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From the gold standard to the price-index standard: a Marxian analysis of contemporary monetary arrangements

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Abstract

The paper investigates the formation and characteristics of the monetary standard that prevails in contemporary capitalism from the perspective of Marx's conceptual framework. It argues that Marx's monetary theory of value not only is compatible with credit money, but also reveals the inner logic that prompts the development of a hierarchy of credit-money instruments as the capitalist mode of production evolves. However, this hierarchy may be structured in different manners, as it may not or may be anchored on a money-commodity (as in the gold standard). The paper shows that, in the current configuration of the capitalist monetary system, there still remains a subtle relationship between commodity money and the hierarchy of credit-money instruments – a relationship which is now structured on the basis of a consumer price index.

Key words: Marx, credit money, monetary standard

JEL: B51, E11, E40

There is an inner logic,
And we're taught to stay far from it
It is simple and elegant,
But it's cruel and antithetic

Bad Religion, *Inner Logic*

Heterodox economists have often criticized orthodox theories of banking and finance for overlooking the active role banks play in determining the supply of money. As noted by critics of the mainstream (Moore 1988; Lavoie 2015; Wray 1990) and even by central bankers themselves (Jakab and Kumhof 2015; McLeay, Radia, and Thomas 2014), banks create deposits *ex nihilo* by making loans. Since deposits constitute the largest share of instruments mediating purchases and payments among non-bank private agents,[1] one cannot fully account for the process of money creation without taking stock of the deposit-creating activities of banking institutions – which implies that banks should be regarded as a *special* kind of financial institution, being resolutely distinguished from non-bank intermediaries.

One of the reasons orthodox theories of banking and finance fail to grasp the special role of banks in the process of money *creation* is that they usually see banks exclusively as intermediaries in money *circulation*. The deposit multiplier or fractional-reserve theory of banking (Cecchetti and Schoenholtz 2016, chap. 17), for instance, sees banks as intermediaries in the relationship between the central bank and the public, conceiving of the monetary base issued and the reserve requirement ratios imposed by central banks as the key determinants of the supply of money in the economy.[2] The financial intermediation theory of banking, on the other hand, regards banks as institutions whose role is to intermediate the circulation of loanable funds, i.e. lend out savings (e.g. in the

[1] In the UK, as of December 2013, 'bank deposits made up ... 97% of the amount [of broad money] in circulation' (McLeay, Radia, and Thomas 2014, 15). For the case of the US, see Stella, Singh, and Bhargava (2021).

[2] This view has been all but refuted by the events that followed the GFC (e.g., the failure of QE to promote the growth of broad money), which have shown that the assumption that money velocity is stable cannot be justified.

form of gold) from agents that are willing to postpone consumption to those who intend to invest or consume in the present.

The financial intermediation theory has been embraced by most orthodox economists of the present and the past (for critical reviews, see Jakab and Kumhof 2015; Werner 2016). Interestingly, however, it also seems to characterize the monetary ideas of one of the most radical *critics* of conventional economic thinking, i.e. those of Karl Marx. As is well known, Marx regarded that, within capitalist economies, money must ultimately be a commodity. However, as we shall see in this paper, Marx was also aware that claims on ultimate money that are redeemable at par and on demand can and usually do perform monetary functions, and that these forms of '*credit money*' (Marx 2015, 503) tend to displace the money-commodity from the realm of commodity circulation as capitalism evolves. Indeed, as will be demonstrated in this paper, Marx's conceptual framework is particularly well-suited to single out precisely *why* banks are able to issue credit money; and that is so because, contrary to contemporary orthodox thinking, it acknowledges the importance of the *act of payment* and the institutions that organize the *network of payments* in actual capitalist economies. In short, not only was Marx's framework consistent with the fact that transactions in capitalist economies are often mediated by money issued by banks, but it also sets forth the conditions for an actual *explanation* of this development.

However, the fact that Marx's conceptual framework can accommodate bank money does not ensure that his views on money are compatible with *contemporary* monetary arrangements. In Marx's view (2015, chap. 5), the reason why private liabilities can perform monetary functions is that they promise redeemability at par and on demand against monetary instruments issued by the state (or, in Marx's time, a private bank which mediated payments between the state and private agents, i.e. the Bank of England). Yet, for Marx, this arrangement could only work because the state-issued liabilities were themselves ultimately redeemable against the money-commodity.

Marx's view that monetary instruments must ultimately be anchored on a money-commodity arises from his understanding of the very nature of capitalism. In societies where the capitalist mode of production prevails, multidimensional goods and services acquire a peculiar property: that of being one-dimensional (thus commensurable) values

(Marx 1990, chap. 1). For Marx, multi-dimensional goods and services can only be transformed into one-dimensional values by being constantly equated to a third item: a general equivalent, i.e., the specifically capitalist form of money. Yet, Marx is adamant that the general equivalent can only perform the role that is required from it in the process of transformation of ordinary products into values if it is itself a product of labor (Marx 1983, particularly the appendix to chap. 1). It follows that, for Marx, ultimate money, in a functional capitalist economy, must *necessarily* be a product of labor.

Now, it is a well-known fact that, since Nixon closed the gold window in 1971, no monetary instrument issued by the state in an advanced capitalist economy has ever claimed to be redeemable against gold or any other specific commodity. In view of this fact, even sympathetic scholars have come to believe that Marx's conceptual framework is incompatible with contemporary monetary arrangements (Bellofiore and Riva 2015). Others, in turn, came to the conclusion that Marx's contention that the general equivalent *needs* to be a product of labor is inconsistent with his own conceptual framework: in their view, an item can perform the functions required from the general equivalent *even if it contains no labor at all* (Heinrich 2014). This paper does not engage with this debate directly. Instead, it disputes the very premise on which the latter is based: i.e., the notion that the chain of monetary instruments in contemporary capitalist economies is *not* ultimately anchored on products of human labor. More precisely, the paper contends that the instruments in such chain are just as redeemable against products of human labor as they were in the classic gold standard and the Bretton Wood system.

Within both the classic gold standard and the Bretton Woods system, the bank liabilities which mediate payments between non-bank agents offered convertibility at par and on demand against state (or central bank) liabilities, while the latter promised convertibility at par and on demand against a *specific commodity*, i.e., gold. In contemporary monetary arrangements, bank money continues to offer redeemability at par and on demand against central bank money; the latter, in turn, promises convertibility against a *basket of commodities*, i.e., the commodities that form the price index based on which central banks fix their inflation targets. Now as before, the transformation of multidimensional use values into one-dimensional values continues to rely on the social positioning of some product of labor as general equivalent; the difference is that the role of general equivalent

is now occupied by a vector of commodities, rather than a single commodity. In other words, in both arrangements, *the role of general equivalent continues to be performed by products of labor*. Relying on Marx's conceptual framework, the paper scrutinizes the passage from the *gold* to the *price-index standard*, highlighting the similarities and differences between them and the practical implications of the rise of a monetary system in which the role of general equivalent is performed by a basket of commodities, rather than a single one.

The paper is divided in 4 sections, besides this introduction. Section 1 explains why Marx regarded that ultimate money must be a product of human labor by highlighting the crucial role the general equivalent plays in the transformation of multidimensional goods and services into one-dimensional values. The section also discusses the reception of Marx's work, focusing on why his theory of money came to be seen as incompatible with two important monetary developments: i) the widespread use of bank deposits as money, and ii) the decoupling of state money from gold. Section 2 demonstrates that Marx's views on money are not incompatible with the widespread use of credit money. By formally depicting how commercial credit displace the money commodity from the role of means of purchase, it shows that the use of bank liabilities as means of purchase and payment can raise the rate of profit of nonbank enterprises while also generating profits for the banks themselves – which explains why, over time, banks instruments tend to increasingly function as money. The section then expands on this principle, showing how the constitution of an increasingly layered hierarchy of monetary instruments can increase the rate of profit in the system, thus explaining why the relationship between ordinary commodities and the money-commodity tends to become increasingly mediated as capitalism evolves. Section 3 traces how this general trend has manifested itself in the actual history of capitalism, by analyzing the historical development of monetary arrangements in two key capitalist countries: the United Kingdom (UK) and the United States (US). Finally, section 4 depicts the transition from the gold to the price-index standard, wherein central banks promise to uphold the convertibility of their liabilities against a basket of commodities. As recent experience makes clear, contemporary central banks do not necessarily succeed in keeping their promise. But this was also the case in the old gold standard, in which central banks were often forced to suspend convertibility against the money-commodity (i.e. gold). Based on this finding, the section develops the

hypothesis that the commodities which compose the price indexes targeted by central banks collectively perform the role of general equivalent and discusses the similarities and differences between the current price-index standard and the gold standard. The paper concludes with a brief reflection on the insights offered by Marx's monetary theory of value into recent monetary and financial developments.

1 Marx's monetary theory of value

The first thing to notice regarding Marx's approach to money is that, in direct opposition to both the classical and the neoclassical traditions, Marx considered his theory of money to be an integral part of his theory of value. Contrary to classical economists, Marx maintained that value is not a material property of goods and services: '[c]onsidered in itself, in isolation', a product 'is not a value' (Marx 1983b, 22); 'as values', goods and services 'are something absolutely different from their "properties" as "things"' (Marx 2008b, 127). On the other hand, contrary to the neoclassical school (which, it must be reminded, was unknown to Marx himself), Marx did not regard value as a subjective phenomenon; rather, he conceptualized value as an objective *social form*, a social characteristic which things obtain under certain social conditions. A thing's 'existence as value [*Wertsein*] does not arise from nature, but rather from society' (Marx, 1976, 91): 'value', says Marx, is 'only the representation in things … of a relation between people, a social relation, the relation of people to their reciprocal productive activities' (Marx 2008a, 145).

To be sure, not all societies have transformed multidimensional goods and services into one-dimensional values. Rather, only societies where goods and services are generally produced for market exchange carry out this transformation on a consistent basis[3]; and these, in turn, are precisely the 'societies in which the capitalist mode of production

[3] '[V]alue' "implies" in fact "exchanges"': '[o]utside of their relationship to each other [as carried out by exchange]', goods and services 'possess no value-objectivity [Wertgegenständlichkeit]' (Marx 2008b, 127).

prevails' (Marx 1990, 125). The reason only such societies can transform use values into values is that, according to Marx, the substance of value is abstract labor, and it is only through the equalization of different use values in exchange that the reduction of different concrete labors to equal abstract labor can take place. As Marx puts it in the French edition of *Capital*: 'only exchange produces this reduction, by bringing the products of the most diverse kinds of labor into relation with each other on an equal footing' (Marx 1969, 70).[4] Now, as pointed out by Marx, only societies where labor power has itself become a commodity owned by the worker systematically produce goods and services for exchange; it follows that only such societies – i.e., *capitalist* societies – are able to systematically reduce concrete labors to abstract labor, and thus also to transform use values into values.

It should be pointed out, however, that exchange as such cannot carry out the social process from which abstract labor results; rather, the process of real abstraction Marx has in mind can only take place through *monetary* exchange. In order to promote the reduction of concrete labors into abstract general labor, the exchange relation must be able, at one and the same time, to directly equalize the labors contained in the two exchanged commodities and indirectly perform the social and universal equalization of the labors contained in all the members of the world of commodities. This, however, can only be done if one of the commodities involved in the dyadic relation of private exchange acquires social validity as 'the immediate existence of value [*Wertdasein*]', that is, if the '*concrete*, useful labour contained in the use-value' of a particular, privately owned commodity is socially posited as 'its own opposite', i.e. as 'the mere form of realization of *abstract* human labour' (Marx, 1976, 21–22).

This, according to Marx, is precisely what happens to monetary objects when they acquire the role of *general equivalents*. Insofar as a monetary object performs the role of general equivalent, all ordinary commodities relate to it 'as its *qualitatively equal*, as *value-thing*

[4] Note that it is not a particular act of exchange, but rather the exchange system through which the many commodities in an economy circulate that reduces the manifold concrete labours to abstract general labour: 'abstract universal social labour [...] is brought about by the universal alienation of individual labour' (Marx 1989, 296–97).

