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Amos Pesenti

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The origin of inflation in a domestic bank-based payment system

Amos Pesenti

*Department of Economics
University of Fribourg, Switzerland*

Abstract: This paper shows how a disorderly-working bank-based payment system negatively affects monetary stability. This occurs when firms invest their profits in production with the aim of forming and accumulating (fixed) capital, while at the same time banks carry out the payment of workers' wages and enter the corresponding payment order in the architecture for domestic payments. In fact, if the payment of wages is financed with profits, this payment operation corresponds to an emission of (empty) money without it being endowed with value, to wit, purchasing power. It follows that the existing value of money is "diluted" in a greater amount of money units, so much so that the current purchasing power of each unit of money is reduced. This monetary phenomenon can be defined as inflation, which, in turn, exerts an upward pressure on the general price level. A structural reform of the bank-based payment system, as suggested in this paper, may consequently improve the defective architecture for domestic payments and thereby promote long-run monetary stability.

Keywords: Banks, deflation, inflation, money, payment systems, profits, wages.

JEL classification codes: E20, E31, E42, E51

1 Introduction

Money and banking intervene together in the functioning of every economic system in which the former, being issued via credit operations, is the purely numerical form of any payment, and the latter develops in respect of the variety of monetary and financial intermediation services. That said, a misunderstanding of the nature of money and the working of any bank-based payment system does not help to provide solutions to macroeconomic problems afflicting modern economic systems. For instance, inflation is, at the time of writing, one of the most misunderstood phenomena in economics. The reason for this is that the common perception of inflation relies only on the measurement of changes in the general price level, neglecting the money and banking analysis of any payment system. Precisely, the traditional approach to inflation generally accepts the consumer price index (CPI) as the best way to measure the overall increase in prices. It also considers that fluctuations in prices may be the result of many factors, such as the agents' forms of behaviour¹ or the distribution of income, whose interaction may influence the magnitude of inflation. Then, it argues that money's and consumers' purchasing power are two aspects of one and the same reality, assuming that both aspects are reflected in changes in the general price level. Although currently the money and banking analysis of any payment system is not taken into account in the traditional analysis of inflation, a new approach ought to be adopted for the purpose of studying inflation. This approach ought to stress the importance of the nature of money as well as its value, taking into consideration the logical working of the bank-based payment system. In so doing, it is possible to challenge the plausibility of the intuition that money and output, being two related items, may be associated at the moment when an income is paid out on the factor market, determining money's value, to wit, its purchasing power. This implies that the understanding of inflation ought to focus on the creation of money's purchasing power, which depends on the formation and the expenditure of wages and profits.

This paper takes a macroeconomic perspective in studying the formation and the expenditure of profits in a monetary economy of production and exchange, highlighting the fact that in the related disorderly-working bank-based payment system, the accumulation of capital (that is, the investment of profits in the factor market) affects money's purchasing power negatively, causing inflation. Clearly, a defective architecture for payments leads banks to issue empty money (that is, money which is not associated with output) when firms spend their profits (in the form of pre-existent bank deposits) on the accumulation of capital, while at the same time banks carry out the payment of workers' wages. By paying workers' wages, banks "recycle" firms' profits. In this payment operation, firms' profits are destroyed, but not the matching bank deposits, which reappear as new wages in banks' balance sheets. This is a sort of "duplication" of bank deposits, which can then be expended again by wage earners on the product market, even though these deposits are not endowed with purchasing power. In so doing, an extra sum of empty

¹ Economic agents are both banks and non-bank agents, such as firms, financial institutions, households (that is, workers or wage earners) and the state.

money (deriving from the duplication of bank deposits) is added to that recently associated with output. The excess of empty money represents an excess demand for goods and services available in markets that, in turn, alters the money–output relationship and thereby elicits an inflationary increase in the general price level.

Overall, section 2 reviews the debate on the nature of money and the working of the domestic bank-based payment system, emphasising the fact that money’s purchasing power derives directly from the association between money and output, which occurs when wages are paid out on the factor market. Section 3 points out that the measurement of inflation, rather than focusing only on changes in the general price level, ought to also consider the distinction between money’s and consumers’ purchasing power. In fact, inflation may remain unnoticed if upward pressures on the general level of prices are entirely measured through the CPI. Section 4 offers some considerations about the accumulation of capital, arguing that the investment of profits leads firms to form their fixed capital, whose amortisation and remuneration cause an emission of empty money. This affects money’s purchasing power negatively, leading to inflation (or deflation). Section 5 proposes a structural reform to be applied to banks’ book-keeping, which ought to be implemented in order to promote long-run monetary stability² within any country’s borders. Section 6 concludes briefly.

2 The nature and the value of money

Money and banking are both required in the functioning of every “monetary economy of production and exchange”, which must be understood as a specific sort of economic system that differs substantially from the “real exchange economy” (see Keynes, 1933/1973).³ As Bortis (2015, pp. 156–7) points out in this respect, the basic scheme picturing a monetary economy of production and exchange was

² Monetary stability is the respect of the relationship between money and output established in production. The result of this (stable) relationship is the formation of money’s value, which reflects money’s purchasing power (see below for further explanation).

³ The real exchange economy is widely supported by “mainstream” economists – known as “neoclassical” or “orthodox” economists. These “economists concentrate upon the behaviour of individuals and postulate that the economic actions of individuals are co-ordinated by an anonymous self-regulating mechanism, i.e. the market mechanism” (Bortis, 2010, p. 53). Regarding this, macroeconomics is founded on microeconomics and, as such, deals exclusively with agents’ behaviour in relation to the process of “market-clearing adjustment”. Then, just as metallists argue (see below for further explanation), mainstream economists claim that “money is a neutral medium of exchange” and firms are “mere intermediaries between the market for productive services and the market for manufactured goods” (Gnos, 2009, p. 1). Even though production remains a “mysterious process” (Bortis, 2003b, pp. 87–8), the volume of output and its distribution are determined by a *relative exchange* (that is, for instance, an exchange of labour services for goods, and vice versa) when supply and demand interplay in markets, so much so that, in the case of equilibrium, both firms and money are disregarded (see Gnos, 2009, p. 1). By way of contrast, the monetary economy of production and exchange considers firms and money as the essential elements of its own nature. As we will see below, this implies that production is an *absolute exchange*, to wit, a transaction through which produced output is replaced by a sum of money (or an income), which, in turn, becomes the object of bank deposits (see Cencini and Rossi, 2015).

sketched out by Marx (1885/1957) as a kind of chronological “circuit of money”, which can be outlined as follows: M–C...P...C’–M’, where at the beginning of the production process, money (M) takes the form of bank loans and, as such, is used by firms to pay the means of production (C).⁴ At this point, entrepreneurs must “hire workers to produce the goods [and services] that will be sold on markets. As production takes time, [firms] must pay wages now, before sales receipts are realized. Furthermore, because the future is uncertain, sales receipts are uncertain. This means that interest must be paid on liabilities [or fixed capital] and that capitalist production is only undertaken on the expectation of making profits” (Wray, 1999/2001, p. 180). In this regard, (P) stands for the (social and circular) production process, where workers, offering their labour services to firms, obtain an income, which is automatically and necessarily deposited in bank accounts. The payment of production costs therefore creates an income, which is necessary and sufficient to purchase the total amount of produced output (see Gnos, 1998/2005, p. 30; and Bailly, 2012, p. 124). Given this, at the end of the production process, wage earners dispose of bank deposits endowed with purchasing power with which they can effectively demand (M’) goods and services (C’) offered by firms, while entrepreneurs earn the respective turnover with which they can reimburse their debt to banks.

In a monetary economy of production and exchange, all monetary and financial transactions are necessarily carried out by banks through a payment system. This means that the working of the latter is absolutely dependent on money and banking. Every payment order is thus carried out by banks on behalf of non-bank agents and the corresponding accounting entry is recorded in banks’ ledgers in conformity with the principle of double-entry book-keeping. While the essence of any payment is the double-entry book-keeping principle (see Rossi, 2007, p. xii), a *bank-based payment system* is precisely defined as “a set of instruments, banking procedures and, typically, interbank funds transfer systems that ensure the circulation of money” from the bank accounts of payers to the bank accounts of the payees (CPSS, 2001/2003, p. 38).⁵ In other words, in a bank-based payment system, banks provide a set of accounting operations with the aim of recording the debt–credit relationship between agents, while banks’ balance sheets represent the architecture for payments. In this view, money is the numerical counter that characterises the “social relationship” between payers and payees (Marx, 1847/1996, p. 109, our translation) and, as such, it is used by banks to process payment orders as soon as these are entered in the architecture for payments. This implies that “[m]oney and payments are one and the same thing. No money, if correctly defined, exists either before or after a given payment” (Schmitt, 1996/2005, p. 83). Hence, if the execution of payment orders by banks is an instantaneous operation, its result is the formation of

⁴ From a macroeconomic perspective, the means of production are merely represented by labour services. So, the payment of wages is assumed to be the sole mechanism that allows the remuneration of the unique factor of production (or production cost) called labour, whose unit of measure is the wage unit (see Keynes, 1936/2007, p. 41; pp. 213–4).

