

A Structural Macroeconomic Analysis of Financial Bubbles

Edoardo Beretta ^a, Alvaro Cencini ^a and Sergio Rossi ^b

^aUniversità della Svizzera italiana, Lugano, Switzerland; ^bUniversity of Fribourg, Fribourg, Switzerland

ABSTRACT

This paper focuses on the structural macroeconomic factors that lead to an extraordinary increase in liquidity feeding financial bubbles at the national and international levels. Contrary to firmly held beliefs, these bubbles do not simply originate from agents' behaviour, particularly speculation, but result from a disorderly functioning of current monetary systems at both the national and international levels. As a matter of fact, the domestic payments system does not distinguish on structural grounds between the emission of money and the opening of credit lines by banks. This gives rise to financial bubbles insofar as banks provide credit lines for 'non-GDP-based transactions,' thereby inflating the volume of bank deposits without any corresponding new production. Moreover, at the international level, financial bubbles expand because key currencies, notably the US dollar, are used as if they were means of final settlement internationally. In reality, they are mere promises of payment, leading to a monetary 'duplication' that affects the international economy as a result of the lack of an international settlement institution providing a means of final payment for each country considered as a whole. This paper therefore suggests a structural-monetary reform to eradicate these problems before another systemic financial crisis occurs.

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1. Introduction

This paper provides the analytical elements to address financial bubbles from a macroeconomic perspective. In contrast to the microeconomic analyses mostly advocated by mainstream economists, we argue that the origin of the problem lies neither with the behaviour of economic agents nor with institutional decisions, but rather with the current systems of national and international payments based on a few key currencies such as the US dollar (Mikesell 1945, pp. 567–8) and their logical shortcomings. In this paper we refer to Bernard Schmitt's seminal contribution (see Schmitt 1973, 1984[2021], 1998[2025], 2014, 2017) and we explain that financial bubbles stem from a mechanism that gives rise to a 'pathological' capital void of any real content whose

CONTACT Sergio Rossi  sergio.rossi@unifr.ch  Faculty of Management, Economics and Social Sciences, Department of Economics, Chair of Macroeconomics and Monetary Economics, University of Fribourg, Boulevard de Pérolles 90, Fribourg 1700, Switzerland

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existence is at the core of the crises of capitalism regardless of the decisions of economic agents. This capital is pathological, as it originates from a structural-monetary disorder resulting from the actual emission of money as recorded in banks' ledgers, which do not explicitly distinguish the monetary and financial intermediation roles of banks, which thereby create a 'pathological capital' when they provide *ex-nihilo* loans for 'non-GDP-based transactions' (Werner 2011, p. 29). This situation will persist if no structural reforms are undertaken to change the dynamics affecting monetary systems. Such reforms to the banking system must aim to prevent the formation of this 'pathological' capital, to make sure that financial bubbles characterised by a structural, macroeconomic origin belong to the past, and that our economies enter a 'new' era of financial stability.

2. A Micro- Versus Macroeconomic Analysis of Financial Bubbles

Economic agents' speculative behaviour, the increased financialization of the economy, the overstimulation of debt-financed spending, the expansion of over-the-counter derivatives investment, repurchase agreements (repos), and so on are commonly considered the main causes of financial bubbles. All these factors can be subsumed under the category of over-lending, which characterises a situation where the volume of debt is higher than total income in the whole economic system and confirms that this can be traced back to extraordinary increases in liquidity (see Bhaduri 2011; Calcagnini et al. 2022; Caverzasi, Botta, and Capelli 2019; Cingolani and Toporowski 2024; Ohno 2014; Palma 2009; Stout 2011).

Even though there is not always an agreement among mainstream economists on what causes financial bubbles, excessive liquidity is generally considered a precondition for economic agents' and financial intermediaries' decisions to trigger a financial bubble.

In fact, before elaborating and testing theories that stress the role of psychological and behavioural factors, over-financialization, or institutional settings, one should investigate what causes a structural (that is, decision-independent) rise in liquidity in the first place. The answer to this research question varies according to whether a microeconomic (to wit, a behavioural and decisions-dependent) or a macroeconomic (that is, a structural and decisions-independent) approach to monetary economics is advocated.¹ If we were to adopt the microeconomic viewpoint of mainstream economics, we would argue that excessive liquidity results solely from central banks' expansionary monetary policies or from the behaviour of financial institutions. On the other hand, if we embrace a macroeconomic approach as in the present paper, we must show that the 'pathological' capital feeding the financial bubble arises from an anomalous dynamic of the monetary system and not necessarily (generally speaking) from central banks' monetary policies and financial institutions' credit strategies.