[Wertding]'. By universally relating to the general equivalent as their qualitatively equal, commodities posit the latter as the 'autonomous [*selbständige*]', immediate 'figure of value [*Wertgestalt*]', i.e., 'as the sole figure of value or unique adequate [mode of] existence [*Dasein*] of exchange value' (Marx 1990, 240, 237, 227, translation modified). In doing so, they relate to money as the 'direct incarnation of all human labour' (Marx 1990, 187) or 'immediate materialization [*Materiatur*] of abstract human labour', thus positing the concrete labor contained in the monetary object 'as the immediate form of realization [*Verwirklichungsform*] of abstract human labour', i.e., the '*mode of objectification* [Vergegenständlichungsweise] *of human labour in general*' (Marx, 1976, 20–21, translation modified). As Marx puts it: the money-commodity's 'natural form' is socially posited as 'the form assumed in common by the values of all commodities', so that 'the physical form' of the money-commodity comes to 'count [gilt] as the visible incarnation, the social chrysalis state, of all human labour'. As a result, 'the private labour which produces' the money-commodity 'acquires … a general social form, the form of equality with all other kinds of labour' (ibidem).

In short, by relating[5] to a monetary object as their general equivalent, commodities equalize the concrete labors contained in them to the labor contained in the monetary object. In doing so, they give the concrete labor contained in the monetary object the character of abstract human labor. This, in turn, *reflexively* reduces the diverse concrete labors contained in each regular commodity to abstract human labor, thus giving the useful things produced by labor the character of *values*.

One can now understand why Marx considered that goods and services can only acquire the character of values by taking part in a system of *monetary* exchange. It is now also clear why he considered that the general equivalent should be embodied in a product of

[5] Note that, although ordinary commodities only come into *direct* contact with the money-commodity in exchange, they do not relate to money exclusively in this sphere. As corporate balance sheets make clear, the social process by means of which concrete labors are reduced to abstract labor starts in the production line, where labor products are already ideally equated to money. In other words, although the process of real abstraction from which abstract labor results can only be completed through exchange, it actually starts within the production sphere – provided that the goods and services in consideration are produced for exchange. See Saad-Filho (2002, chap. 5).

human labor: were this not the case, then the process of real abstraction through which the substance of value (abstract labor) is constituted could not be carried out, which then would preclude the transformation of use values into values. Yet, Marx's reasoning has raised two important criticisms. First, it has been argued that his insistence on the need of a money-commodity leads both Marx and his followers to conceptualize money as 'a 'neutral' component of an economic system in which the 'real' values can be analysed with the arbitrary addition of a numeraire' (Ingham 2018, 838; also Ingham 2006). This, in turn, precludes a proper understanding of the key role of bank-created credit money in the dynamics of actual capitalist economies (Ingham 2004, 61–63).

Marxian scholars have opposed such criticism by pointing out that the fact ultimate money (i.e., the general equivalent) needs to be a product of labor does not imply that credit money is incompatible with capitalism, nor that credit money cannot play an important role in the dynamics of the capitalist mode of production (Brunhoff 1973; Arnon 1984; Lapavitsas 1994; 2000; Ganssmann 2011). Rather, it merely means that, due to the very characteristics of the capitalist mode of production, the network of credit instruments employed as money must, within this particular economic system, be ultimately anchored on a stock of gold – i.e., the commodity that functions as general equivalent (Ganssmann 1998).

This, however, raises yet another problem, i.e., that since the closing of the gold window and the end of the Bretton Woods system the network of credit instruments that perform monetary functions in actually existing capitalist economies *is not ultimately anchored on gold*. This historical development, it has been argued (Bellofiore 1998; Heinrich 2014; 2009), has made Marx's theory incompatible with contemporary monetary arrangements. Yet, as pointed out by Marxian scholars, the monetary theory of value which Marx attempted to develop – his own personal views notwithstanding – is not dependent on money being a commodity (Foley 1982; 1983; Wolfson 1988; Bellofiore 1989; 1998; Bellofiore 2004; Arthur 2005; G. Reuten 2005; Ganssmann 2011; Moseley 2011; Campbell 2002, 2017; Araujo and Palludeto 2022). As argued by Bellofiore (1989, 9), money is 'an institutional representation of abstract labour, i.e. it is essentially a symbol – though sometimes a use value can be its support'. The use value of the general equivalent would only be a historical basis on which the mediation process of abstract

labor developed, therefore, not as a definitive necessity (Heinrich 2009). Based on this view, several works (Williams 2000; Bellofiore 2004; Heinrich 2014; Reuten and Williams 1989) have sought to build a Marxian theory of pure credit money showing that the transformation of use values into values does not require the general equivalent to be a product of labor. In their view, despite Marx's personal views on the need for a money-commodity, his conceptual structure is not ultimately incompatible with contemporary monetary arrangements.

The following sections contribute to these debates in two distinct manners. On the one hand, they not only demonstrate that credit money is intrinsic to capitalism, but also single out the *reasons* why this is so. As shown below, the rise of credit money increases the rate of profit of both individual capitalists and capital as a whole; this explains why, over time, bank-issued and other credit instruments tend to increasingly function as money, *regardless of whether ultimate money is or is not a commodity*. On the other hand, the paper disputes the view that the network of private instruments which function as money in contemporary capitalism is not ultimately anchored on products of labor. To be clear, the paper does *not* dispute the view – advanced by the recent Marxian scholarship – that that the transformation of use values into values can take place even when ultimate money is not a commodity; it does, however, question the notion that the general equivalent in contemporary developed capitalist economies is not a product of labor. As we shall see, whereas in the gold standard and the Bretton Woods system the role of general equivalent was performed by a single commodity, this role is currently performed by a basket of commodities; in both cases, however, *the role of general equivalent is performed by products of labor*.

2 From commodity-money to credit Money

2.1 Commercial credit and the use of promissory notes

As shown in the previous section, Marx believed that, in a functional capitalist society, the role of general equivalent must be performed by a product of human labor (e.g. gold). The fact that the general equivalent must be a product of labor, however, does not entail that only products of labor can perform monetary functions. In *Capital* vol. 1 (1990, 223–25), for instance, Marx points out that 'the circulation of money itself' tends to split 'the nominal content of [monetary objects] away from their real content', dividing 'their metallic existence from their functional existence' and creating 'the possibility of replacing metallic money with tokens made of some other material'. Hence, Marx believed that commodity-money need not mediate exchange 'in its own body'; rather, it can do so 'through a representative' (Marx 1990, 227).

The kind of 'representative' Marx has in mind in the passage above is paper money issued by the state – which, in the UK during the gold standard, were redeemable at par and on the demand by the Bank of England. We shall discuss the role of state money below. Yet, it is important to point out that state money is by no means the only kind of gold-substitutes private agents use to make payments. As noted by Marx (1990, chap. 3), with the development of capitalism, commercial credit becomes increasingly important in mediating commodity exchange: over the development of capitalist exchange relations, commodities are increasingly exchanged neither for the money-commodity nor for state-money, but rather for bills of exchange issued by private agents. Whereas privately issued bills serve as means of purchase, the money-commodity (or its representative, state notes) only 'actually steps into circulation' when 'payment falls due'– i.e., not anymore as a means of exchange, but as 'means of payment' (Marx 1990, 234).[6] As this happens, both the money-commodity and the tokens issued by the state are increasingly displaced as mediators of exchange by IOUs issued by private agents.

[6] 'The money[-commodity] no longer mediates the process. It brings it to an end by emerging independently, as the absolute form of existence of exchange-value, in other words the universal commodity' (Marx 1990, 234).

Let us see how this works.[7] Consider a capitalist economy with two sectors (Figure 1). Sector 1 produces consumption goods and sector 2 produces means of production. The enterprises in both sectors (E1 and E2) start with means of production worth 80 units of gold.[8] They then hire workers (W1 and W2) issuing bills of exchange[9] that are redeemable against 100 units of gold by the end of the period and put together the previously owned means of production and the newly acquired labor power to produce goods worth 200 units of gold. W1 and W2 (who have not yet received any 'actual money'), in turn, issue bills of exchange promising 100 units of gold each and use them to purchase consumption goods from E1. Simultaneously, E1 issues another bill redeemable against 100 units of gold and acquires means of production (which it plans on using in the next period) from E2, and the latter "purchases" from itself the remaining means of production.[10] By the end of the period, both W1, W2, E1 and E2 have claims on others and against themselves redeemable against 100 units of gold – claims whose issuance and acceptance sufficed for the circulation of goods and labor power: 'commodities are not sold for money, but for a written promise to pay at a certain date' (Marx 2015, 501). Indeed, if workers and enterprises find a way to net these claims out by the end of the period, the capitalist economy can manage to carry out the process of expanded reproduction *without using any actual gold*. 'To the extent that they ultimately cancel each other out by the balancing of debts and claims,' the privately issued IOUs 'function absolutely as money, even though there is no final transformation into money proper' (Marx 2015, 501–2).

[7] From here on, this section abstracts from gold-substitutes issued by the state, so as to make the relationship between privately issued IOUs and the money commodity clearer. It also abstracts from the role of capitalists as consumers, as this makes our exposition simpler (without affecting its substance).

[8] For simplicity, we assume there is no fixed capital.

[9] To simplify, we assume that workers are paid in the beginning of the period.

[10] Since the enterprises in each sector have been aggregated, such purchase seems to make no sense. But something akin to that would happen in a more disaggregated setting.

FIGURE 1[11]

Enterprise I		Enterprise II		Workers I		Workers II		
ASSETS	**LIABILITIES**	**ASSETS**	**LIABILITIES**	**ASSETS**	**LIABILITIES**	**ASSETS**	**LIABILITIES**	
Means of production 80	Equity 80	Means of production 80	Equity 80	0	0	0	0	(1)
~~Means of production 80~~	Bills to W_1 100	~~Means of production 80~~	Bills to W_2 100	Bills fom E_1 100	Equity 100	Bills from E_2 100	Equity 100	(2)
Saleable goods 200	Equity 100	Saleable goods 200	Equity 100					
~~Saleable goods 200~~	~~Bills to W_1 100~~			~~Bills fom E_1 100~~	~~Equity 100~~	Bills from E_2 100	Bills to E_1 100	(3)
Bills from W_2 100	Equity 100						~~Equity 100~~	
MP 100	Bills to E_1 100	MP 100	Bills to W_2 100					
Bills from W_2 100	Equity 100	~~Saleable goods 200~~						(4)
		Bills fom E_1 100	Equity 100					
MP 100	~~Bills to E_1 100~~	MP 100	~~Bills to W_2 100~~			~~Bills from E_2 100~~	~~Bills to E_1 100~~	(5)
~~Bills from W_2 100~~	Equity 100	~~Bills from E_1 100~~	Equity 100					

* **Rate of profit (total social capital)** = 40/360 = 11.11%

Two difficulties might prevent this idealized case from taking place. First, market participants may refuse to accept the bills issued by their trading counterparties. Second, there is always the risk that the bills may not cancel out (for instance, E1 may invest less than 100, or workers may consume less than 200), requiring that some of the claims are actually redeemed against gold by the end of the period. Consequently, market participants, and in particular E1 and E2, might find it wise to build up a *reserve fund* (of, say, 10 units of gold each), which represents a cost of circulation and thus reduces their individual rates of profit, as well as the rate of profit of the capitalist economy as a whole (Figure 2).