⁵ The domestic bank-based payment system is completed by a *settlement system*, to wit, “a system used to facilitate the settlement of transfers of funds or financial instruments” such as, for instance, bonds, equities and derivatives (CPSS, 2001/2003, p. 46).

a bank deposit labelled in money units, which numerically “quantifies” the magnitude of the debt–credit relationship among agents.

Money is exclusively emitted in each country by the national banking system, which is made up of a central bank and commercial banks (see Rossi, 2003, p. 2).⁶ Being of banking origin, money can solely be deposited within banks (see Cencini, 1995/1997, p. 22). Moreover, as (modern) money is recorded in the double-entry book-keeping of banks, its nature is essentially numerical: it consists of electronic impulses (ibid., p. 28). Given this, money is in itself worthless, because numbers have no value (ibid., p. 28). As Schmitt (1966/1975; 1975/1993; 1984) points out in this respect, money does however acquire value when it is associated with the output resulting from production, which is monetised by banks at the very instant when factor costs are paid. But, the theoretical foundation of Schmitt’s analysis, which led to the emergence of the approach known as the “theory of money emissions” (see Rossi, 2006) or “quantum macroeconomics” (see Cencini, 2015b), differs substantially from two main schools of thought about the nature of money, which, quoting Schumpeter (1954/2006) and Goodhart (2003), have historically characterised the theoretical framework from the past to the present day: chartalism and metallism. Let us explain both theories briefly.

Chartalism defines money as “a creature of the state”, whose essence is a unit of account for debt contracts and a *means of payment* (see Knapp, 1905/1924; Bell and Nell, 2003; and Rossi, 2007). To be exact, the nature of money is legally determined by what the government generally accepts as legal tender for the payment of taxes and other debt obligations (see Knapp, 1905/1924; Keynes, 1930/2011; Lerner, 1947; and Rossi, 2007). As time goes by, this sort of governmental consensus is usually accepted as an imposed but social tacit agreement. In so doing, the state, setting up a legal order, determines the value of money (that is, its purchasing power). This means that money’s value is “based on the power of the issuing authority, and not by any embodied or backing precious metal” (Wray, 2003, p. 92). By way of contrast, metallism considers money as “a creature of the market”, whose essence is influenced by the behaviour of agents when the latter express their utilities, preferences and choices against the goods and services exchanged on markets (see Bell and Nell, 2003; and Rossi, 2007). In the process of exchange, money is generated with the aim of facilitating the coincidence of wants and then reducing transaction costs (see Jevons, 1875; von Mises, 1912/2009; and Bell and Nell, 2003). This also means that money is a *medium of exchange*, to wit, a producible commodity, which, contrary to any other commodity, has the special feature of being reified into a precious metal, endowing money with value or purchasing power (see Jevons, 1875; and Wray, 2003).

Both chartalism and metallism, however, suffer from a fundamental problem regarding the determination of money’s value. Indeed, money neither defined as a

⁶ In this paper, banks are considered to be a set of single commercial banks representing the aggregate banking system. Central banks are not “integrated” into our definition of banks (see Rossi, 2007, pp. 64–88 for analytical elaboration on this point).

commodity reified into a precious metal, nor considered as a by-product of a legal order may represent a kind of “social form of value” (see Marx, 1939/1973, p. 145). This is so because both schools of monetary thinking consider the value of money as “not invariable”. In fact, the value of money depends on a standard of value, that is to say, on something, such as a set of laws or gold and silver, used as a standard reference or a standard basis, which is perceived as the major source of value for money. For instance, chartalists recognise that money’s value is *subjectively* determined by a legal order as soon as a debt relationship (in payment of taxes) occurs between the tax-paying population and the government. Once money is created by the state, it is then used as an intermediary asset in the process of exchanging all sorts of fiscal obligations for privately produced outputs (see Rossi, 2007, p. 19). If so, money, instead of being a means of payment, must be considered as a medium of exchange, namely, an object of trade that the tax-paying population generally accepts in exchange for (pre-existent) goods and services previously generated in the private sector. By way of contrast, metallists advocate that money’s value does not only depend on agents’ decisions to use it as a means to settle debts, but also derives *objectively* from the intrinsic value of the precious metal embodied in the commodity used as a medium of exchange. Thus, if money is associated with a precious metal, the value of the latter “is subject to variation for a number of reasons [...], which cannot make sure that a commodity like gold has invariable value, independently of the time horizon considered” (ibid., p. 13).

It is thus clear that the determination of money’s value by chartalism and metallism is ambiguous. This is due to the fact that if money’s value depends on a standard of value, it would never be possible to measure the appreciation (or the depreciation) of money as well as determine if this phenomenon is due to a change in its value or a variation in the standard itself (see Ricardo, 1823/1951, pp. 399–400; and Cencini, 1995/1997, p. 127). Yet, advocating that another perspective on the nature of money emerges from a sort of synthesis between chartalism and metallism, we argue that money is a non-commodity with a legal-tender status that should be interpreted as a numerical counter without value, “because otherwise it would itself need to be measured using another standard of value, in which case infinite recursivity makes this measurement logically” questionable (Rossi, 2007, p. 13).

As clearly shown by the theory of money emissions, the existence and the origin of (modern) money are to be found in the bank-based payment system in which banks, acting as go-betweens for non-bank agents, develop in respect of the variety of monetary and financial transactions. Precisely, banks have “been created for the sole purpose of settling debts between agents” through the implementation of a double-entry book-keeping system (Rochon and Rossi, 2013, p. 218). Banks are therefore essential, because they act as the provider of money, to wit, “a purely numerical form, which does not pertain to the set of real goods, services and assets, [but can be used as] a means of final payment in a monetary economy of production and exchange in which output is measured and circulated via the use of what is essentially a bank’s double entry in its own books” (Rossi, 2007, pp. 3–4). Being the numerical form of any payment, money is thus “an asset and a liability equally, in other words, an asset-liability” to be recorded in banks’ ledgers (Schmitt,

1975/1993, p. 7, our translation). That said, money is therefore “a creature of banks” (Rochon and Vernengo, 2003, p. 61), whose value depends on the association of money with output that occurs on the factor market when wages are paid out in conformity with the double-entry book-keeping principle – as we will see below. Of course, *when wages are paid out on the labour market, money assumes the non-empty numerical form into which output is integrated* (see Schmitt, 1996/2005, p. 80), giving rise to bank deposits endowed with value, to wit, purchasing power.

By creating money, banks “issue new debts upon themselves which they lend to non-bank agents. Since these debts are money, the latter appears as an increase in banks’ liabilities which is equivalent to the newly-held deposits of the non-bank public. Logically accounted for as an equivalent increase in bank assets, the counterpart of this newly-created money is the forward debt of non-bank agents in the form of loans to be paid back at some definite date in the future” (Parguez and Seccareccia, 2000/2002, p. 104). If so, the “loans-make-deposits” causality is more logical than the common belief that “pre-existent deposits make loans” (see Schumpeter, 1954/2006, pp. 1076–83; Graziani, 2003, pp. 82–4; and Jakab and Kumhof, 2015, pp. 9–13). Notably, the idea that “deposits make loans” is adopted by mainstream economists and is rooted in the “loanable funds theory”. Generally speaking, this theory supposes that savings (that is, pre-existent bank deposits) lead to the supply of loans, which are then invested by firms somewhere (see Bertocco, 2013; and Lindner, 2013). In accordance with this approach, banks are mere financial intermediaries placed between savers and investors (see Leijonhufvud, 1979, p. 25).

