of derivatives to focus narrowly on their existence as money-credits. For an excellent introduction to derivatives, particularly in their emphasis on what we might call the 'non-secondary' nature of derivatives, see Bryan and Rafferty (2006).
18. Technically the debtor in the case of the $20 bill is the Federal Reserving banking system, which is a private institution, while the debtor for the bond is the US Treasury. Both entities, however, are backed by the full faith and credit of the US government, which makes them effectively government debt (or state money). For more on the stakes of either consolidating or separating the central bank and government treasury balance sheets, see Lavoie (2013).
19. A bond is just a loan and therefore could be written for any amount, but it is standard to issue bonds in set increments. The US Treasury sells bonds directly through their website in increments of $100, and in my example here I have assumed the minimum – a $100 par value bond. The market price of a bond is typically written as a number between 0 to 100, taken to 4 or 6 decimal places, e.g., 98.765432. That 'price' excludes any specified money of account, but the bond itself has a denominated face value. Hence the price must be understood as price per 100 units of that money of account – e.g., $100 or €100, etc. On the secondary market the current norm dictates a minimum of $1,000 par value, and dealers list bonds in 'quantities', which are really just increments of this $1,000 minimum, so a client who buys a $20,000 face value bond will have their account credited for a quantity of 20. If they buy at a price of 98.0000, then the bond costs them $19,600.
20. The bond therefore clearly has what seems to be two 'prices' because it has both a market *price* ($87) and its face value, or *par* denomination ($100). Though we almost never think of it this way, the same is true of most money-credits, as we can see by returning to our fiver: £5 is par (the denomination), but if I exchange the fiver with a forex dealer, I will get less than par. Historically it proved common for deposited bank drafts to receive less (or even more) than par, depending, of course, on the bank on which they were drawn (for an illustrative example, see Innes, 1914: 154). The difference between money and commodities is thus not that only commodities have prices (because money-credits can also be exchanged for market prices) but that only money has par.
21. I refer to 'money markets' in a much more expansive sense than most participants in the financial industry. For them, 'money markets' trade short-term debt, in contrast with 'capital markets', which 'allocate capital' or trade long-term securities. I follow and expand upon Mehrling (2011: 98), who has demonstrated the mutual imbrication of these two markets. For me, the phrase 'money markets' refers to any domain in which money-credits are swapped for money-credits – from overnight repo to venture capital.
22. The Tether institution (on its website FAQs) explicitly *denies* that tether is bank money. They do not wish to admit they are a shadow bank – an admission that would subject them to regulatory scrutiny. Tether prefers to think of their tokens as crypto *assets owned* by their customers, not

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tokens of *debt held* by their depositors. But wishing will not make it so, and tether is nothing but a claim of debt on the Tether institution.

23. The rich's money, just like everyone else's money, is nothing other than what someone owes them. The poor owe much more than they are owed; they have small balance sheets and negative net worth. The middle class, or the merely rich, are owed slightly more than they owe; they still have relatively small balance sheets but with positive net worth. The super rich owe a lot (as the data Sgambati cites clearly proves), but they are owed even more; they have enormous balance sheets and (usually) positive net worth.

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