FIGURE 2

Enterprise I		Enterprise II		Workers I		Workers II		
ASSETS	**LIABILITIES**	**ASSETS**	**LIABILITIES**	**ASSETS**	**LIABILITIES**	**ASSETS**	**LIABILITIES**	
Means of production 80		Means of production 80		0	0	0	0	(1)
Gold 10	Equity 90	Gold 10	Equity 90					
~~Means of production 80~~	Bills to W_1 100	~~Means of production 80~~	Bills to W_2 100	Bills fom E_1 100	Equity 100	Bills from E_2 100	Equity 100	
~~Saleable goods 200~~		Saleable goods 200						(2)
Gold 10	Equity 110	Gold 10	Equity 110					
~~Saleable goods 200~~	~~Bills to W_1 100~~			~~Bills fom E_1 100~~	~~Equity 100~~	Bills from E_2 100	Bills to E_1 100	
Bills from W_2 100							~~Equity 100~~	(3)
Gold 10	Equity 110							
MP 100	Bills to E_1 100	MP 100	Bills to W_2 100					
Bills from W_2 100		~~Saleable goods 200~~						
Gold 10	Equity 110	Bills fom E_1 100						(4)
		Gold 10	Equity 110					
MP 100	~~Bills to E_1 100~~	MP 100	~~Bills to W_2 100~~			~~Bills from E_2 100~~	~~Bills to E_1 100~~	
~~Bills from W_2 100~~		~~Bills fom E_1 100~~	Equity 100					(5)
Gold 10	Equity 110	Gold 10	Equity 110					

* **Rate of profit (total social capital)** = 40/380 = 10,5%

[11] The numerical examples below build upon the examples presented by Reuten (2019, 146)

2.2 From commercial credit to bank money

These difficulties might be partially overcome if there exists a third enterprise (let's call it *bank*) which specializes in evaluating credit, and thus is willing to endorse E1's, E2's, W1's and W2's bills of exchange, which are thereby transformed into cheques redeemable against ultimate money by the bank itself. Since the bank specializes in evaluating credit, its endorsement may increase the other agents' willingness to accept the bills issued by the non-bank agents. Moreover, the fact that all the claims are settled by the bank allows the latter to maintain a gold fund that is considerably smaller than the sum of the funds maintained by E1 and E2 in the case depicted in Figure 3.

To understand why, consider the following example. Suppose E2's assessed probability that E1 will acquire means of production worth 100 is 90%, and that E2 believes there is a 10% probability that E2 will only purchase goods worth 90 gold units. Suppose also that E1's assessed probability that the workers will acquire means of production worth 200 is 90%, and that there is a 10% assessed probability that they will only purchase goods worth 190 units of gold. In such conditions, both enterprises might find it wise to maintain a fund of 10 gold units, which means that, from the perspective of total social capital, there are 20 units of gold allocated to reserve funds. Now suppose all the claims are settled by the bank, and that the latter attaches the same probabilities as E1 and E2 to the possible states of the world. In this case, the assessed probability that 20 gold units will be required to settle accounts is only 1%, and the bank may consider it safe to build reserves somewhat lower than 20 units of gold. In other words, the centralization by the bank of the process of netting out claims from and on each non-bank agent allows for a considerable reduction in the amount of gold reserves in the economy, and thus also for an increase (*ceteris paribus*) of the rate of profit of the enterprises individually and capital as a whole (Figure 3).[12]

[12] Marx considered such developments as intrinsic to the capitalist mode of production: 'With the concentration of payments in one place, special institutions and methods of liquidation develop spontaneously', and the bills issued by the myriad transacting parties 'have only to be brought face to face in order to cancel each other out, to a certain extent, as positive and negative amounts' (Marx 1990, 232),

FIGURE 3

Bank		Enterprise I		Enterprise II		Workers I		Workers II		
ASSETS	LIABILITIES	ASSETS	LIABILITIES	ASSETS	LIABILITIES	ASSETS	LIABILITIES	ASSETS	LIABILITIES	
Gold 12	Equity 12	Means of production 80	Equity 80	Means of production 80	Equity 80	0	0	0	0	(1)
		~~Means of production 80~~	Bills to W_1 100	~~Means of production 80~~	Bills to W_2 100	Bills fom E_1 100	Equity 100	Bills from E_2 100	Equity 100	
		~~Saleable goods 200~~	Equity 100	Saleable goods 200	Equity 100					(2)
		~~Saleable goods 200~~	~~Bills to W_1 100~~			~~Bills fom E_1 100~~	~~Equity 100~~	Bills from E_2 100	Bills to E_1 100	
		Bills from W_2 100							~~Equity 100~~	(3)
		MP 100	Bills to E_1 100	MP 100	Bills to W_2 100					
		Bills from W_2 100	Equity 100	~~Saleable goods 200~~						
				Bills fom E_1 100	Equity 100					(4)
Gold 12	Equity 12	MP 100	~~Bills to E_1 100~~	MP 100	~~Bills to W_2 100~~			~~Bills from E_2 100~~	~~Bills to E_1 100~~	
		~~Bills from W_2 100~~	Equity 100	~~Bills fom E_1 100~~	Equity 100					(5)

* **Rate of profit (total social capital)** = 40/372 = 10,75%

The examples above show that the circulation of claims issued by enterprises and workers and endorsed by the bank allows for a considerable decrease in the stock of money-commodities required by the process of expanded reproduction. The mass of gold necessary for the settlement of mutual claims may decrease even further if, instead of merely endorsing the liabilities issued by enterprises and workers, the bank itself starts to issue the instruments by means of which workers and enterprises trade with one another. Instead of swapping IOUs among themselves, non-bank agents may swap IOUs directly with the bank, and the latter's liabilities (i.e. deposits promising redemption against the money-commodity at par and on demand) are used as the actual means of purchase in the transactions between W1, W2, E1 and E2. Consider the following case (Figure 4):

- E1 and E2 start with means of production worth 80 units of gold;
- E1 and E2 borrow each from the bank deposits redeemable against 100 units gold. Such deposits are created by the bank *ex nihilo*;
- E1 and E2 hire W1 and W2 paying 100 in deposits each, and produce goods that are worth 200 units of gold;
- W1 and W2 purchase all the consumption goods produced by E1, which now owns deposits worth 200 units of gold;
- E1 purchases means of production worth 100, and E2 "purchases" the same amount of means of production from itself;
- E1 and E2 repay their loans to the bank.

rendering the mass of gold necessary for the settlement of payments increasingly smaller. This is exactly what happens with the introduction of the bank into our base case.

FIGURE 4

Bank		Enterprise I		Enterprise II		Workers I		Workers II		
ASSETS	LIABILITIES	ASSETS	LIABILITIES	ASSETS	LIABILITIES	ASSETS	LIABILITIES	ASSETS	LIABILITIES	
Gold 5	Equity 5	Means of production 80	Equity 80	Means of production 80	Equity 80	0	0	0	0	(1)
Loan to E1 100	Deposits W1 100	~~Means of production 80~~	Loan 100	~~Means of production 80~~	Loan 100	Deposits 100	Equity 100	Deposits 100	Equity 100	
Loan to E2 100	Deposits W2 100	Saleable goods 200	Equity 100	Saleable goods 200	Equity 100					(2)
Gold 5	Equity 5									
Loan to E1 100	Deposits E1 200	~~Saleable goods 200~~	Loan 100			~~Deposits 100~~	~~Equity 100~~	~~Deposits 100~~	~~Equity 100~~	
Loan to E2 100		Deposits 200	Equity 100							(3)
Gold 5	Equity 5									
Loan to E1 100	Deposits E1 100	Means of production 100	Loan 100	Means of production 100	Loan 100					
Loan to E2 100	Deposits E2 100	Deposits 100	Equity 100	~~Saleable goods 200~~						(4)
Gold 5	Equity 5			Deposits 100	Equity 110					
~~Loan to E1 100~~	~~Deposits E1 100~~	Means of production 100	~~Loan 100~~	Means of production 100	~~Loan 100~~					
~~Loan to E2 100~~	~~Deposits E2 100~~	~~Deposits 100~~	Equity 100	~~Deposits 100~~	Equity 100					(5)
Gold 5	Equity 5									

* **Rate of profit (total social capital)** = 40/365 = 10,95%

Note that, in Figure 4, the amount of gold reserves necessary for the expanded reproduction of the system falls even further, thus raising the rate of profit of individual enterprises and capital as a whole. Given that the bank's liabilities are more widely accepted as means of purchase than the bills issued by either E1, E2 or the workers, any party who eventually reduces its expenditures and ends up with a surplus of bank deposits may decide *not to redeem the later against gold*, thus displacing (even if temporarily) the money commodity from the roles of means of payment and hoarding.

Hence, the development of, first, commercial credit, and second, credit-money proper, displaces gold from the realm of circulation, giving rise to a hierarchy of monetary instruments. Within the latter, gold still features as the measure of value, and standardized amounts of gold (denominated here as gold *units*)[13] function as price standard,[14] whereas *claims on gold* issued by the bank serve as means of purchase[15] and payment, and can

[13] The gold unit may be equivalent, for instance, to 1/35 of an ounce of gold – which, in the Bretton Woods system, would make the gold unit equivalent to one dollar.

[14] For Marx (1990, chap. 3), gold tends to retain the role of measure of values, whereas the claims on gold issued by the central bank tend to set the price standard. In this paper, however, we abstract from central bank liabilities.

[15] '[Money] functions … first as a measure of value in the determination of the price of the commodity sold; the price fixed by contract measures the obligation of the buyer, i.e. the sum of money he owes at a particular time. Secondly it serves as a nominal means of purchase. Although existing only in the promise of the buyer to pay, it causes the commodity to change hands' (Marx 1990, 233–34).

even function as means of hoarding (if savers choose to retain their unspent income in the form of claims on gold, rather than converting them into gold itself).

The stages of development presented above fit Marx's conceptual framework to a remarkable degree. According to Marx, the 'reciprocal advances' by non-bank agents 'form the real basis of credit', and 'their instrument of circulation, the bill of exchange, forms the basis of credit money proper' – which in Marx's writings takes the form of '*banknotes*' (Marx 2015, 503), and here that of bank *deposits*. This, indeed, is what we saw above, where the development of commercial credit prompted the rise of credit money issued by the bank.

In Marx's view, what prompts bank liabilities to progressively displace not only gold, but also claims on gold issued by non-banks from the realm of circulation is the fact that banks are a form of money-dealing capital (MDC), i.e. 'a particular part of the total capital' which 'separates off' and concentrates the '*technical operation[s]* of monetary payment and receipt' and of 'drawn[ing] up and balanc[ing]' (Marx 2015, 422) the accounts of non-bank agents. Insofar as they take in and pay out money on behalf of capitalists and workers and settle their claims on and from one another, MDCs are in a privileged position not only to evaluate credit, but also to substitute claims on gold for actual gold, and thus also to manage the circulation of money in the economy. Indeed, by the time we get to Figure 4, *all the payments in the economy take place within the bank's balance sheet, which thus becomes the social site where the process of money circulation takes place*.

According to Marx, the reason why non-banks are willing to submit this kind of control to money-dealers is that, by concentrating the technical operations related to the processes of purchase and payment, MDC allows for a reduction of the 'section of capital [that] must always be present … as a reserve of means of purchase and payment' (Marx 2015, 426).

> [T]he reserve fund of means of purchase and payment, if managed on behalf of the capitalist class as a whole, does not need to be as great as if each capitalist had to administer his fund separately […] Money-dealing mediates the settlement of accounts, in so far as money functions as means of payment, and by the mechanism it creates for these settlements it reduces the quantity of money these require (Marx 2015, 426–27).

By reducing the necessary amount of gold reserves, the MDC's management of the process of money circulation also leads to an increase in the rate of profit of E1 and E2. And, crucially, the greatest possible decrease in the economy's reserve fund was obtained when the bank not only 'mediate[d] the settlement of accounts', but also *issued* the liabilities by means of which non-bank agents setted their accounts.

2.3 Profit and the creation of credit money

As demonstrated in the previous section, the emergence of institutions which, unlike E1, E2, W1 and W2, *specialize* in issuing credit instruments which serve as means of purchase and payment (see Figures 2, 3 and 4) allows for a considerable reduction in the reserve fund of the economy, and thus also for a substantial increase in the rate of profit of E1 and E2. What is yet to be demonstrated, however, is why the bank would be willing to perform such a charitable service to other private enterprises. The answer, of course, is that the bank too makes a profit out of its operation. But this raises two important questions: first, what form does the bank's income take? And second, how does the introduction of the bank's income affect the rate of profit of E1 and E2?