Now, adopting the revolutionary Keynes’s (1973, p. 91) approach, banks are not only financial intermediaries, but also money and credit purveyors, that is to say, they are both *monetary and financial intermediaries*. More precisely, when banks act as monetary intermediaries, the principal way by which bank deposits are created is through commercial banks making loans: whenever banks make loans, they simultaneously generate deposits in borrowers’ bank accounts, thereby creating new money (see McLeay et al., 2014, p. 14). Once money has been created through lending, it “circulates between agents, who accept it as a means of payment on the basis of its purchasing power” (Rossi, 2001b, p. 2). Then, “non-bank agents spend the money that they have borrowed to acquire real resources, which are generally labour and produced commodities. Sellers of labour services or commodities acquire the quantity of money [in the form of bank deposits] which was [previously created by banks]. In the balance sheets of banks, there appears a mere transfer of deposits or liabilities from [...] the sellers of commodities and labour services” (Parguez and Seccareccia, 2000/2002, p. 104). In the meantime, banks can dispose of (the saved part of) these deposits and, in conformity with the deposits-to-loans causality, lend them to other non-bank agents without banks’ depositors or borrowers necessarily being aware of this financial intermediation (see Gnos, 1998/2005, p. 34). But, when banks’ depositors spend the total amount of bank deposits at their disposal, “the initial holders of bank debts recover them [...] out of their receipts generated by their initial expenditures. They can now replenish their deposits and pay back their loans” to banks (Parguez and Seccareccia, 2000/2002, p. 104), destroying the

equivalent deposits available for financial intermediations. In this case, banks, before granting other loans based on pre-existent deposits, must wait for another monetary circuit to start, generating new bank deposits.⁷

This kind of “dynamic flux and reflux process is the essence of the monetary circuit. Its different phases are directly mirrored in banks’ balance sheets” (Parguez and Seccareccia, 2000/2002, p. 104) and thereby prove that money is not a net asset: it is an object of mediation and not a result of production (see Schmitt, 1988, p. 173). In particular, if money is considered to be a means of payment, namely, the form in which every payment is carried out on the labour market, the object of “payment is not money as such, but output in the form of a bank deposit” (or an income) (Rossi, 2001b, p. 7). By way of contrast, if money is traded as a net asset, it is only used as a medium of exchange, which splits the “exchange relationship” into two transactions: a sale and a purchase (see Cencini, 2005, p. 286). Hence, every exchange relationship in whatever marketplace turns into a barter trade, where money is considered to be a medium of exchange, to wit, “an object which is taken in exchange, not on its own account, [to wit,] not to be consumed by the receiver or to be employed in technical production, but to be exchanged for something else within a longer or shorter period of time” (Wicksell, 1906/1978, p. 15).

What is crucial now is to “avoid confusing the *means* with the *object* of payments” (Cencini, 2005, p. 308, emphasis in the original). In fact, the challenge of studying the very nature of money is to distinguish money (corresponding to a numerical counter) from income (representing a claim on bank deposits). As Smith’s attempt shows well, the emission of money must not be *de facto* confused with the creation of income (see Smith, 1776/1993, pp. 171–90). Indeed, money as a means of payment is not an object itself, but an “instrument” for the measurement and the circulation of the objects exchanged on markets, while the object of payment is the produced output financially deposited with banks (see Cencini, 2001/2014, p. 70), namely, an income in the form of bank deposits. Hence, money as a means of payment is a “great wheel” and, as such, is limited to the measurement and the circulation of income that is formed in production when production costs (that is, labour services) are paid out by banks on behalf of firms on the factor market (see Smith, 1776/1993, pp. 171–90; and Cencini, 1995/1997, p. 21). This means that income as an object of payment is necessarily generated when production is monetised by banks and not via an intervention *ex nihilo* of the latter (see Cencini, 1995/1997, p. 21).

Banks monetise production when firms need credit as “initial finance [in order for them to] cover the total cost of the planned amount of production” (Graziani, 2003,

⁷ Banks can, however, exploit the loans-to-deposits causality in order for them to increase the volume of deposits without entertaining a relationship with the production process. If banks “move forward in step” on the interbank market (Keynes, 1930/2011, p. 26), their lending capacity has no limit, because banks do not have interbank debts to settle and thereby do not require settlement balances at central banks. In this way, banks can obtain reciprocal credit lines on the interbank market in order for them to increase their business, offering purely “speculative” financial intermediation services (see Rossi, 2010, 2011; for analytical elaboration on this point).

p. 69). Logically, bank loans are used by firms to pay labour services in production. This implies that workers are credited with a number of money units, which is instantaneously allocated in bank deposits. If so, production generates a debt–credit relationship between firms and their workers via banks’ intermediation. Through the monetisation of production, any money emission associated with a payment order is obviously itself a *flow*, to wit, an instantaneous event, whose object is a *stock* of income (or capital) in the form of bank deposits (see Cencini, 2001/2014, p. 3; and Rossi, 2007, p. 34). Banks therefore create “the flow but not its object, which is closely related to production” (Cencini, 2001/2014, p. 3). “Unlike money, however, income, which exists in the form of bank deposits, has a positive duration in chronological time, and notably exists as financial capital” or *capital-time* (Rossi, 2007, p. 39).⁸

Table 1 The result of the payment of workers’ wages from bank loans

Banks			
Assets		Liabilities	
(1) Firms	+x m.u.	Workers	+x m.u.
_____		_____	
_____		_____	

Source: Author’s elaboration based on Cencini and Rossi (2015)

The two accounting entries illustrated in Table 1 represent the payment of wages by banks on behalf of firms and to the benefit of workers. Precisely, by investing bank loans in production, firms pay the wages of workers (entry (1)). This implies that a number (x) of money units (m.u.) appears on each side of banks’ T-accounts automatically and simultaneously (see Schmitt, 1975/1993, pp. 8–13). In fact, the double-entry book-keeping principle shows that every “payment between two customers can be accomplished by simply transferring the appropriate sum of money *in the books of the bank*. It can be written off the account of the debtor (the buyer) and credited to the account of the creditor (the seller)” (Wicksell, 1898/1962, p. 68, emphasis in the original). Accordingly, money as an asset-liability numerically measures, in economic terms, the amount of firms’ debt on the assets side and the amount of workers’ credit on the liabilities side of banks’ ledgers (entry (1)). This bank-based payment system “is developed up to the point where everybody possesses a banking account [so that] all payments could be effected by such book-keeping transfers” (ibid., p. 68).

The payment of wages is an emission that allows workers to get their own produced output in money (see Schmitt, 1984, p. 347). In other words, it is the (banking) operation “allowing for the social definition of labour and for the replacement of physical output by money” (Cencini, 2001/2014, p. 16). If, on the one hand, money

⁸ In accordance with Schmitt (1984), capital-time is an income saved during the period over which it is transformed into financial capital. Successively, this sort of capital can be transformed back into income in order to be consumed on the product market.

is the direct product of labour, on the other hand, labour produces exchange value that, in turn, corresponds to wages (see Marx, 1939/1973, p. 224). In this vein, “[w]ages are the social definition of labour, and are themselves expressed numerically in money terms. Hence, money defines [produced output] through wages” (Cencini, 2001/2014, p. 16). By defining output through wages, the final holders of output (that is, workers) are also the holders of wages, which are automatically and necessarily deposited in bank accounts. Now, *what workers obtain from firms is not just bank deposits, but a drawing right over output, that is to say, a purchasing power defining the value of their own produced output* (see Cencini, 1995/1997, pp. 22–3). This is so because “money’s value, to wit, its purchasing power is defined by those goods and services with which money is identified” (Cencini and Rossi, 2015, p. 27). Given this, money acquires purchasing power if, and only if, it is associated with produced output on the factor market when wages are paid out by firms to workers with the intermediation of banks (see Rossi, 2001a, p. 124).

Workers’ wages are thus the result of the payment carried by banks on behalf of firms, and it is because of production that the former are endowed with purchasing power (see Cencini, 2001/2014, p. 66). In fact, as soon as money is associated with output, the former acquires a real content and the latter gains a monetary form simultaneously (see Cencini, 1995/1997, p. 15). The real content then defines the value of money, which, in Schmitt’s (1984, p. 347) sense, is included into money via an *absolute exchange*: workers obtain a sum of money that, given its emission in the payment of wages, is made identical to the output produced by the same workers. This is tantamount to saying that production is (not a relative, but) an absolute exchange, namely, a transaction through which output is replaced by a sum of money (or an income), which, in turn, becomes the object of bank deposits (see Cencini and Rossi, 2015, p. 26). At this point, bank deposits do not correspond to a sum of *empty* money, but a sum of *full* money, which defines the output transformed temporally into wages. Yet, bank deposits labelled in money units have value and thereby confer on their holders purchasing power. To be sure, bank deposits define the power of wage earners to buy the output that is stored by firms waiting for the final sale on the goods and services market (see Cencini, 2001/2014, p. 143). The holders of bank deposits thus have purchasing power as long as they do not “channel” their deposits into the financial market and/or the product market (see Rossi, 2007, pp. 32–63). If this is the case, the content of bank deposits is transformed into the form of financial assets, such as bonds or securities, to be transferred on the financial market and/or in the form of physical value-in-use, such as goods and services, to be consumed on the product market (*ibid.*, pp. 32–63).