Such a methodological approach is fundamentally macroeconomic and in line with what a number of heterodox economists have been explaining in their own research work on macroeconomic grounds, such as Keynes's (1933[1973]) monetary theory of production, Marx's (1887[1909]) labour theory of value, and, to some extent, Joan

¹Our paper is hence embracing a 'macro-founded' approach to macroeconomics in contrast with a 'micro-founded' approach that 'connects aggregate dynamics with underlying behavior of the agents that comprise the economic system' (Fazzari 2022, p. 103).

Table 1. Opening of a credit line: the commercial bank's ledger.

Commercial bank			
Assets		Liabilities	
Firm	x money units	Firm	x money units

Source: authors' elaboration.

Robinson's (1956) theory of capital accumulation. As Keynes (1933[1973]) explained, money and output are the two sides of the same phenomenon (namely, production), when the payment of wages occurs. This is also the reason why, in *The General Theory*, Keynes (1936[1973], p. 245) used the expression 'wage units' to measure national income, since, as he explained, labour is the only true macroeconomic factor of production. This is consistent with Marx's (1887[1909]) analysis of labour as the original factor of value, part of which is obtained by what he calls 'capitalists' as a result of workers' exploitation. Robinson's (1956) theory of capital accumulation is also worth considering, as it explains that invested profit gives rise to savings and not the other way round (as claimed by mainstream economics). In this regard, before starting our positive analysis of the formation of 'pathological' or speculative capital, it is worth summarising some important principles of monetary macroeconomics as elaborated by Schmitt (1984[2021]).

(Book-entry) money issued by central and commercial banks has no intrinsic value. It is neither convertible into gold nor legally defined in terms of gold, as '[f]iat money constitutes no claim on anything' (Schlichter 2014, Internet). Issued by banks (whether by an electrical impulse or by the stroke of a pen), money is a mere numerical form, a number entered simultaneously on the assets side and liabilities side of the issuing bank's ledger (Table 1). In other words, when a commercial bank opens a credit line in favour of a firm, it promises the company to pay (say) x money units in favour of its economic correspondent and, simultaneously, the firm promises the commercial bank to reimburse x money units. The promise of the commercial bank is entered on the liabilities side of its balance sheet; the promise of the firm is entered on the assets side of the bank's ledger. From a bookkeeping point of view, money is therefore defined as an asset-liability of the issuing bank. Hence, money as such ('nominal money' using the Classics' terminology) is a numerical measurement unit whose object is the promise of the bank to carry out payments on behalf of its clients. If we were to represent the creation of nominal money, we would do so through a double-entry bookkeeping mechanism, recording in the same instant of time the relevant entry on both sides of the bank's ledger. This is also what the theory of endogenous money confirms, when it explains that bank loans give rise to bank deposits, as famously pointed out already by Schumpeter (1954, pp. 1110–1117) (see, for instance, Lavoie 1984; Moore 1988; Rochon 1999).

Nominal money is an empty, numerical form that is transformed into a positive income — to be called 'real money' ('money's worth' as explained by Smith (1776[1801], p. 127)) — as soon as it is associated with production. As Deleplace and Nell (2016, p. 13) pointed out, 'banks create only 'nominal money', which has no purchasing power; only when the 'baggage checks' or 'promises' are handed out by firms to factors of production do they allow those factors to draw upon the output'. Thus,

this transformation of (nominal) money into income (real money) occurs through the payment of the costs of production, namely, wages, so that national income is necessarily equal to the total of nominal wages:

$$Y_t \equiv \sum W_t \quad (1)$$

where Y_t is the national income at time t , which is identical to the sum of (nominal) wages ($\sum W_t$). Clearly, nothing prevents national income from being successively divided into real wages ($\$W$) and real profits ($\Π):

$$Y_t \equiv \$W + \$\Pi \quad (2)$$

Both identities are consistent with each other, because identity (1) describes the formation of national income Y_t , while identity (2) represents its subsequent subdivision. Moreover, while the former identity is an expenditure (that is, a flow), the latter identity indicates a stock situation, namely the result of the expenditures leading to the substitution of firms for households as income holders. In both cases, ‘[t]he purchasing power of bank deposits [...] depends on the association of money and output that occurs on the factor market at the instant when wages are paid out’ (Rossi 2008, p. 285). This is how money becomes a positive magnitude, and also how (physical) production of goods and services turns into economic production, namely Gross Domestic Product (GDP) or national income (Y_t) representing the ‘standard measure of the value added created through the production of goods and services in a country during a certain period. Consequently, GDP also measures the income earned from that production, or the total amount spent on final goods and services’ (Organisation for Economic Co-operation and Development 2025b, Internet).