Let us first see how the bank can profit from its money-dealing activities. As is well known, banks charge interest when they make loans. What determines the rate of interest they charge? For Marx, 'interest is simply a part of profit'; hence, 'the average rate of profit should be considered as the *ultimate determinant [Bestimmende] limit* of interest' (Marx 2015, 461–63, translation modified). Yet, Marx is adamant that:

> even taking the average rate of profit as given ... [t]here is no reason at all why the average conditions ... should give the moneylender an interest of 3, 4, 5, percent, etc., on his capital, or alternatively *a certain percentage*, 20 percent or 50 percent, *of the gross profit* … The prevailing *average rate of interest … cannot be determined by any law.* (Marx 2015, 466)

Thus, 'the determination [of the interest rate] is inherently *accidental, purely empirical*' (Marx 2015, 466): as Marx puts it, the rate of interest is 'determined by *the supply and demand of moneyed capital*' (Marx 2015, 466, 517), and the latter cannot be strictly derived from the rate of profit. A detailed analysis of the determinants of the supply and

demand of moneyed capital is beyond the scope of this article. [16] It is worth noticing, however, that one of the factors determining the supply and price of moneyed capital is the degree of competition in the banking sector. In our previous examples, we assumed that one institution monopolized the banking business. Now, a more realist assumption would be that there is more than one bank in the economy.

The fact that a bank faces competition imposes constraints on the interest rate it can charge. Just as importantly, it also entails that any individual bank is subject to the possibility of losing out deposits to other banks. If we assume (for simplicity's sake) that there is no interbank credit, then any loss of deposits means will force the bank to redeem its liabilities against gold. Recall, however, that the bank's "historical task" was precisely to reduce the amount of gold that was necessary for the process of expanded reproduction (thus increasing the economy's rate of profit); and that it did so by raising the ratio of deposits to gold in its balance sheet. Put differently, *the bank is structurally unable to redeem all its deposits* (in Figure 4, for instance, only 1 out each 40 deposit units can be redeemed against gold). Hence, the bank strives to retain as many deposits in its balance sheet as possible; and the primary way it does so is by paying out interest on deposit accounts.

With these considerations in mind, let us analyze how the bank profits from its activities. Figure 5 introduces the category of interest and aggregates the sectors to focus on the relationship between non-banks and banks:

[16] On this topic, see Höfig (2019, 167–70).

FIGURE 5

Banks				Enterprises				Workers				
ASSETS		LIABILITIES		ASSETS		LIABILITIES		ASSETS		LIABILITIES		
Gold	5	Equity	5	Means of production	160	Equity	160		0		0	(1)
Loan to E	200	Deposits W	200 + Y/3	~~Means of production~~	~~160~~	Loan	200	Deposits	200 + Y/3	Equity	200 + Y/3	
Interest receivable	X/3			Saleable CG	200	Owed interest	X/3					(2)
Gold	5	Equity	5 + X/3 - Y/3	Saleable MP	200	Equity	200 - X/3					
Loan to E	200	Deposits W	Y/3	~~Saleable CG~~	~~200~~	Loan	200	Deposits	~~200 +~~ Y/3	Equity	~~200~~ + Y/3	
Interest receivable	2X/3	Deposits E	200 + Y/3	Deposits	200 + Y/3	Owed interest	2X/3					(3)
Gold	5	Equity	5 + 2X/3 - 2Y/3	Saleable MP	200	Equity	200 + Y/3 - 2X/3					
Loan to E	200	Deposits W	Y/3	Deposits	200 + 2Y/3	Loan	200	Deposits	(Y/3)*[(1+Y/2)/3]	Equity	(Y/3)*[(1+Y/2)/3]	
Interest receivable	X	Deposits E	200 + 2Y/3	~~Saleable MP~~	~~200~~	Owed interest	X					(4)
Gold	5	Equity	5 + X - Y	Means of production	200	Equity	200 + 2Y/3 - X					
~~Loan to E~~	~~200~~	~~Deposits E~~	~~200 + 2Y/3~~	~~Deposits~~	~~200 + 2Y/3~~	~~Loan~~	~~200~~	Deposits	(Y/3)*[2*(1+Y/2)/3]	Equity	(Y/3)*[2*(1+Y/2)/3]	
New loan to E	X-2Y/3	Deposit W	Y/3	Means of production	200	New loan	X - 2Y/3					(5)
Gold	5	Equity	5 + X - Y			Equity	200 - X + 2Y/3					

Comments:

1. To simplify, we assume there is no compound interest.
2. X is the interest charged on a 200 loan for the whole period. Y is the interest paid on a 200 deposit for the whole period
*Hence, the rate of interest banks charge on loans is (X/2)%, whereas the rate deposit holders are paid is (Y/2)%
3. The bank's net income is (X - Y), **which is different from the interest charged (X)**.
4. In equilibrium, the rates of profit of the enterprises and the bank must be the same, i.e., [(X-Y)/5] = [(40 - X + 2Y/3)/360]
* Given that there is no natural rate of interest, we can solve for any exogenously determined X.
For instance, suppose **the rate of interest charged on loans is 5%**. Then X = 10, Y = 9.91 and **the rate of profit is 1.66%**
Or suppose **the rate of interest charged is 3%**. Then X = 6, Y = 5.48, and **the rate of profit is 10.45%**
Suppose, finally, that **the rate charged is 2%**. Then X=4, Y=3.47 and **the rate of profit is 10.64%**

Notice, first, that although the banks do extract interests from enterprises, their *net* income is not equal to interest as such, but rather to the spread between the interest they charge on loans and the interest they pay out to depositors. *This spread constitutes the banks' profits*,[17] and the banking sector's rate of profit, as can be seen in Figure 5, is *the same as the rate of profit the E1 and E2 obtain from their investments*. Note moreover that, since there exists no natural rate of interest, we can find the profit rates that result from different exogenously determined interest rate (given, of course, the rate of surplus value). For instance: if the rate of interest is 2%, then the rate of profit is 10.64% – a higher rate than the one obtained in Figure 2, when enterprises did not share the surplus value with the banking sector but were forced to retain a relatively large amount of gold in their vaults. On the other hand, if the rate of interest is 3%, the rate of profit is only 10.45% – i.e., less than would have been obtained in an economy without banks. Hence, even though the banks absorb part of the surplus value extracted from workers by the enterprises, *the*

[17] This is so because gold does not depreciate, and, by assumption, the banks used all their equity to acquire gold. Had the banks acquired variable capital or other forms of (depreciable) constant capital, then their profits would be smaller than the spread, and they would need to charge an even larger spread so as to achieve the average rate of profit.

banking sector's operation can still increase the enterprises' rate of profit of, depending on the prevailing interest rate.[18]

In short, the search for profits is the engine behind the creation of credit money: by issuing claims on ultimate money that are redeemable at par and on demand, banks (may) increase the rate of profit of non-bank capitalist enterprises while also profiting from this operation. This is not to say that the emergence of credit money comes without costs. The fact that banks are structurally unable to redeem all their liabilities entails that, while increasing the economy's rate of profit, bank-money issuance also raises its instability, particularly when the issuance of credit money coalesces with the capitalist system's inner tendency to generate sequential phases of rising and falling rates of profit. And this creates a tension: to raise the rate of profit, banks must reduce their reserves of gold; if, however, they go too far in this direction, banks can also destabilize the economy, jeopardizing the reproduction of the capitals whose rate of profit its activities are supposed to increase.

2.4 Credit money and the growing complexity of the chain of monetary instruments

To understand the tension outlined above, let us go back to the case depicted in Figure 5, but now assuming there are two banks in the economy: Bank 1 (B1) and Bank 2 (B2). Suppose E1 and W1 have accounts at B1, whereas E2 and W2 have accounts at B2;[19] and that gold reserves are evenly split between the banks. The process of expanded reproduction of such an economy is depicted in Figure 6.[20]

[18] This raises the question of *who profits from higher rates of interest.* On this topic, see Höfig and Müller (2022).

[19] Due to space considerations, the balance sheets of W1 and W2 were excluded.

[20] From this point onwards, we abstract from interest payments once again.

FIGURE 6

Bank 1		Bank 2		Enterprise I		Enterprise II		
ASSETS	LIABILITIES	ASSETS	LIABILITIES	ASSETS	LIABILITIES	ASSETS	LIABILITIES	
Gold 2.5	Equity 2.5	Gold 2.5	Equity 2.5	Means of production 80	Equity 80	Means of production 80	Equity 80	(1)
Loan to E1 100	Deposits W1 100	Loan to E2 100	Deposits W2 100	~~Means of production 80~~	Loan 100	~~Means of production 80~~	Loan 100	(2)
Gold 2.5	Equity 2.5	Gold 2.5	Equity 2.5	Saleable goods 200	Equity 100	Saleable goods 200	Equity 100	
Loan to E1 100	~~Deposits W1 100~~	Loan to E2 100	~~Deposits W2 100~~	~~Saleable goods 200~~	Loan 100			
Loan to B2 100	Deposits E1 200		Loan from B1 100	Deposits 200	Equity 100			(3)
Gold 2.5	Equity 2.5	Gold 2.5	Equity 2.5					
Loan to E1 100	Deposits E1 100		~~Loan from B1 100~~	Means of production 100	Loan 100	Means of production 100	Loan 100	
~~Loan to B2 100~~		Loan to E2 100	Deposits E2 100	Deposits 100	Equity 100	~~Saleable goods 200~~		(4)
Gold 2.5	Equity 2.5	Gold 2.5	Equity 2.5			Deposits 100	Equity 110	
~~Loan to E1 100~~	~~Deposits E1 100~~	~~Loan to E2 100~~	~~Deposits E2 100~~	Means of production 100	~~Loan 100~~	Means of production 100	~~Loan 100~~	(5)
Gold 2.5	Equity 2.5	Gold 2.5	Equity 2.5	~~Deposits 100~~	Equity 100	~~Deposits 100~~	Equity 100	

* **Rate of profit (total social capital)** = 40/365 = 10,95%

The process of expanded reproduction in Figure 6 is similar to the one depicted in Figure 5: non-bank agents make the same payments, and the rate of profit is unchanged. There is, however, one important difference: the introduction of a new claim from and on banks, i.e., the "loan" from B1 to B2. Because the payments from the clients of B1 and B2 do not cancel out simultaneously, the flow of payments can only keep running smoothly because B1 accepts to "convert" deposits from B2 into its own deposits in exchange for claims on the gold reserves held by B2. This illustrates an important principle: if there are several banks in the economy, then the banking system's ability to economize on the money-commodity depends on individual banks' willingness to expand their balance sheets by issuing claims on one another and deferring the settlement of such claims when they exceed gold reserves.

Through interbank credit, banks can partially overcome the tension outlined above: instead of holding more gold, they can hold claims on one another and defer settlement until the latter cancel out. If there exists a functional interbank lending market, then the deposit liabilities of individual banks become practically fungible; this, in turn, reduces the probability that non-bank agents will convert their claims into gold, since they can now make payments by merely transferring deposits.

It is important to notice, however, that such arrangement does not fully solve the structural inability of banks to redeem their liabilities, but merely *displaces* the problem to a higher level in the monetary hierarchy. If B1 were not willing to defer the settlement of B2's liabilities (say, because it considers that B2 has issued too many liabilities relative to its reserves), deposit fungibility would disappear, B2 would be prey to a bank run and its

deposits would lose the character of gold-substitutes. Since banks often advance credit to one other, the run could easily spread to other banks, bringing down the monetary system and the process of expanded reproduction of which the latter is an integral part.