We conclude immediately that the purchasing power of money is not originated in the banking system, as no bank creates value with a simple writing of a number in its ledger (see Rossi, 2003, p. 2). Then, money’s purchasing power neither finds its origin in the embodied value of some precious metals, nor stems from a governmental legal order. Although the purchasing power of money depends on its association with output, the arguments about the value formation of both chartalism and metallism can be rejected. Moreover, if the nature of money is strictly related to

the double-entry book-keeping principle, money's value is "vulnerable" to whatever structural change occurs at the level of the bank-based payment system only. To clarify, the value of money may be influenced by the manner in which banks record payment orders in their ledgers. For instance, a disorder in the way in which payments are carried out by banks on behalf of firms emerges in the process of capital accumulation. This causes a variation in money's purchasing power, leading to inflation. As we will see in the next section, inflation causes a rise in the general price level. Contrary to the view propounded by mainstream economists, inflation may also remain unnoticed if pressures on the general level of prices are entirely measured through the CPI.

3 Distinction between money's and consumers' purchasing power

Adopting a macroeconomic perspective, we cannot investigate the nature of money and the functioning of the bank-based payment system without considering the fundamental questions about inflation and its measurement. As mainstream economists and the general public have all commonly started to claim, inflation reflects an overall increase in prices (or a decrease in the value of money), which is estimated on the basis of changes in a (domestic) CPI (see SNB, 2002/2006; ILO et al., 2004; and UNECE et al., 2009). In fact, the CPI is measured as a weighted average of the proportionate, or percentage, price changes for a representative basket of traded goods and services on markets: when the measured price level of the specified goods and services increases, the purchasing power (of money or) of consumers (that is, the amount of income that people spend in order for them to maintain their standard of living) decreases, and vice versa (see ILO et al., 2004; and UNECE et al., 2009). According to this view, the price index is thus used as a traditional measure for inflation and, as such, represents the mirror image of changes in the cost of living of consumers who purchase the content of the basket of goods and services. As a result, money's purchasing power is decreased (or increased) when inflationary (or deflationary) pressures are at work.

The measurement of inflation through the CPI suffers, however, from some analytical weaknesses. Broadly speaking, if a typical CPI is intended to measure the rate of price inflation as perceived by representative consumers, a statistical agency must determine what consumers buy with their income before constructing this index (see Cecchetti, 2009, p. 4). Moreover, the estimation of the CPI is subject to a number of measurement biases, whose origin is to be found in the method of data manipulation and estimation techniques. Of course, "bias arises because of the way the raw data that go into the index are collected, how they are weighted together and combined into a single index or how the statistical agency gathering the data tries to deal with improvements and deteriorations in the quality of the goods being priced" (ibid., p. 4).

In agreement with the theory of money emissions, the traditional measurement of inflation not only provides a "sketchy" evolution of consumers' purchasing power, but also represents a wrong indicator for the increases (or decreases) in money's

purchasing power. This is due to the fact that, fundamentally, an apparent differentiation between money's and consumers' purchasing power has not been incorporated in the (general price) estimation method (see Cencini, 1995/1997, pp. 51–2; and Rossi, 2011). In simple terms, it is necessary to “distinguish inflation from a rise in the cost of living” (Cencini, 2015a, p. 249): while the former reflects a loss in money's purchasing power⁹, which exerts an upward pressure on the general price level, the latter indicates changes in the amount of income that consumers need to spend in order for them to maintain their standard of living. Given this, money's purchasing power derives exclusively from the money–output relationship. By contrast, consumers' purchasing power is affected by technological progress and/or some policies, such as government tax policies or the mark-up policies of firms (see Cencini, 1996/2005, pp. 22–3; and Rossi, 2007, pp. 117–25; 2011; 2015). Indeed, technological progress, government tax policies or the mark-up policies of firms influence the *income distribution* among agents, but the evolution of the latter remains independent of inflation (see Rossi, 2011).¹⁰

The decision of firms to increase the mark-up on the price of their selling products, for instance, elicits an overall increase in prices and probably also in the CPI (ibid.). Nonetheless, an increase in the price index is not inflationary per se, as the relationship between money and output remains unaffected. The only observable pressure is represented by the fact that after the decision of firms to increase their mark-up, the distribution of income between firms and wage earners is modified, leading to a rise in the cost of living of people (ibid.). This means that wage earners lose a part of their purchasing power, even when the stability of money's purchasing power prevails. In practice, firms get an extra part of consumers' income (that is, a part of bank deposits equivalent to the increased profit margins) that consumers spend to buy the products offered by firms (whose prices are greater than before the rise in mark-up). A share of income is therefore transferred from workers to firms on the product market. Thus, firms now dispose of an additional part of the bank deposits (that correspond to profits), which was hitherto at the disposal of wage earners to buy the total amount of produced output.

Contrary to what is indicated by the CPI, inflationary pressures on the general price level could also be observed over a prolonged period of stability of the price index (ibid.). To put it bluntly, when firms do not raise the mark-up, but at the same time technological progress allows for a reduction of unitary production costs, a decrease in the prices of produced output should be observed (ibid.). In this case, if the price level does not decrease and the CPI remains stable over time, this can be attributed to a decrease in money's purchasing power (ibid.). A loss in the purchasing power of money generates an upward pressure on the general price level and thereby counterbalances the diminution of prices due to technological progress. Another interesting case is represented by the situation where the CPI indicates a decrease in

⁹ It is important to note that it is the loss (or gain) in money's purchasing power that exerts an upward (downward) pressure on the general price level, and not vice versa – as all economics textbooks describe.

¹⁰ See Rossi (2001a, pp. 131–45) for an analytical review of the topics related to the neutrality of agents' behaviour in the money–output relationship.

the general level of prices (ibid.). Yet, the general decline in prices may be lower because inflationary pressures could appear and persist (ibid.). In fact, if there is eventually an alteration in the money–output relationship, inflation exerts an upward pressure on the prices of goods and services on sale, so that the decrease in prices is lower than would have occurred if inflation had not been at work (ibid.).

By considering the previous two cases, we confirm that inflation cannot be fully captured by the CPI. This is so because inflation is not defined as an overall increase in prices. As we have noted before, inflation reflects a loss in money’s purchasing power and, as such, is the cause of the increase in the general level of prices. Yet, although inflation is a result of an “economic disorder” that still remains a mysterious phenomenon, let us sketch out the theoretical foundation upon which this paper builds a coherent discussion about the origin of inflation. As pointed out by Schmitt (1984), inflation is directly linked to the process of capital accumulation and it reappears when the fixed capital of firms needs to be amortised. From a monetary-circuit point of view, capital accumulation coincides with the formation of fixed capital, which is generated through the investment of profits. Profits are thus the components of fixed capital, that is to say, “the capital which, definitively lost for income holders, defines the property of [...] firms” (Cencini, 1995/1997, p. 89). To be rigorous, profits are extracted from income and thereby do not represent an extra surplus added to it (that is, they do not derive from the marginal product of capital): profits are logically the product of firms’ mark-up policies, namely, the result of the mark-up of prices over factor costs.

In this respect, Keynes (1930/2011, p. 123) and Bortis (1997/2006; 2003a; 2013) note correctly that (desired) profits represent the difference between the costs of production and the prices of the goods and services available in the product market. These “(absolute) prices (of production) are based on the normal cost and price calculation of enterprises and are, as such, known *before* commodities [or services] appear on the market, and subsequently underlie the market process” (Bortis 2013, p. 341, italics in the original).¹¹ Profits thus derive directly from the price calculation of firms and are captured by them on the goods and services market when wage earners spend their *nominal wages* (or income). Yet, it is important to observe that even if workers have gained nominal wages on the labour market, they dispose of only the *real* part of them. In fact, the imposition of profit margins by firms on the product market deprives workers of a part of their nominal wages required to buy the total amount of produced output at any price level (see Bailly, 2012, p. 126). This means that the sum of real wages that workers ultimately enjoy is lower than the sum of nominal wages shared out by firms: *real wages are equal to nominal wages less the profits formed in the sale of produced output* (ibid., p. 126).

Further, considering the fact that “[t]he value is the equivalence between output and income [,] prices include transfers of this equivalence: so firms’ profits are made up

¹¹ The absolute price emerges from the normal cost calculation carried out within firms and is determined before the corresponding good (or service) appears on markets, while the relative price of each good (or service) is defined in terms of other goods (or services) during the act of exchange in the marketplace (see Walras, 1874/2014; 1898/1936).

of money, whose correspondence with output has not yet been exploited or ‘expended’” (Schmitt, 1975/1993, p. 63, our translation). Consequently, by marking up prices on the market for goods and services, “profits are transferred from the pockets of the general public into the pockets of the entrepreneurs” (Gnos, 1998/2005, p. 32). The part of the income that workers have lost by buying products on markets is transferred to firms, giving them the purchasing power to acquire the produced output that workers cannot buy. This modifies the distribution of income between workers and firms. Consequently, *consumers lose in terms of purchasing power, even when money’s purchasing power remains stable over time*. At this point, if firms decide to redistribute their profits to their “share or equity holders, or even to the general government sector in payment of taxes” (Rossi, 2001a, p. 150), consumers regain the necessary power to purchase the consumption goods and services, which have not yet been consumed previously. In so doing, the total amount of produced output is entirely consumed, so that the Keynes’s identity between total supply and total demand is respected, as no stock of output remains unsold. This way of reasoning gives rise to the aphorism attributed to Kalecki, but which can be found in Kaldor (1955–1956, p. 96), according to which “capitalists earn what they spend, and workers spend what they earn”. In other words, although total demand is the reflux of the income formed by total supply, total demand and total supply are both the equal terms of the same macroeconomic identity (see Schmitt, 2012, pp. 82–6).

As we have demonstrated logically, inflation is not necessarily captured by the CPI. This is due to the fact that the CPI makes no distinction between money’s and consumers’ purchasing power. Indeed, the general price level may vary when firms decide to increase their profit margins. This weakens consumers’ purchasing power, but does not provoke a variation in money’s purchasing power. As we will show in the next section, the origin of inflation is only structural in nature, as it stems from the malfunctioning related to banks’ book-keeping. Especially, inflation is directly linked to the process of capital accumulation when firms invest their profits in production in order for them to form fixed capital, while at the same time banks carry out the payment of workers’ wages and enter the corresponding payment order in the architecture for domestic payments.

4 Accumulation of capital as a cause of inflation and deflation

Inflation (or deflation) reflects a loss (or gain) in money’s purchasing power, which exerts an upward (downward) pressure on the general price level. Clearly, inflation is directly linked to the process of capital accumulation when firms spend (a part of) their profits on the production of new investment goods, while at the same time banks carry out the payment of workers’ wages and record the matching payment order in the architecture for domestic payments. As neatly explained by Cencini (1995/1997, p. 92), “the investment of profit leads to the formation of fixed capital, whose amortisation causes an emission of empty money (inflation) and whose remuneration, beyond a certain level of over-accumulation, entails an over-production of consumption goods [and services] (deflation)”. The origin of inflation

(or deflation) is therefore to be found in the lack of consistency between the architecture for domestic payments and the logical laws of monetary economies (see Cencini and Rossi, 2015, p. 180). Let us explain the origin of inflation and deflation.

The main characteristic of profits is their ability to be (re-)generated by their investment in the factor market with the aim of accumulating fixed capital in the form of capital goods. This is also confirmed by Keynes, who claims that “profits, as a source of capital increment for entrepreneurs, are a widow’s cruse which remains undepleted however much of them may be devoted to riotous living” (Keynes, 1930/2011, p. 139). Through this metaphor, Keynes specifies that the formation of profits is logically referred to any expenditure of income that at the beginning of the production process is not itself a profit – as it is originally a part of nominal wages. Once profits are formed through firms’ mark-up policies, they “provide a source of [firms’] own funds for investment” (Bortis, 2003a, p. 425): profits may be invested, for instance, in the labour market for the production of investment goods (that is, capital goods) and thereby become a source of other profits.

By investing profits in the factor market, instead of being redistributed as interests and dividends (and then being spent on the product market), firms acquire new investment goods (see Cencini and Rossi, 2015, p. 172): “these goods never enter the set of saleable output, as they are produced and consumed, in economic though not in physical terms, at one and the same point of time” (Rossi, 2008, p. 221). In this case, even if the payment of workers’ wages is carried out by banks, these new wages are financed with *pre-existent bank deposits* (that is, profits). To be exact, these deposits are represented by a pre-existent sum of money, whose real content (that is, its purchasing power) has already been formed in another production process when banks associated (via the payment of wages) money with physical output. In essence, these bank deposits still coincide with the part of products that has not yet been consumed by wage earners.

Table 2 The result of the investment of profits in the factor market

Banks		
Assets		Liabilities
(1)	Firms	– x m.u.
	Workers	+ x m.u.

Source: Author’s elaboration based on Rossi (2007)

The payment of workers’ wages through pre-existent bank deposits allows firms to become the owners of the capital goods produced via the investment of profits (see Rossi, 2001a, pp. 162–3). This is so because firms do not need new bank loans to finance this sort of production: firms produce new outputs, getting them free of debt (see Gnos, 2012, p. 184). As a result, the banks’ book-keeping records the entry (1) shown in Table 2, assuming that *banks are useful only for the transfer of pre-*

*existent deposits between agents without issuing a number of money units equivalent to new bank loans.*¹² To clarify, banks transfer to workers the claim on bank deposits that firms surrender on the factor market with the aim of transforming this claim into new investment goods (see Rossi, 2007, p. 124). From this banking operation, workers just obtain bank deposits, but not a drawing right over their own produced output. Precisely, workers “perceive for their work [...] *purely nominal* [wages] which, from the moment they are handed out by firms, are completely empty of all purchasing power, that is, devoid of any output. The way by which the wage units [...] shared out by firms [...] are ‘emptied’ of their purchasing power is absolutely clear: the set of all enterprises [...] automatically comes, *at a zero cost*, into the possession of the net output [...] by virtue of the fact that the set of all factors of production derives no positive amount of *real* remunerations” (Schmitt, 1996/2005, p. 96, italics in the original). The reason is obvious. The investment of pre-existent bank deposits in production does not generate (new) “real” value. Put simply, the national economy provides only once (and not twice) the necessary and sufficient power to purchase the total amount of produced output (see Schmitt, 1984, p. 238).

By paying wages out of pre-existent bank deposits, firms therefore purchase labour services themselves (see Cencini and Rossi, 2015, p. 173). Indeed, by buying labour services, firms buy, at the same time, the product of the activity of workers (see Schmitt, 1984, p. 204). As the purchase of labour services defines the purchase of output, the investment of profits in the factor market deprives workers’ wages of their real content – as produced output is already appropriated by firms (see Cencini and Rossi, 2015, p. 173). *This appropriation of capital goods by firms disassociates output from money*, so much so that it leaves wages unaltered, but decreases their real content, reducing their purchasing power (see Schmitt, 1984, p. 208). The amount of money issued by banks in the payment of wages is thus no longer defined by those goods and services with which it is identified, losing its value, to wit, its purchasing power. Given this, when firms pay nominal wages out of pre-existent bank deposits, the former produce, appropriate and accumulate capital goods, which are outside the purchasing power of workers’ wages (see Gnos, 2012, p. 184).

Capital accumulation elicits a *duplication* of bank deposits (see Baranzini and Cencini, 2001, p. xvi), as “invested profits are *expended* instead of being *transformed* into fixed capital: despite having been spent by firms, the deposits corresponding to invested profits reappear in the payment of wages” (Rossi, 2008, p. 215, italics in the original). Indeed, firms’ profits are destroyed, but not the equivalent bank deposits, which reappear in the form of new workers’ wages on the liability side of banks’ balance sheets (see Rossi, 2007, p. 124). This implies that “invested profits are not withdrawn from circulation, but transferred in the banks’ books, namely, from the firm to the wage earner who is paid thereby” (Rossi, 2008, p. 223). So, when profits are recycled in the monetisation of other production processes, they reappear again in banks’ balance sheets “in the form of wages and

¹² It is important to observe that the transfer of pre-existent bank deposits among agents corresponds to a payment operation through which a sum of money is emitted without being related to the formation of a new bank debt in the form of a new bank loan.

define [new bank deposits] immediately available on the financial market. This sort of duplication is the sign of an anomaly that inevitably leads to” a chaotic working of the bank-based payment system (Cencini, 2001/2014, p. 5).

A disorderly-working bank-based payment system leads banks to issue empty money, which is not associated with output. Of course, this is so because the bank deposits, matching to profits, instead of being spent by firms only once on the factor market, are recycled and expended twice by workers on the product market, even though these deposits are void of any substance, namely, they are not endowed with purchasing power. In so doing, an extra sum of empty money (deriving from the duplication of bank deposits) is added to that recently associated with output. The excess of empty money represents an excess demand for goods and services available in markets that, in turn, alters the relationship between money and output.

Now, Schmitt’s (1984, pp. 189–91) contribution is seminal in showing that the emission of empty money gives rise to an inflationary gap, as total demand is greater than total supply on the goods and services market. To be exact, inflation occurs when the same output is diluted by a greater stream of money units that alters the money–output relationship (see Cencini, 2015a, p. 250), generating a loss in money’s purchasing power.¹³ If this occurs, inflation exerts an upward pressure on the general price level. Nonetheless, the logic of the monetary circuit reminds us that the inflationary gap does not appear every time a stock of unsold output remains available in the product market as soon as firms’ profits have been generated by the mark-up mechanism (see Rossi, 2008, p. 222). In fact, the number of the “money units issued in the investment of profits ultimately find[s] a ‘body’, that is, the [produced output] saved within the process by which monetary profit is formed” (Schmitt, 1984, p. 190, our translation). Devoid of the power to purchase the new investment goods, wage earners have indeed the necessary and sufficient power to buy the remaining stock of unsold output, which has not yet been consumed on the consumption goods and services market when profits have been formed (see Rossi, 2001a, p. 163).