Yet, there is still another way to deal with the structural inability of banks to redeem their liabilities: the establishment of a higher level in the hierarchical network of monetary instruments and the displacement of the tension upwards in the hierarchy. Suppose that, instead of making payments directly to one another, the banks deal with a clearinghouse (C) which issues deposits that are redeemable against gold at par and on demand. Suppose further that B1 and B2 do not hold their gold reserves directly, but rather deposit them at C, and that the banks' liabilities are convertible not into gold, but rather into the instruments issued by C. Figure 7 depicts the process of expanded reproduction of such an economy:

FIGURE 7

Clearing house		Bank 1		Bank 2		Enterprise I		Enterprise II		
ASSETS	LIABILITIES	ASSETS	LIABILITIES	ASSETS	LIABILITIES	ASSETS	LIABILITIES	ASSETS	LIABILITIES	
Gold 5	Deposits B1 2.5 Deposits B2 2.5	Deposits C 2.5	Equity 2.5	Deposits C 2.5	Equity 2.5	Means of production 80	Equity 80	Means of production 80	Equity 80	(1)
Gold 5	Deposits B1 2.5 Deposits B2 2.5	Loan to E1 100 Deposits C 2.5	Deposits W1 100 Equity 2.5	Loan to E2 100 Deposits C 2.5	Deposits W2 100 Equity 2.5	~~Means of production 80~~ Saleable goods 200	Loan 100 Equity 100	~~Means of production 80~~ Saleable goods 200	Loan 100 Equity 100	(2)
Gold 5 Loan to B2 97.5	Deposits B1 102.5 ~~Deposits B2 2.5~~	Loan to E1 100 Deposits C 102.5	~~Deposits W1 100~~ Deposits E1 200 Equity 2.5	Loan to E2 100 ~~Deposits C 2.5~~	~~Deposits W2 100~~ Loan from C 97.5 Equity 2.5	~~Saleable goods 200~~ Deposits 200	Loan 100 Equity 100			(3)
Gold 5 ~~Loan to B2 100~~	Deposits B1 2.5 Deposits B2 2.5	Loan to E1 100 Deposits C 2.5	Deposits E1 100 Equity 2.5	Loan to E2 100 Deposits C 2.5	~~Loan from B1 97.5~~ Deposits E2 100 Equity 2.5	Means of production 100 Deposits 100	Loan 100 Equity 100	Means of production 100 ~~Saleable goods 200~~ Deposits 100	Loan 100 Equity 110	(4)
~~Loan to E1 100~~ Gold 2.5	~~Deposits E1 100~~ Equity 2.5	~~Loan to E1 100~~ Deposits C 2.5	~~Deposits E1 100~~ Equity 2.5	~~Loan to E2 100~~ Deposits C 2.5	~~Deposits E2 100~~ Equity 2.5	Means of production 100 ~~Deposits 100~~	~~Loan 100~~ Equity 100	Means of production 100 ~~Deposits 100~~	~~Loan 100~~ Equity 100	(5)

* **Rate of profit (total social capital)** = 40/365 = 10,95%

The introduction of a clearinghouse which settles the transactions between B1 and B2 has a fortunate consequence: it increases the ratio of gold to claims on gold both within individual balance sheets and in the economy as a whole. Whereas in Figure 6 such ratio reaches the level of 2.5/200 for B1 and 5/300 for the economy (line 3), in Figure 7 the coverage ratio never goes below 5/102.5, both for C and for the economy as a whole (since C liabilities are now the only direct claims on gold in the economy). Were the economy depicted in Figure 7 to operate with a coverage ratio that is equal to the one found in Figure 6, then C would be able to lower the reserves in its vaults to 1.7 gold units, thus raising the economy`s rate of profit to 11.05%. Were C to operate with a coverage ratio that is equal to the one obtained by B1 in Figure 7, the gold reserves would

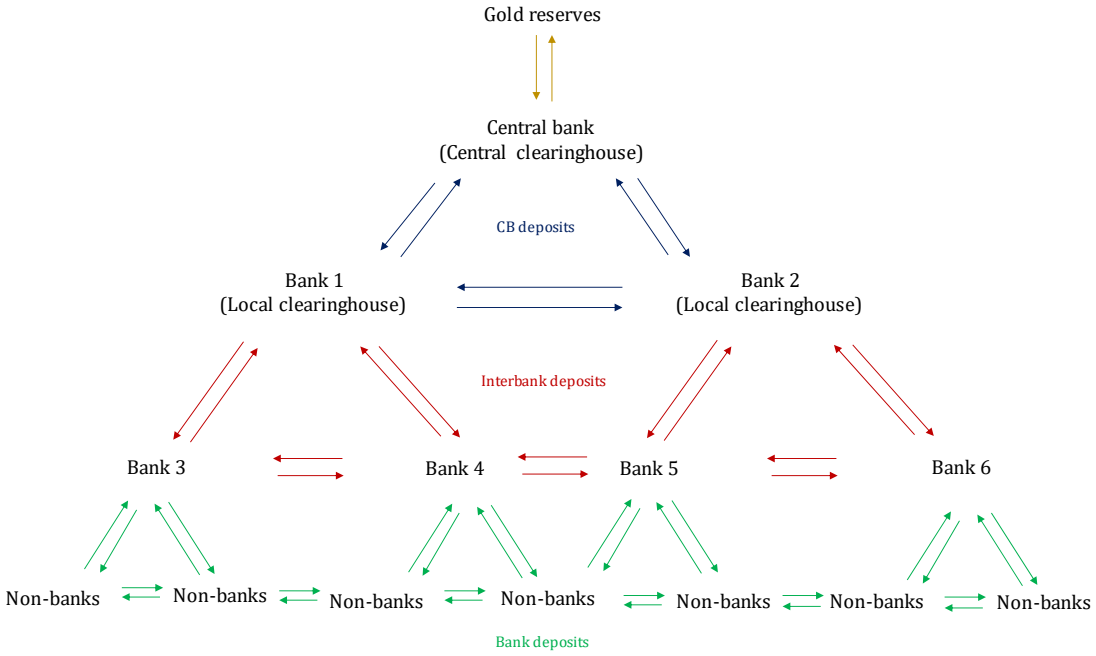
decrease to 1.28 gold units, raising the economy's rate of profit to 11.07% – *practically the same as when agents operated with no gold reserves at all* (see Figure 1).

Note that the two ways of dealing with the tensions arising from the existence of multiple banks are not mutually exclusive. Rather, they reinforce one another: the introduction of a central clearinghouse that is willing to back bank liabilities by issuing claims on ultimate money tends to increase the banks' disposition to extend interbank credit. This means that the introduction of C allows the economy to reduce the gold reserves even further without causing the ratio of reserves to claims on gold to fall.

Note, moreover, that the extent to which the introduction of a clearinghouse allows the system to economize on reserves is much larger than shown in the example above, in which there are only two banks. In a more realistic setting, there would exist several banks, which would mediate the payments of a much larger number of workers and enterprises. Suppose there are three banks (B1, B2 and B3) and that B1's clients make payments worth 100 gold units to the clients of B2, whereas B2's clients make payments worth 100 gold units to the clients of B3, and the latter's clients make payments worth 100 gold units to the clients of B1. In the absence of C, the amount of interbank credit (and therefore the size of the banking system's liabilities) would increase to 300. In the presence of C, however, the inflows and outflows of payment orders from and to each individual bank immediately cancel out, and the payments can be processed without any increase in the liabilities of B1, B2 and B3.

Note, finally, that the hierarchy of monetary instruments, which in Figure 7 expanded upwards on the basis of the operations of B1 and B2, can also expand downwards, with the introduction of other banks that settle their mutual claims through the balance sheets of B1 and B2 (see Figure 8). In this manner, B1 and B2 are transformed into correspondent banks, functioning as local clearinghouses that play a similar role towards banks in the lower levels of the monetary hierarchy as C plays in relation to themselves (Figure 8). This allows the economy to operate with even fewer gold reserves relative to the amount of bank deposits, prompting a further rise in the rate of profit.

FIGURE 8



3 On the logic and the history of the capitalist monetary system

The conceptual framework presented in the previous sections does not immediately coincide with the historical development of monetary forms and practices within actual capitalist economies. Note, first, that many of the instruments introduced above are not creatures of capitalism. Already in the 14th century, Venetian banks had transformed 'orders-to-pay (a sort of cheques) and bank transfers' into 'standard means of payment even for the lower middle class' (Ugolini 2017, 17). Also in Venice, '[b]ills of exchange were customarily made payable at the "banks" proper — namely, at the transfer banks (banchi di scritta) that operated on the Rialto Square and cleared payments with one another', which also meant that in the Venetian banking system 'the clearing of interbank payments' took place 'on a continuous (daily) basis, not on a one-time basis as in fairs' (Ugolini 2017, 37–38). In the same manner, the 'practice to pay bills of exchange not in cash, but through the assignment "out of bank" of other bills falling due by third parties' (Ugolini 2017, 55) had also become common in Amsterdam by the beginning of the 17th century, as had the practice of bill discounting.

Note, moreover, that the previous section neglected several financial instruments that were crucial to the historical development of capitalist monetary systems. In England, for instance, where the capitalist mode of production first took root, 'deposit banking remained unknown before well into the seventeenth century' (Ugolini 2017, 58). To economize on cash, 16th century merchants and commodity producers adopted transferable bills of exchange as means of payment in extended commercial chains. As the inability of producers and merchants to assess the credibility of inland bills restrained the latter's use circulation in ever expanding markets, agents adopted another form of private, transferable liability: e.g. banknotes (Knafo 2013, 88–91; Ugolini 2017, 61). Such banknotes, in turn, promised convertibility at par and (practically) on demand against yet other key instruments that have been omitted in this paper up to this point, i.e., coins minted by the Royal Mint.

This brings us to yet another missing element in the story put forward in the previous section: the state. As pointed out by Desan (2014), the transformations in the fiscal apparatus of the state from the 11th century onwards played a key role in the monetization of precious metals in pre-capitalist England. The state was also instrumental in making private agents acquainted with the use of credit money as means of payment:

> since at least the twelfth century, the King's Exchequer had issued certificates of deposit (under the form of wooden sticks called tallies) that were eligible for tax payments: as they were assignable to third parties, tallies were used as a medium of exchange in decentralized transactions (Ugolini 2017, 188).

The state also played a crucial role in the institutionalization of the hierarchy of monetary instruments in England. First, it suppressed institutions which refused to be integrated into the lower tiers of the British monetary system, such as the so-called country banks, which insisted on issuing notes well into the 19th century rather than relegating this function to the Bank of England (BoE) (Knafo 2013, chap. 6). Second, the state chartered the BoE and made its liabilities into legal tender, positioning the latter on the top of the British (and the world's) hierarchical monetary system. Finally, once the importance of the BoE's role as the system's central clearinghouse became clear to lawmakers, the state actively pushed the BoE to act as lender of last resort and oversee the activities of banks situated in the lower tiers of the British monetary system (ibidem). Eventually, like most

capitalist countries, the clearinghouse took up the form of a central bank that not only issues currency and the means of final settlement in interbank transactions, but also regulates the activities private banks are allowed to perform – among other things, by fixing (or trying to fix) the level of bank reserve and the amount of leverage banks can take up.

It is clear, therefore, that the conceptual framework developed in the previous section does not adequately describe the historical evolution of monetary practices, instruments and institutions under capitalist conditions. It is our contention, however, that it does capture the logic of such development. In fact, it is only by explicitly acknowledging how that the constitution of a capitalist mode of production radically repurposes, reshapes and recreates monetary instruments and practices that one can properly understand the forces that have underpinned the evolution of national and international monetary system in the past two centuries.

This means, among other things, that although the state does play a key role in the development of monetary system, the long-run tendencies which shape the evolution of monetary systems arise ultimately from the inner logic of the process of capitalist expanded reproduction. Thus, whereas the English state monetized precious metals by making coined metals into the means of tax settlement, the state could not by itself give such instruments the attribute which defines money in contemporary settings, i.e. that of functioning as *general equivalent* for all goods and services in the economy. Rather, it is only when labor power has overwhelmingly acquired the character of a commodity owned by the workers themselves that production can predominantly acquire the character of *commodity production*. Only when they are produced as commodities can goods and services acquire the attribute of one-dimensional values; and, in turn, it is only when goods and services generally belong to this dimension that they can relate to money as their universal equivalent – and, as such, as the socially valid form of expression of ordinary goods and services' values. Hence, the state can monetize instruments in pre-capitalist settings; it cannot, however, transform these monetary instruments into general equivalents – which is one of the defining features money acquires within capitalist economies.