As briefly mentioned above, inflation, which results from the investment of profits in the production of capital goods, reappears when the same investment goods (in the form of fixed capital) are amortised. The analysis of amortisation is largely analogous to that applied to fixed-capital formation, as the process of amortisation requires the investment of profits in the factor market. In particular, amortisation identifies with the production of capital (amortisation) goods, which are appropriated and accumulated by firms from the instant of their production. Logically, firms produce amortisation goods in order for them to maintain the integrity of their fixed capital, which is steadily subject to wear and tear and obsolescence (see Keynes, 1936/2007, pp. 66–73). This implies that “the amortisation of fixed capital does not amount to simply reproducing capital goods

¹³ The purchasing power of every single unit of money is thus reduced, as the existing value of money is diluted in a greater amount of money units (see Rossi, 2007, pp. 124–5), so much so that a greater quantity of money is now needed to buy the same product (see Cencini, 1995/1997, p. 59).

[...], but generates a surplus equivalent to depreciation taken into account, to wit, [capital] goods which are added to [fixed] capital” with the aim of keeping its full value (Schmitt, 1984, p. 222, our translation).

Given the “riotous living” of profits, when workers spend their wages formed in the production of investment goods, firms earn profits, which, in turn, are invested in the production of amortisation goods. By investing profits in the labour market, firms acquire new capital (amortisation) goods and replace the old ones. The payment of wages deriving from this production process generates a debt–credit relationship between firms and their workers via banks’ intermediation. However, the payment of production costs is financed with *pre-existent bank deposits*. Consequently, when the bank deposits corresponding to invested profits are recycled in the production of amortisation goods, the former reappear in the payment of wages, enhancing a duplication of these deposits in banks’ T-accounts. This kind of duplication of bank deposits corresponds to an emission of (empty) money without it being endowed with purchasing power. Consequently, the sum of deposits recorded in banks’ ledgers exceeds the amount of physical output available in markets. Now, “by contrast to empty money elicited by [the production of purely capital goods], empty money obtained from the production of amortisement goods results in a sum of money units whose emptiness is not compensated at all; this time, no pre-existent [produced output is] waiting to fill up the gap” (Schmitt, 1984, p. 223, our translation). “Since [...] no stock of consumption goods [and services] is available to fill up the wages distributed to workers producing the new amount of fixed capital goods, the rise in demand caused by the new investment of profits can no longer be neutralized” (Cencini, 2005, p. 168). This elicits a dangerous inflationary gap, as excess demand cannot be absorbed by consumers on the product market.

Having explained the origin of inflation, we focus now on the second case concerning deflation, which is caused by the remuneration of the fixed capital accumulated by firms (see Schmitt, 1984). As we have already observed, the process of capital accumulation starts when firms decide to invest profits for the production of investment goods in order for them to form their fixed capital, which, being subject to a temporal deterioration, must subsequently be amortised. Yet, once fixed capital has been formed and amortised, it “has to be remunerated” (Cencini, 1995/1997, p. 89). “Whereas amortization is the simple replacement of an old value with a new one, interest is a net income whose origin is related to the fact that [the] production of fixed capital goods absorbs a net amount of saving. It is precisely this increase in the demand for saving that is the cause of interest. The transformation of saving into a macroeconomic capital [called macroeconomic saving] defines the final loss of an equal amount of income, and interest is the compensation for this loss” (Cencini, 2005, p. 150). In this vein, with the growth in fixed capital, an increased amount of income must be sacrificed to achieve it (see Cencini, 1995/1997, p. 89). When the accumulation of capital increases rapidly, its remuneration increases quickly, too. In order to keep positive profit margins and thereby remunerate capital, the firms’ rate of profits must increase *pari passu* with the increasing costs represented by the remuneration of fixed capital.

At this point, “a decrease in the rate of profit relative to the rate of interest leads firms to vary the productive investment of their profits” (ibid., p. 90). In such a situation, entrepreneurs may decide to stop investing profits in the production of investment goods (see Rossi, 2001a, p. 194), slowing the process of capital accumulation. Instead of being invested in the production of new capital (and amortisation) goods, the bank deposits that are equivalent to profits must be at least canalised into the *financial market* or invested in the *production of consumption goods and services* (see Schmitt, 1984, pp. 234–9). In the first case, firms spend their bank deposits on the financial market, where inter alia the return on investment is higher than actual or expected profit margins in the non-financial market (see Rossi, 2008, p. 223). In this way, the financial market offers additional profits that the product market cannot provide, increasing the level of debt of the non-bank agents who borrow these firms’ bank deposits (see Schmitt, 1984, pp. 237–8). More precisely, these (pre-existent) bank deposits are likely to be borrowed by households in order for them to spend these financial loans on the product market without inducing an expansion of production activities and increasing employment opportunities (see Gnos, 2012, p. 186). This is the *sine qua non* condition for keeping stable the profit margins of firms, as production costs remain constantly covered as time goes by, but unemployment – precisely, the “involuntary” one in Keynes’s sense – due to the disinvestment of firms is bound to last (ibid., p. 186).

In contrast with what happens when profits remain available as pre-existent bank deposits in the financial market, when profits are spent for the production of new consumption goods and services, deflationary pressures on the general price level may emerge (see Schmitt, 1984, pp. 237–8). In fact, if profits are invested by firms in the production of consumption goods and services, workers’ wages are paid out of pre-existent bank deposits that these firms get for free through the selling of their products (see Cencini, 1995/1997, p. 73). “But then the payment of wages becomes a twofold operation: monetisation of new production on one side, and expenditure of pre-existent [bank deposits] on the other” (ibid., pp. 73–4). As we have noted before, the expenditure of profits implies now the purchase of the output produced by workers, whose wages are emptied of their real content (ibid., p. 74). By paying their workers out of profits, firms therefore remove produced output from wages, so that the number of money units, workers are credited with, is empty (ibid., p. 74). Precisely, the consumption goods and services produced free of cost are directly appropriated and stocked by firms, as workers are credited “with an amount of [bank] deposits to which no new sealable output corresponds” (Rossi, 2001a, p. 150). The investment of profits in a new production process of consumption goods and services thus generates an imbalance between total supply and total demand due to the swelling of the former over the latter, leading to an alarming deflationary gap (see Schmitt, 1984, pp. 237–8).

Given the deflationary gap, if the level of production is determined by effective demand, firms may adjust the former in response to a change in the “real” possibility of selling their produced output (see Keynes, 1936/2007, p. 29; and Cencini and Rossi, 2015, p. 182). To clarify, when total demand is lower than total supply, firms may reorganise their production activities – via, for instance, reductions in selling

prices, wage cuts and laying off some of their workers – in an attempt for them to curtail production costs and recover previous profit margins (see Cencini and Rossi, 2015, p. 182). This situation may even worsen when monetary authorities (that is, central banks) decide to increase the short-run policy-controlled interest rate in order for them to fight against the general price level increase measured through the CPI (see Rossi, 2008, p. 223). That said, an increase in the level of unemployment may thus be a consequence of the implementation of some “managerial measures” adopted by firms to cope with the variation in the interest rate with respect to the profit rate.

Both inflation and deflation may, however, emerge together every time profits are invested by firms in production and thereby wages without purchasing power are paid to workers. If this occurs, the whole economic system may be subject to *stagflation*, to wit, a situation where high inflation coexists with unemployment (deflation) (see Schmitt, 1984, pp. 234–9). Given this, whether they emerge individually or simultaneously, inflation and deflation cause economic disorder, which “negatively affect[s] monetary stability and the well-being of wage earners” (Fumagalli and Lucarelli, 2008, pp. 156–7). Now, it is clear that the origin of this economic disorder is not attributable to the agents’ forms of behaviour, but to the way in which banks carry out the payment of wages to the benefit of workers and enter the equivalent payment order in the architecture for domestic payments. As we will see in the next section, if this accounting operation was recorded in conformity with the threefold distinction between money, income and capital, the economic system would not be affected by the economic disorder deriving from the defective bank-based payment system. Precisely, this logical tripartite structure of banks’ book-keeping allows bank deposits to be distributed among agents without being duplicated in the balance sheets of banks when the latter record the payment of workers’ wages on behalf of firms. In so doing, the rise or fall of inflation should be prevented.