In the same manner, the state plays a key role in institutionalizing the hierarchical network of monetary instruments by means of which enterprises and workers make payments to one another in actual capitalist economies. The impulse for the constitution of such a hierarchical structure, however, cannot be derived from the state itself; rather, as demonstrated in the previous section, such an impulse is intrinsic to capitalist economies. Once the capitalist mode of production sets in, commodity production becomes generalized, and agents are increasingly forced to engage in monetary market relations to materially reproduce themselves (Wood 2016). Not only that, once production has generally acquired a capitalist nature, competition acquires a new role, as enterprises are continuously forced to beat their rivals so as to ensure that their investments will be profitable and that they will be able to remain in business. In such settings, reducing costs becomes a matter of survival, and enterprises are pushed to continuously look for ways of economizing on the use of specie. This explains why, once wage relations become widespread, enterprises tend not only to incorporate pre-capitalist monetary instruments (such as bills of exchange, banknotes and deposits) as the usual means of settling their transactions, but also to search for ever new instruments that allow them to economize on specie – be this by acquiring deposits in lower-tier banks (for instance, banks operating in the Eurodollar system, whose liabilities promise convertibility against dollar deposits within the official dollar system), by acquiring money market fund shares, or by purchasing assets that can easily be transformed into bank deposits by means of repurchase agreements.

As this brief list of monetary instruments suggests, the main method by which money-dealing capitalists satisfy the demand for cheaper means of exchange and payment is by issuing instruments that promise convertibility at par and on demand against other instruments situated at the higher tiers of a *layered and hierarchically structured network of monetary instruments*. By introducing new layers into the monetary hierarchy,[21] money-dealing capitalist can not only make a profit for themselves, but also allow other agents to make ever more payments on the basis of a (relatively) shrinking reserve of commodity-money – which, incidentally, also raises the rate of profit of capital as a

[21] On the hierarchical nature of monetary systems, see Mehrling (2012).

whole. To be sure, this also increases the risks of inflationary bouts and financial crises, which is precisely why the state often looks for ways of reshaping of this hierarchical structure. It is important to emphasize, however, that the impetus to create such hierarchy responds to the *inner logic* of the capitalist economy, which is always pushing for the introduction of new ways of reducing costs and raising the rate of profit.

That this impulse is intrinsic to the capitalist mode of production is made clear by the monetary evolution of the two hegemonic powers that have arisen over the history of capitalism: the United Kingdom and the United States. In 16th century England, as capitalist production relations spread around the country and members of all classes became ever more dependent on monetary market exchange for their survival (Wood 2016), currency scarcity soon became acute, and individuals resorted to informal bookkeeping credits and localized clearing systems as a means to ensuring the circulation of commodities (Muldrew 1998). Yet, the inability of these mechanisms to solve the problems arising from increasingly complex capitalist market structures soon became clear, and merchants were led to adopt tradable bills of exchange as a substitute for coined metals in their mutual payments (Ugolini 2017, 61; Wennerlind 2011, chaps. 1–2). As merchants found it hard to assess the credibility of circulating bills, bankers ended up assuming a key role in evaluating and eventually *discounting* the latter. Over time, this gave rise a new layer in the hierarchy of monetary instruments in England, as bankers progressively handed out banknotes instead of coins when discounting bills, and bank liabilities became increasingly accepted as means of exchange and payment across English markets (Knafo 2013, 54; Ugolini 2017, 61).

After the creation of the BoE, London bankers were forbidden from issuing notes; they thus resorted to issuing deposits, which in turn could be redeemed against BoE liabilities or used directly to make payments through cheques and drafts (Knafo 2013, 115; Ugolini 2017, 61–62; Quinn and Roberds 2008). In time, banks outside of London would also adopt such techniques, albeit with some reluctance: country banks, for instance, kept issuing notes well into the 19th century, and often redeemed the latter against specie, rather than BoE notes (which by then were already legal tender). On the other hand, the joint stock banks which came to dominate the banking system outside of London in the second half of the 19th century did not issue notes, and made their deposits redeemable against

instruments issued by BoE (Knafo 2013, chap. 6). In this manner, deposits transfers replaced private banknotes as means of exchange and payment in nonbank exchange relations. The banks themselves, however, adopted other means of settlement in their engagements with one another: joint stock banks, for instance, tended to settle their mutual claims using balances in London, but only after *netting* such claims through their local clearinghouse. Similar methods were adopted by London banks, which cleared their mutual liabilities through their privately organized clearinghouses and settled the remaining claims using instruments issued by the BoE (Ugolini 2017, 62–68). Crucially, it was only by the mid-19th century that the BoE took some responsibility for organizing the settlement of interbank claims (Knafo 2013, chap. 6) – which suggests, once more, that the impulse to create a hierarchical monetary network arises organically with the development of capitalism, regardless of the intentions of public regulators.

That the interaction of private enterprises searching for higher rates of profits tend, once capitalist production relations set in, to give rise to a layered network of monetary instruments and institutions can also be glimpsed from the US case. The US monetary system evolved quite differently from the English one. First, privately issued money played more important role in the early stages of development of the US monetary system than they did in the UK (Jaremski 2020). The business issuance and discounting of bills was never as prevalent in the US as in the UK (Konings 2014); private banknotes, in turn, mediated payments from an early stage, and would not stop doing so until after the creation of the Federal Reserve System in 1913 (Dwyer 1996; Jaremski 2020; Weiman and James 2020).

Second, contrary to the UK, the US political and economic systems were highly fragmented, which left an imprint on the circulation of private monetary instruments: banknotes could circulate easily in local environments, but could hardly circulate at par in wider circles (Jaremski 2020, 458). This created the opportunity for the introduction of new layers into the US monetary network: private note brokers, for instance, could arbitrage away part of the discount over banknotes by purchasing the latter and redeeming them directly at the issuing bank (ibidem). Most importantly, the banks sought to promote the circulation of their notes at par by establishing correspondence relations among themselves. Particularly important here is the Suffolk System, lasting from 1818 to the

1850s, which offered to clear the notes of participating banks at par, so far as they held funds in an account at the Suffolk Bank (Weiman and James 2020, 723).

This early push toward the hierarchization of monetary networks gained an even stronger impulse in the 1860s, with the National Banking Acts. The latter:

> established a more integrated interbank payments network through a tiered hierarchy of redemption agents, corresponding to federally chartered banks located in an officially designated "central reserve" city (at the time only New York) and 16 regional "reserve" centers … "Country" banks located outside of these official centers were required to maintain sufficient note redemption reserves with an approved agent in an economically proximate reserve center where their notes tended to accumulate. Likewise, reserve city banks were mandated to hold redemption reserves with an approved agent in New York. (Weiman and James 2020, 726–27)

The establishment of this tiered monetary infrastructure allowed the nascent US capitalist economy to produce an ever-increasing number of monetary instruments on the basis of a (relatively) decreasing amount of ultimate money. First, local banks' claims on one another would be netted out in the numerous local clearinghouses established across the country in the 19th century (Jaremski 2020; Weiman and James 2020); resulting claims could then be cleared in the reserve centers before been sent to New York, where banks could settle using deposit certificates issued the New York Clearinghouse Association (NYCHA) – which, in turn, were redeemable against gold (Gorton 1985).

By the time this hierarchical network was fully established, most bank liabilities to nonbanks took on the form of deposits (instead of notes), which also meant that cheques were playing and increasingly important role in mediating payments among nonbanks. Crucially, the fact that only a small share of the cheques drawn on lower-tier banks reached the NYCHA allowed the latter not only to operate with relatively small reserves, but also to establish lending channels to member banks in periods of stress. In this manner, such privately established central clearinghouses developed features that we now associate with central banks. After the 1907 crisis, the inability of this arrangement to sustain the circulation of bank liabilities at par became apparent (Andrew 1908), and demands for the establishment of an actual central bank became more pressing (Konings 2014). The response was the passage of the Federal Reserve Act, which nationalized the roles of New York correspondents and the NYCHA in the interbank settlement system.

In the following years, the Fed would play a key role in institutionalizing the hierarchical structure which had risen in the previous century (Weiman and James 2020, 737). As this brief description suggests, however, the impulse for the hierarchization itself precedes the institution of the US monetary authority by a long shot.

The capitalist impulse toward the development of a hierarchically structured network of monetary instruments and institutions is also apparent in the international monetary orders which arose around the British and the US currencies in the 19th and 20th centuries. As seen above, by the 19th century, the tiered structure of the British monetary system was already fundamentally established. However, such system did not rest within the frontiers of the UK; rather, it expanded through the functional attachment of lower-tier, offshore layers into the British monetary infrastructure. This was done in two manners: first, through the offshore issuance of pound-denominated bills discountable in British financial centers; and second, by the pegging to the pound of non-British currencies (backed by pound-denominated assets; see Eichengreen 2008, chap. 2), which meant that such currencies promised convertibility at par and on demand against British-banks liabilities.

These two modes of integration of offshore centers were not as important in the expansion of the international dollar system. As seen above, US banking institutions, which did not play as central a role in mediating international payments, were never as active in the business of discounting as their British counterparts. Moreover, monetary instruments denominated in other currencies could never play a similar role in the dollar system as they did in the pound system: prior to 1971, most currencies were pegged to the dollar, but convertibility was limited; after 1971, currency convertibility was restored, but exchange rates did not enjoy the levels of stability that would allow instruments denominated in other currencies to credibly promise convertibility against dollar deposits.[22] That, however, did not prevent the dollar system from expanding offshore by developing new, lower-tier layers: from the 1950s onwards, banks (and shadow-banks) around the world have satisfied the foreign demand for dollars by issuing Eurodollars, i.e.

[22] To an extent, FX derivatives markets do allow non-dollar monetary instruments to play this role.

offshore dollar-denominated instruments that promise convertibility at par and (practically) on demand against deposits in the United States (McCauley, McGuire, and Wooldridge 2021; Thompson 2022, chap. 4).

Hence, both within countries and at the international level, the historical development of capitalist monetary systems in the past few centuries displays a tendency towards the constitution of hierarchical networks of monetary instruments and institutions. As this layered infrastructure evolves, the actual instruments employed by capitalists and enterprises in their monetary handlings become increasingly decoupled from existing reserves of the money-commodity. Indeed, by the time the pound- and the dollar-centered gold standards came to an end, respectively in 1914 and 1971, the share of monetary instruments that could actually be redeemed against gold was negligible (Bordo and McCauley 2017).

Marx's conceptual framework reveals exactly why such tendency toward decoupling arises: once the capitalist mode of production takes root and enterprises come to depend on monetary market exchange for their survival, there arises a pressing need to reduce circulation costs, which creates a continuous demand for mechanisms allowing agents to economize on the use of ultimate money (which, in Marx's view, must necessarily be a product of labor). Marx's system hence allows for a rich understanding of the development of capitalist monetary systems before 1971, when gold was still positioned at the pinnacle of the (international) hierarchy of monetary instruments. But does it retain its explanatory power after 1971, when US central bank liabilities ceased to be convertible into gold and the (tenuous) link between gold and other monetary instruments was terminally cut? As we shall see in the next section, this question has a positive answer.