5 Setting the stage for a reform of the domestic bank-based payment system

Inflation and deflation elicit an economic disorder that does not stem from the agents’ forms of behaviour. Contrary to the common belief rooted in the “microeconomic foundation of macroeconomics”, it is not the saving decisions of households, the result of firms’ mark-up policies, the interventions of the government, the credit policies of banks and/or the firms’ way of making investments out of profits that must be put under the lens, but the manner in which the corresponding book-keeping operations take place in the bank-based payment system. To clarify, at the time of writing, banks’ monetary and financial transactions, being considered as similar accounting operations, coexist in a unique bank’s balance sheet (see Schmitt, 1984, p. 196). This implies that the remuneration of workers and the capitalisation of profits are recorded in the same bank’s T-account (see Rossi, 2001a, p. 161). By utilising a unique T-account for the recording of all book-keeping operations concerning production, exchange and consumption activities, banks are not able to make a distinction between monetary and financial

transactions. In particular, when banks carry out the payment of workers' wages on behalf of firms, they make no distinction between the financing of wages with an emission of money (that is, via the loans-create-deposits mechanism) and the financing of wages with pre-existent deposits (that is, through the deposits-create-loans mechanism). Given this, the separation between monetary and financial transactions in banks' balance sheets is of fundamental importance, because it enables banks to work properly and avoid the recycling of bank deposits in the payment of wages.

Following Schmitt's (1984) quantum monetary analysis, we outline a monetary-structural reform to be applied to banks' double-entry book-keeping in order to provide an orderly-working architecture for domestic payments, thereby eradicating inflation (or deflation).¹⁴ Precisely, this reform shows how the payment of workers' wages ought to be recorded in banks' balance sheets when firms spend their profits on production. Obviously, firms do not suffer from this monetary-structural reform, as it only concerns the working of the bank-based payment system. In particular, we propose a structurally-reformed accounting system "providing bankers with a book-keeping instrument telling them the exact amount [of loans] they can lend at each moment in time" (Cencini, 2001/2014, p. 188), reducing the emission of empty money. Certainly, this reformed book-keeping system is consistent with the nature of money and the separation between monetary and financial transactions. This is so because it considers the fundamental distinction between money, income and capital.

In order for banks to respect the previous threefold distinction, every payment carried out by them ought to be recorded in three different departments: first of all, "the monetary department (or department I) records all money emissions, which are instantaneous circular flows that occur every time a payment is carried out. [Secondly, t]he financial department (or department II) records all newly formed bank deposits, which are stocks of purchasing power in the form of liquid financial claims that may be transferred on the financial market and finally spent on the product market. [Thirdly, t]he fixed capital department (or department III) records all capitalizations of profits, which define a macroeconomic saving fixed in some capital goods within firms" (Rossi, 2007, p. 126).

This kind of tripartite architecture of banks' book-keeping makes sure that every time payments are carried out by banks, monetary transactions (recorded in department I) are not confused with income transactions (in department II), and disposable income transactions (in department II) are not mixed up with fixed-capital transactions (in department III) (*ibid.*, pp. 126–7). In so doing, the separation between monetary and financial transactions enables banks to work properly and

¹⁴ This domestic reform, nonetheless, is not enough on its own to avoid inflation (or deflation) globally. In fact, the implementation of a structural reform in the "national" bank-based payment system ought to be, in the Keynes's tradition, prolonged by another one focusing on the architecture of the "international" payment system supporting an emission of supranational money in the settlement of every monetary and financial transaction across any country's borders (see Cencini and Rossi, 2015, for analytical elaboration on this point).

avoid the recycling of bank deposits in the payment of wages, the result of which is the duplication of these deposits without them being endowed with purchasing power. When this occurs, banks can monitor at any time the evolution of the volume of transactions within the (bank-based) payment system and determine with certainty the amount of pre-existent bank deposits they can still lend to non-bank agents without causing an emission of (empty) money, which is not associated with newly-produced output.

Table 3 The result of the payment of workers' wages in banks' departments

Banks				
Issue department (I)				
Assets			Liabilities	
(1)	Firms	+x m.u.	Department II	+x m.u.
(2)	Firms	-x m.u.	Department II	-x m.u.
(*)		0 m.u.		0 m.u.
<hr/>				
Financial department (II)				
Assets			Liabilities	
(1')	Department I	+x m.u.	Workers	+x m.u.
(2')	Firms	+x m.u.	Department I	+x m.u.
(3)			Workers	-y m.u.
			Firms	+y m.u.
(*)		z m.u.		z m.u.
(4)	Firms	z m.u.	Department III	z m.u.
<hr/>				
Fixed-capital department (III)				
Assets			Liabilities	
(4')	Department II	z m.u.	Firms	z m.u.
<hr/>				

Source: Author's elaboration based on Cencini and Rossi (2015)

Note: (*) is the balance of the corresponding department

Let us now explain the application of this reform proposal to modern bank-based payment systems. In regard to this, Table 3 illustrates the payment of workers' wages when firms spend bank loans in order for them to pay for the costs of production. Explicitly, the payment of workers' wages is equivalent to an emission of a number (x) of money units (m.u.) (entry (1)), which quantifies the monetary debt contracted by firms to banks (in department I). From the payment of wages, workers are credited with a sum of money, whose amount is immediately transferred from the monetary department to the financial department (entry (1')). If by the end

of the same day¹⁵ firms are not in a position to reimburse their monetary debt to banks, entry (2) records the amount of loans that will have to be repaid subsequently. An agreed delay in the repayment of debts implies that the monetary debt of firms can be transformed into a financial debt. This latter amount are thus recorded in the financial department via entry (2'), annulling all book-keeping entries entered in the monetary department. Now, the financial department measures (on the assets side) the amount of financial debt that firms still have towards banks as well as (on the liabilities side) the amount of wages earned by workers. At this stage, workers dispose of an amount of y (out of x) money units in their bank accounts (in the form of deposits) that they spend to buy their own produced output (entry (3)). On the market for produced goods and services, firms earn the respective turnover simultaneously, which is used to reimburse those funds that banks originally granted to them when firms paid the wages of workers.

As banks create their “own funding, deposits, in the act of lending” on the factor market (Jakab and Kumhof, 2015, p. 3), bank deposits are similarly destroyed via their spending on the product market. The (final) destruction of bank deposits also coincides with the repayment of the firms’ financial debt to banks. Strictly speaking, if at the end of a given period of time firms do not make profits or workers do not save a part of their income, the total amount of income generated within the economic system is destroyed through the consumption of the total amount of produced output. Accordingly, firms can reimburse the total amount of loans that banks originally granted to them. This mechanism allows for cancelling out all book-keeping entries in banks’ T-accounts, so that both of the balances of the monetary and the financial departments (*) become nil, as z (out of $x-y$) m.u. = 0.

Now, assuming that at the end of a given period of production *wage earners save a part of their income* or *firms earn gross profits from the product market*, the total amount of bank deposits recorded on the liabilities side of the financial department is not destroyed. In the first case, at the instant it is formed, income is saved and transformed into capital-time (see Cencini, 2005, p. 14). So, if at the end of the reporting period the sum of income created through the monetisation of production is not completely destroyed, the balance of the financial department (*) shown in Table 3 does not become nil, as z m.u. $\neq 0$. At this moment, however, it is possible that wage earners will suddenly decide to spend their savings to buy the output stocked by firms. This means that firms can finally sell the accumulated stock of output and notably cancel out their debt recorded in the financial department. By contrast, if savings remain recorded in the financial department, firms may sell securities on the financial market in order for them to recover capital-time and thereby pay their debt to banks. In this way, firms may annul their financial debt and close the corresponding monetary circuit. Both of the balances of the monetary and the financial departments (*) then become nil, as z m.u. = 0.

¹⁵ For instance, “[s]ince banks close their accounts daily, this is the period of time that can practically be chosen as a reference” to cancel out all book-keeping entries in the first department (Cencini, 2005, p. 310).

Up to now, we can confirm that all the accounting operations described previously cause no problems within the bank-based payment system, because the logical link between outputs and their holders (that is, wage earners) is chronologically identified in banks' T-accounts. That said, the main problem relating to banks' book-keeping appears only when firms earn profits on the product market and afterwards invest them in the factor market, while at the same time banks carry out the payment of workers' wages. Let us explain this case.

At the end of every period of production, what is transferred from wage earners to firms in the form of profits may be reinvested by entrepreneurs in another production process. Needless to say, “[p]rofits are in fact [another] source of the capital-time that firms can invest in the production of fixed capital goods. The income earned by firms as a profit is, by definition, an income that has not been spent for the final purchase of goods [and services]. In this sense, profit is a saved-up income transferred to firms, and which immediately takes up the form of capital-time” (Cencini, 2005, p. 292). So, if firms decide to spend their profits on the production of investment goods, the equivalent amount of capital-time remaining in the financial department must be transformed into a macroeconomic saving, as it will be fixed within firms. Consequently, the balance of the financial department (*) does not become nil, as $z \text{ m.u.} \neq 0$.