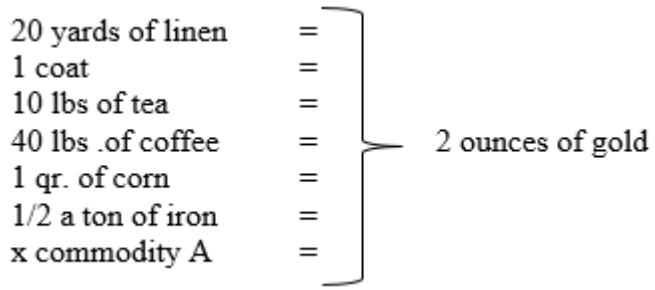
4 The demise of the gold standard and the rise of the price-index standard

Let us turn back to Marx's considerations on the relationship between value and money. Value, according to Marx, is a social property goods and services acquire when the *concrete* labors which produced are them reduced to *abstract* labor. The transformation of concrete labors into abstract labor, in turn, requires that the labors contained in ordinary goods and services be equated to the labor contained in a money-commodity, which thereby functions socially as the incarnation of labor as such. This, however, can only be achieved indirectly, through the equalization of each individual good and service in the economy to the money-commodity, which thereby is socially positioned as a general equivalent.

> The innumerable equations of which the general form of value is composed equate the labour realized in the [money-commodity] with the labour contained in every other commodity in turn, and they thus convert [the concrete labor that produces the money-commodity] into the general form of appearance of undifferentiated human labour. In this manner the labour objectified in the values of commodities is not just presented negatively, as labour in which abstraction is made from all the concrete forms and useful properties of actual work. Its own positive nature is explicitly brought out, namely the fact that it is the reduction of all kinds of actual labour to their common character of being human labour in general, of being the expenditure of human labour-power. (Marx 1990, 159–60)

Marx's reasoning is graphically expressed in Figure 9, which represents the fully developed value-form – or, as Marx also puts it, the money-form.

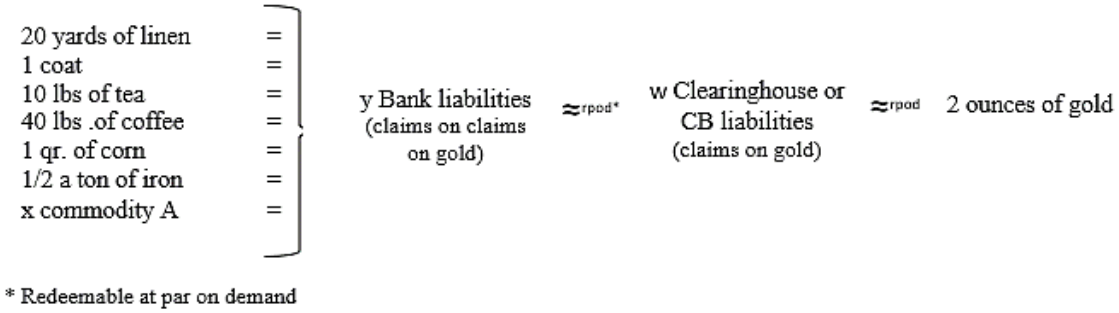
FIGURE 9



As depicted in Figure 9, multidimensional use values can only acquire a one-dimensional value-form by relating *as equals* to the money-commodity – a role which, both in Marx's

framework and in the actual capitalist world, was usually performed by gold. We have seen, however, that in actual capitalist economies ordinary goods and services rarely if ever relate directly to gold; rather, they are usually exchanged for *claims* on gold – or, better yet, for claims on claims on gold. In other words, the money-form depicted in Figure 10 evolves with the capitalist mode of production: in a fully developed capitalist economy, the relationship between ordinary goods and services and the money-commodity is usually mediated by a series of intermediate monetary instruments, as depicted in Figure 10.

FIGURE 10

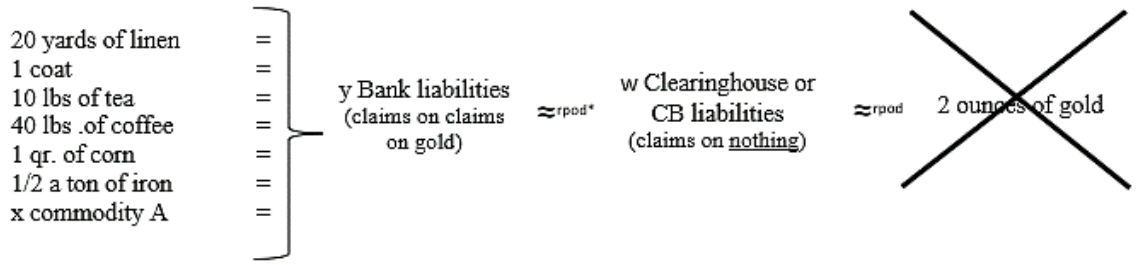


Compared to Figure 9, Figure 10 presents a much fairer representation of how the US (and the world's) monetary system functioned by the time Nixon closed the gold window. If anything, the relationship between gold and ordinary commodities expressed in Figure Y is still too poorly mediated: in 1971, capitalist enterprises and wealthy individuals already had access not only to US bank deposits (claims on claims on gold), but also to claims on US bank deposits (i.e., claims on claims on claims on gold) which also performed monetary functions, such as mutual fund shares, repurchase agreements and Eurodollar deposits (Menand 2022).[23] Hence, by the time the gold window was closed, the connection between ordinary commodities and the money-commodity had become extremely tenuous: on the one hand, most payments in the US and elsewhere were already executed through the transfer of second- or even third degree claims on gold (i.e., bank deposits; see Stella, Singh, and Bhargava 2021); on the other, the size of the deposits owned by non-bank private agents had already far surpassed the amount of gold they represented a claim on (Bordo and McCauley 2017).

[23] Note that, in the Bretton Woods system, Fed liabilities only partially represented claims on gold, since such instruments could be exchanged for actual gold exclusively by foreign central banks (indeed, private agents in the US were forbidden from hoarding gold coins or bullion between 1933 and 1974).

What changed, then, when Nixon closed the gold window? Figure 11 depicts this transformation:

FIGURE 11



* Redeemable at par on demand

As shown in Figure 11, the closing of the gold window meant that US CB liabilities ceased to represent claims on gold. This, in turn, transformed the very nature of bank deposits: whereas they earlier represented a second-degree claim on gold, they were now claims on instruments (i.e. central bank liabilities) which, as stated, were no longer redeemable against *any specific commodity*.[24]

As seen above, such transformation led even sympathetic scholars to the conclusion that Marx's monetary theory was incompatible with contemporary monetary arrangements: in their view, the fact that US CB liabilities were no longer redeemable against products of human labor made the existing monetary system incompatible with Marx's views on money. What such interpretations often neglect, however, is that the monetary system that emerged since the 1990s is quite different from the one that arose from the closing of the gold window. After 1971, as Fed liabilities became irredeemable and other currencies started to float against the dollar, inflation creeped and CBs took the blame,[25] which led policymakers to search for new monetary anchors. Adopting a monetarist stance, they first attempted to target monetary aggregates; but this soon proved problematic, and this path was abandoned already in the first half of the 1980s (Hetzel

[24] One could argue that, for US citizens, Fed liabilities still represent claims on tax obligations: whoever owns taxes to the US Treasury can redeem such obligations by handing in Fed liabilities. Yet, since foreign CBs (which often have accounts at the Fed) do not pay US taxes, this reasoning does not apply to them.

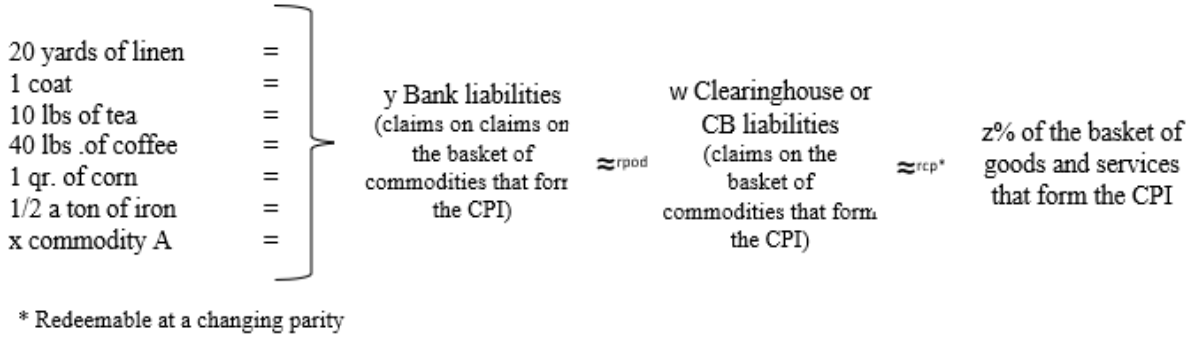
[25] The rise of US inflation in the 1970s is often blamed on the Fed's manipulation of the Phillips Curve (Hetzel 2020). Note, however, that the Fed did not exercise its newfound freedom only by trying to arbitrage between unemployment and inflation, but also by rescuing banks operating offshore that were caught in trouble after the Herstatt *affair* in 1974 (Minsky 1974). In practice, this transformed such banks' liabilities into contingent liabilities of the Fed, which in turn contributed to the explosive growth in Eurodollars in the second half of the 1970s. In our view, it is impossible to explain the inflationary waves of the time without referencing such phenomena.

2020). By the end of the decade, central banks in advanced capitalist economies began to convergence on a new strategic framework. In 1989, the central bank of New Zealand adopted a novel monetary policy regime, which became known as inflation-targeting regime (Carré 2014). The BoE and the Bank of Canada (among others) followed suit. Finally, the Fed, which is rightly regarded as the world's central bank (Tooze 2018; Murau and Klooster 2022), explicitly adopted an inflation-targeting regime in 2012 – although, it must be remembered, an implicit inflation-targeting had already been in place in the US for years (Hetzel 2020).

Now, once CBs adopt an inflation-targeting monetary regime, their liabilities cease to promise convertibility against nothing. *Within this policy framework, CBs effectively promise that their liabilities will be convertible into a specific basket of goods and services at a specific rate for a specific period of time*. Suppose, for instance, that a unit of the instruments issued by the CB can purchase, at the present, a certain basket of goods and services, which forms what is called a consumer price index (CPI). Suppose also that the CB has compromised itself to achieve an inflation target of 2%, calculated on the basis of the CPI. In such a setting, what the CB is effectively doing is promise that, in one year, its liabilities will be convertible into roughly 98% of the basket of goods contained in the CPI. In other words, the described monetary arrangement operates on the basis of a *price-index standard*.

Using Marx's graphical depiction of the money-form, the price-index standard can be described as follows (Figure 12):

FIGURE 12



Figures 12 and 10 are strikingly similar: in both, every good and service in the economy is convertible at certain rates into liabilities of private banks, and the latter are redeemable at par and on demand against the liabilities of the CB. The difference is that, whereas in the gold standard the CB promises that its liabilities will be convertible on demand into gold at a *fixed rate*, within the price-index standard, the CB promises that its liabilities

will be convertible into a given basket of goods and services (the CPI) at a *changing rate* – a rate which, however, changes at a *fixed pace*.

Hence, the gold and the price-index standards share a key property: in both, the liabilities of the CB are backed by products of human labor. Put differently, within the price-index standard, the goods and services that form the index perform – *collectively* – a role that is similar to the one performed by gold within the gold-standard, i.e., that of functioning as general equivalent. Paraphrasing Marx, one could argue that, within the price-index standard, the innumerable equations of which the general form of value is composed equate the labor realized in the items that compose the index with the labor contained in every ordinary commodity; in this manner, the vector of concrete labors that produce the items contained in the index is transformed into the general form of appearance of undifferentiated human labor, just like gold in the gold standard. By relating, through the mediation of private banks and CB liabilities, to the basket of goods and services that form the price index as their equivalents, each individual commodity equalizes the concrete labor contained in it to the labors contained in that basket; in doing so, they give the concrete labors contained in the index – *considered collectively as a unitary entity, i.e., as a vector* – the character of abstract human labor; this, in turn, *reflexively* reduces the diverse concrete labors contained in each ordinary commodity to abstract human labor, thus giving the useful things produced by labor the character of *values*.