The transformation of capital-time into a macroeconomic saving allows banks to avoid the recycling of profits in the payment of wages. In fact, if profits reappear in banks' T-accounts in the form of workers' wages, the matching bank deposits have no purchasing power, as these deposits are created by banks with a simple writing of a number in their ledgers. Hence, the process of capital accumulation (in the form of fixed capital) requires the inclusion in our analysis of a third department in the architecture for domestic payments. Our proposition again follows the arguments proposed by Schmitt (1984) that concern the set-up of an ordered (bank-based) payment system allowing banks to “confine” capital-time into the appropriate department (that is, the fixed-capital department), so that the corresponding bank deposits are permanently taken away from the financial market and notably are definitely saved for society as a whole (see Rossi, 2008, p. 227). To state it differently, by transforming but not expending profits on the factor market, the total sum of bank deposits recorded in banks' balance sheets does not undergo changes in purchasing power, as pre-existent bank deposits are no longer recycled by banks for the purpose of the settlement of payments between non-bank agents.

Returning to the example shown in Table 3, entries (1), (1'), (2) and (2') define the payment of wages recorded in the first two departments. If at the end of the period of production firms decide to spend their profits on the production of investment goods (entry (4)), the part of bank deposits corresponding to these profits is still recorded in the financial department (which is equal to $z \text{ m.u.}$). Now, the amount of profits formed as bank deposits “has to be withdrawn from the sum total of savings, because otherwise it will ultimately be spent again on the product market” (Rossi, 2001a, pp. 180–1). Entries (4) and (4') therefore represent the relationship between the second and the third departments. Precisely, these entries define the amount of

profits (which is equal to z m.u.) that must not be recycled for the monetisation of other production processes. In simple terms, even if firms still own the bank deposits represented by entry (4'), the matching amount must not be available to finance new wages on the factor market. Hence, “[a]s soon as profits are transferred to the fixed-capital department of banks, they will no longer finance the payments of wages [...], which will henceforth be carried out just by issuing money as a flow (in the first department), whose result will be recorded as a stock (in the second department) in order to testify” the debt of firms and the credit of wage-earners to banks (Rossi, 2008, p. 226).

According to this reform proposal, the payment of workers’ wages is therefore no longer “imputed on profits” (Schmitt, 1984, p. 323, our translation), as new wages are now financed via an emission of non-empty money. In this regard, the production of investment goods generates a debt–credit relationship among firms and their workers through banks’ intermediation, giving rise to new bank deposits endowed with a power to purchase “the still unsold stock of [produced output], which [is] the substance of the forced saving elicited by entry” (*) recorded in the financial department (Rossi, 2001a, p. 182). Due to this, capital will be accumulated and its amortisation will not exacerbate the creation of empty money and thereby cause an alteration in the money–output relationship.

In sum, inflation (or deflation) does not stem from the distribution of income on the product market, but from the process related to the generation of (national) income on the factor market (see Rossi, 2007, p. 121). This implies that its eradication from the whole economic system ought to occur only through a reform of banks’ book-keeping. To this end, instead of implementing a number of *ex-post* rules and regulations exclusively concerning the agents’ forms of behaviour (as propounded, for instance, by mainstream economists, who play a role as domestic regulators or are the members of committees on banking supervision), reforms with the ultimate aim of eliminating inflation (or deflation) should have an *ex-ante* impact on the bank-based payment system at the instant when payment orders are recorded by banks in their T-accounts. If so, the duplication of bank deposits, the result of which is the creation of deposits without purchasing power, will not lead to inflation (or deflation), as pre-existent bank deposits (that is, profits) will no longer “nourish” another payment of (empty) wages. This means that the creation of empty money ends up, once and for all, eradicating, from the whole economic system, any form of inflationary (or deflationary) pressure on the general level of prices.

6 Conclusion

Money and banking are crucial for the functioning of every monetary economy of production and exchange. In the absence of an orderly-working bank-based payment system, confusion at the level of banks’ book-keeping “incubates” monetary instability and generates pronounced price volatility. The origin of inflation (or deflation), therefore, ought to be found in the way in which the payment orders ensuing from the process of capital accumulation (that is, the investment of profits in

the factor market) are recorded in the architecture for domestic payments. In this respect, solutions to inflationary (or deflationary) pressures on the general price level should only concern the working of the bank-based payment system, rather than criticising the agents' forms of behaviour. Precisely, the bank-based payment system ought to be structured in such a manner that banks' monetary and financial transactions respect (in book-keeping terms) the distinction between money, income and capital. To clarify, banks ought to split payment orders over three distinct book-keeping departments, namely, the monetary, the financial and the fixed-capital departments in order for them to make sure that pre-existent bank deposits (that is, profits) are not recycled in the payment of wages, the result of which is the duplication of these deposits without them being endowed with purchasing power.

By carrying out the payment of workers' wages on behalf of firms, banks must therefore record, through the loans-create-deposits mechanism, the matching payment order in their book-keeping: first, in the monetary department and secondly in the financial department. Successively, if the bank deposits recorded in the financial department are determined by consumers' savings or firms' profits (both in the form of capital-time), banks may, via the deposits-create-loans mechanism, lend these deposits again without original deposit holders necessarily being aware of this financial intermediation. At this stage, if savings are spent by consumers for the purchase of consumption goods and services, the corresponding payment orders do not cause any confusion at the level of banks' book-keeping. By contrast, the main problem related to banks' book-keeping may emerge if firms, rather than distributing their profits as interests and dividends, decide to spend them on the production of investment goods with the aim of forming their fixed capital. This implies that the amount of invested profits has to be withdrawn from the second department, as banks must no longer lend the matching bank deposits on the financial market in order for them to finance new firms' expenditures. The bank deposits that are equivalent to profits must thus be transferred from the financial department to the fixed-capital department, so that they will no longer nourish the payment of (other) wages on the factor market. In so doing, banks will not recycle accumulated capital in the payment of wages and notably the money–output relationship will not be altered. A well-ordered bank-based payment system therefore supports the functioning of the monetary economy of production and exchange and helps to maintain monetary stability by preventing the rise or fall of inflation, which could otherwise act as an “obstacle” to production, exchange and consumption activities.

The theoretical elements contained in this paper represent, however, a few steps in the direction of the “reorganisation” of every monetary economy of production and exchange in which long-period monetary instability will no longer exist. In order to completely reform the modern bank-based payment system, mainstream economists must focus more than ever on the logical validity and the functional aspect of any approach adopted in monetary economic analysis. As most macroeconomic approaches have become standardised on the basis of microeconomic models picturing agents' behaviour, the deep understanding of the natural working of the banking system has been neglected over time. Against this backdrop, the mind's

emancipation in Keynes's sense of economists is becoming increasingly difficult, making them unaware of the fact that today, more than ever, there are economic theories and practices that are more plausible than those defended by mainstream economists. A lack of pluralism within the economics profession does not facilitate the understanding of the proper functioning of the bank-based payment system and its fragility. Without a qualitative leap forward, it will be impossible to overcome the source of the most worrying economic disorders deriving from monetary instability.

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Author

Amos PESENTI

University of Fribourg, Faculty of Economics and Social Sciences, Department of Economics, Chair of Economic Theory and Economic History, Bd. de Pérolles 90, 1700 Fribourg, Switzerland.

Phone: +41 26 300 8259 Email: amos.pesenti@unifr.ch URL: www.unifr.ch/withe

Abstract

This paper shows how a disorderly-working bank-based payment system negatively affects monetary stability. This occurs when firms invest their profits in production with the aim of forming and accumulating (fixed) capital, while at the same time banks carry out the payment of workers' wages and enter the corresponding payment order in the architecture for domestic payments. In fact, if the payment of wages is financed with profits, this payment operation corresponds to an emission of (empty) money without it being endowed with value, to wit, purchasing power. It follows that the existing value of money is "diluted" in a greater amount of money units, so much so that the current purchasing power of each unit of money is reduced. This monetary phenomenon can be defined as inflation, which, in turn, exerts an upward pressure on the general price level. A structural reform of the bank-based payment system, as suggested in this paper, may consequently improve the defective architecture for domestic payments and thereby promote long-run monetary stability.

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Universität Freiburg, Schweiz, Wirtschafts- und sozialwissenschaftliche Fakultät
University of Fribourg, Switzerland, Faculty of Economics and Social Sciences

Bd de Pérolles 90, CH-1700 Fribourg
Tél.: +41 (0) 26 300 82 00
decanat-ses@unifr.ch www.unifr.ch/ses