To sum up, in both the gold standard and the price index-standard, the relationship between ordinary commodities and the item(s) that function(s) as general equivalent is not immediate, but rather mediated by instruments issued by private banks and the central bank. Moreover, and most importantly, in both standards, the equalization of the labors contained in ordinary commodities to the labors contained in the item(s) that function(s) as general equivalent constitutes a necessary moment in the social process of transformation of use values into values.

5 On the functionalities and dysfunctionalities of the price-index standard

The previous section demonstrated that the price-index standard operates in a manner that is often quite similar to the gold standard. This, in turn, suggests that the explanatory power of Marx's framework has not come to an end with the closing of the gold window. Indeed, the case could be made that the price-index performs the function of general equivalent more adequately than gold – entailing that, from the perspective of Marx's conceptual framework, the price-index standard fits even better with the structural determinations of the capitalist mode of production than the late gold standard. As seen above, the main function of the general equivalent is to provide an immediate, socially valid representation of social labor. Crucially, the basket of goods and services that constitute the price index provides for a far superior representation of social labor than gold; and this, in turn, means that the former can perform the role of general equivalent more adequately than the latter.

Let us see why. Because gold is non-perishable, the stock of gold produced by past labor is always, at any given time, far greater than the flows of new gold that are produced by current labor. Consequently, contrary to most other commodities – such, for instance, as the ones that form the CPI –, the value of gold depends to a greater extent on the socially necessary labor times that prevailed in the past than on the socially necessary labor time observed in the present. Put differently, contrary to the commodities in the CPI, the value of gold depends far more on the past than on the present productivity of social labor. In this sense, it can be argued that gold offers a rather distorted representation of social labor.

Such inability of gold to adequately represent social labor makes the gold standard rather dysfunctional, at least when compared to the price-index standard. For the fact that the value of gold depends more on past than current labor implies that any monetary standard in which gold functions as the general equivalent tends to be *deflationary*. As capitalism evolves and the labor productivity rises, the values of most commodities fall; but, because the value of gold is highly dependent on past labor, the relative value of gold tends to rise over time. Now, within the gold standard, monetary instruments such as bank deposits and CB liabilities are redeemable against gold at a fix rate. It follows that, over time, the rate of convertibility of ordinary commodities into monetary instruments tends to fall. Put

differently, *deflation is structurally baked into the gold standard*. The same, of course, is not true of the price-index standard: because the vector of commodities contained in the CPI provides a more accurate representation of current social labor, the price-index standard is neither necessarily deflationary, nor necessarily inflationary. This makes the price-index standard far more functional from the perspective of capital's expanded reproduction. After all, accumulation presupposes investment; and the latter, as has been known for a long time (Fisher 1933), is usually inhibited by deflationary tendencies which raise the real value of debt contracts over time. Moreover, the deflationary tendency intrinsic to the gold standard entails that, unless nominal wages are reduced, the value of labor power tends to rise over time. This prevents capitalists from adopting more indirect ways of reducing the value of labor power, which in turn may lead to increased tensions between capital and labor over time.

The fact that the price index standard is not necessarily deflationary is not the only property which makes it comparatively more adequate for the structural determinations of the capitalist mode of production. Another functional property of the price-index standard is that it allows the monetary authority to engage with financial markets in ways that were unthinkable in the gold standard. Contrary to many of the goods and services that constitute the price index, gold is usually traded in financial markets. This means that gold prices tend to be directly affected by changes in the price level of financial assets: if, for instance, all other assets in the market rise, investors will sooner or later rebalance their portfolios, pressuring gold prices upwards. The rise in the price of gold, in turn, puts pressure on the rate of convertibility between gold and the monetary instruments issued by the CB; to prevent parity from breaking up, the CB is then forced to raise the rate of interest – which, again, tends to have deflationary effects, as the prices of ordinary commodities in terms of bank deposits and CB notes decreases. It follows that, within the gold standard, the monetary authority will often refrain from rescuing financial markets in times of distress: were the CB willing to provide any sort of implicit guarantee of asset prices, then the latter would tend to rise, as investments in financial assets become less risky; and this, in turn, would ultimately have damaging deflationary effects over the economy.

The same is not true of the price-index standard. Within this regime, the effects of generalized changes in financial asset prices over the rate of convertibility between CB liabilities and the general equivalent are much more mediated than in the gold standard. Suppose that asset prices rise; how will this affect the price index? In such instances, the index may also rise, so long as asset inflation leads to more consumption; for that to happen, however, asset ownership must be somewhat well distributed – after all, high net worth individuals do not change their consumption habits as they become wealthier still. Put differently, so long as ownership is concentrated enough, asset inflation will not put any kind of pressure on the parity between CB liabilities and the price index. This means that, within the price-index standard, monetary authorities may enjoy much higher degrees of freedom in their engagement with financial markets, being able to rescue the latter when crises occur – which is precisely what the Fed has been doing at least since the Asian Financial Crisis. This, in turn, allows central banks (to some extent) to avoid some of the worst consequences of financial crises, such as the depressionary tendencies that tend to arise from stock market crashes and periods of asset deflation. It also creates the conditions for the political cooptation of large swaths of the middle classes in rich countries where the savings of these social groups have been invested in financial assets, such as the US and the UK (Adkins, Cooper, and Konings 2020).

Finally, the fact that the price index is a more adequate representation of social labor than gold allows the price-index standard to express the difference between price-level and relative prices much more clearly than was possible in the gold standard. Insofar as bank deposits and CB notes remain convertible into gold at a fix rate, any change in the relative price of gold will translate itself directly into changes in price level. The same, of course, is not true for the price index-standard: here, the role of general equivalent is performed not by a single commodity, but by a basket of commodities; hence, changes in the prices of some of these commodities will not necessarily disturb the price level, so long as the prices of other commodities in the basket change in the opposite direction. In other words, once the general equivalent is embodied in a basket of commodities, instead of a single commodity (as in the gold standard), the money-form acquires a much more developed capacity to accommodate changes in relative prices without translating them directly into moves in the price level – which, in turn, enhances the economy's capacity to withstand

supply and demand shocks in some key sectors without disturbing the price mechanism as a whole.

To sum up, within this new monetary standard, not only do the concrete labors contained in the commodities that compose the price index perform similar functions to the ones performed by gold-mining labor in the gold standard, but they do so in a manner that can be more functional to the process of capital's expanded reproduction.

This is not to say that the price-index standard has no shortcomings. For, first, the emergence of this standard reduces the number of tools the monetary authority can employ to enforce the announced rate of conversion between its liabilities and the general equivalent. In both the gold and the price-index standards, the CB attempts to sustain parity by manipulating the base rate of interest. Now, within the gold standard, the CB supplements the use of the rate of interest by building up a stock of gold that can be mobilized whenever the parity between its liabilities and the money-commodity is jeopardized (Eichengreen 2008). To be sure, such reserves tend to be outstandingly low as compared to the amount of bank deposits and CB liabilities in the economy; they do, however, provide an additional layer of protection to the parity which the CB has promised to sustain. Such additional layer of protection tends to disappear once the price-index standard arises; for, contrary to gold, the monetary authority is not able to stock all the goods and services which form the price index.[26] In other words, the passage from the gold to the of the price-index standard implies the loss of a line of defense against movements in the rate of exchange between monetary instruments issued and the general equivalent – which, in turn, may make it harder for the CB to sustain the parity between the former and the latter.

Second, and most importantly, the emergence of the price-index standard changes the ability of the capitalist mode of sociability to sustain the appearance that capitalist economic relations are a natural *datum*, and therefore cannot be transformed by conscious human action. As revealed by Marx, the social positioning of gold – a natural element –

[26] Note, however, that other state agencies can and often do stock some of these commodities in an attempt to stabilize their prices – e.g., oil in the US.

as the immediate incarnation of value serves to reinforce the 'fetishism attached to the world of commodities' (Marx 1990, 176), naturalizing the category of value and obscuring the fact that the economic relations from which this category arises are historically and socially determined. In the opposite direction, the social positioning of a price-index as general equivalent reveals the contradictions of this fetishized appearance, bringing to the fore previously hidden historical and social dimensions of the institution of money.

The constitution of a price-index standard requires, first and foremost, that a price-index be constructed. Historically, the index that has most often played the role of general equivalent is the CPI. Now, the construction of a CPI requires, on the one hand, that one defines *what* are the items whose consumption will henceforth be regarded as necessary for a decent life; and, on the other hand, that one defines the basic *quality* such items must have at any given moment in history. Are cell phones, cars and shelters basic consumption items – and, if so, what kind of cell phone, car, or shelter should an average person be able to consume? One need only pose such questions to bring to the surface a series of normative questions that inevitably historicize both the economic and the power relations on which the current mode of production rests – thus destabilizing the fetishistic notion that capitalism expresses a natural form of organization of human material reproduction.

In short, within the price-index standard, no single item can function as the immediate manifestation of value; moreover, the delimitation of the set of goods that collectively function as general equivalent has evidently not merely a natural, but also a *conventional* dimension, as it involves an array of normative issues related to what, in each historical juncture, should be regarded as a basic consumption basket. This suggests that, within the price-index standard, the capitalist form of wealth is not naturalized in the same way as within the gold standard.

In another contradictory direction, however, the institutionalization of a price-index as general equivalent may also reinforce the appearance that money is a simple means, i.e., just a neutral unit of account for the subjective comparison of individual utilities. Instead of an arbitrary commodity like gold, a more reliable and stable symbol is now presented as a neutral medium for individual utility subjectivations. Instead of gold as the natural

incarnation of value, money now arguably appears as a neutral mechanism for the natural process of subjectivation of the commodity utilities of capitalist individuals.

6 Conclusion

The paper demonstrated how both credit money and the constitution of a hierarchy of monetary instruments arise from the inner logic of the capitalist mode of production – a mode of production which forces agents to search for ever new ways of economizing on the use of cash. In doing so, the paper also demonstrated that the existence of a money-commodity is consistent with the complex structures of discounting and rediscounting in contemporary economies, and thus also that the development of a credit money system is compatible with Marx's theoretical framework – even though, in Marx's view, ultimate money must necessarily be a commodity.

The conceptual development of credit money and of a hierarchy of money instruments, however, cannot be directly traced to the actual historical development of capitalist monetary systems. Thus, the last two sections of the paper analyzed the historical constitution of capitalist monetary hierarchies, highlighting how they arose in both England and the United States. To a certain extent, this demonstration is restricted to the period pre-1971, when gold was still positioned at the pinnacle of the (international) hierarchy of monetary instruments. Therefore, the fourth section delved into recent developments of the monetary system, showing how the current monetary system – in which monetary instruments promise parity against a price index – sustains a subtle relationship between commodity money and credit money.

Within the price-index standard, the goods and services that form the index perform – *collectively* – a role that is similar to the one performed by gold within the gold-standard, i.e., that of functioning as general equivalent. Paraphrasing Marx, one could argue that the innumerable equations of which the general form of value is composed equate the labor realized in the items that compose the index with the labor contained in every ordinary commodity. In both the gold and the price-index standard, the relationship between ordinary commodities and the item(s) that function(s) as general equivalent is

not immediate, but rather mediated by instruments issued by private banks (i.e., money dealing capitals) and the central bank. Most importantly, in both standards, the equalization of the labors contained in ordinary commodities to the labor(s) contained in the item(s) that function(s) as general equivalent constitutes a necessary moment in the process of transformation of use values into values – and thus also in the reproduction of the capitalist mode of production.

Indeed, the case could be made that the price-index performs the function of general equivalent more adequately than gold – entailing that, from the perspective of Marx's conceptual framework, the price-index standard fits even better with the structural determinations of the capitalist mode of production than the late gold standard. The fact that the value of gold depends more on past than current labor implies that any monetary standard in which gold functions as the general equivalent tends to be *deflationary*. The same, of course, is not true of the price-index standard: because the vector of commodities contained in the CPI provides a more accurate representation of current social labor, the price-index standard is neither necessarily deflationary, nor necessarily inflationary. This, among other things, makes the price-index standard far more functional from the perspective of capital's expanded reproduction.

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