The idea that money is being issued already endowed with a positive value is not only dated but logically wrong, being ‘nominal money [...] a widely accepted medium of exchange which has no intrinsic value’ (Goldberg 2000, p. 29). Any central and commercial bank merely acts as a monetary and financial intermediary. As monetary intermediators, banks provide the economy with the numerical form necessary to make physical objects commensurable (Rossi 2017, p. 111). As financial intermediators, they lend to borrowers the income deposited with them by savers. These two functions are logically distinct and should never be linked. In fact, they respectively handle a mere numerical form like money (this is the monetary intermediation function) and positive values like (saved) incomes (this is the financial intermediation function). If these two functions were kept separate by a consistent bookkeeping architecture of banks, their activities could not lead to the formation of excessive liquidity. To date, this is not yet the case, and it regularly happens that banks finance part of their lending through money creation. For instance, the Deutsche Bundesbank (2017, Internet) confirms that ‘banks can create book money just by making an accounting entry’. As Werner (2014, p. 18) noticed, ‘neither I as director [...] nor our staff checked either before or during the granting of the loan to you, whether we keep sufficient funds with our central bank’. Nevertheless, the banks’ inflationary emission of money would not be cumulative over time, and the sum lent in excess would have to be reimbursed, which is a process resembling the ‘sterilization’ of capital inflows to reduce upward pressure on prices (Lee 1997).

If the increase in liquidity that fuels financial bubbles cannot be solely explained by private banks' over-lending or by central banks' monetary policies, how else can they be? The answer we advocate in this paper is that 'pathological', speculative capital originates macroeconomically in the present systems of national and international payments. Hence, we will show through a quantum-macroeconomic approach that the primary cause of financial and economic crises is not the behaviour of 'speculators,' but the anomalous dynamics of national and international payments. In the absence of such a 'pathological' capital, speculators could only operate by investing part of the income produced by the economic system. Their speculation would affect the microeconomic redistribution of income among economic agents but would not alter the macroeconomic relationship between total supply (production) and total demand (national income). If, as most people (including politicians and mainstream economists) believe, banks were mere financial intermediaries, the total amount of loans they grant could not, logically, exceed the total volume of deposits they are able to collect. As a result, speculation could be limited only to the amount of existing deposits and would not affect the money-output relationship (see Cencini and Rossi 2015, Ch. 10 for analytical elaboration). In other words, if banks' book-keeping system of accounts were split into different departments, they would not be able to provide loans out of nothing (*ex-nihilo*) to finance 'non-GDP-based transactions,' but would still be in a position to do so for 'GDP-based transactions,' thereby reducing financial instability while supporting production and thereby the employment level. As a result, speculation would not represent a systemic problem anymore — even though any economic agents would still be in a position to speculate, provided they have any income (either owned or borrowed) to spend across the relevant (speculative) market.

Clearly, any economic agent can bet on anything it likes, in a specific market or at a casino. This kind of speculation is microeconomic, and its existence has no impact on the orderly working of the economic system as a whole. Whatever the outcome (winning or losing), the amount of national production does not vary, and the amount of national income remains unaltered; only its distribution among income holders varies. However, things change radically when the system itself allows for the formation of a positive amount of capital deprived of any real content. This time, speculation is disruptive because it is fed by a capital whose origin and nature are entirely 'pathological'. Instead of blaming merely the speculators' use of speculative capital, we should investigate the causes that lead to the formation of this capital and to the burst of financial bubbles it engenders.

Let us further analyse first the national and then the international dynamics leading to the formation of pathological capital.

3. The National Origin of Speculative Capital

As shown by Schmitt (1998[2025]), it is not easy to pinpoint the mechanism that gives rise to the formation of the 'pathological' capital causing inflation and unemployment. This is so because, apparently, the system of national payments is already in line with the logical economic distinction between money (endowed with no value whenever detached from production) and income, representing the physical production of goods and services measured in numerical, economic terms. Although the monetary and the

financial intermediation functions of banks are not neatly separated, the consequences arising from the possibility for banks to finance their loans by money creation instead of by income deposits are (as we analysed in Section Two) not ‘structural’ and — hence — less negative than generally assumed. Introducing profit into the analysis does not modify it substantially, as long as profit is redistributed as interest, dividends and rents. However, the investment of profit creates a first anomaly in the banking system of national payments. Instead of being transferred to a specific department of banks (which is still inexistent), invested profit remains deposited with banks (which lend it to households). The anomalous nature of this macroeconomic loan clearly appears when firms invest profit to finance the production of instrumental capital. Such investment entails the transformation of part of current income (that is, profit) into fixed capital, and it should be obvious that, once transformed into fixed capital, income should no longer be available in the financial market.

In today’s national monetary systems, banks still lend to households the deposits of profit, even though the investment of profit in the production of instrumental goods defines its irreversible transformation into fixed capital, which is usually defined as ‘produced non-financial assets that are used repeatedly or continuously in production processes’ (Eurostat 2025, Internet). The macroeconomic lending of the deposits of profit characterises today’s capitalist systems and defines the division of the economy into sectors as theorised by Schmitt (1998[2025]). While we limit our analysis here to the ‘pathological’ nature of the perennial reconstitution of the deposits of profit occurring in the present system of national payments, let us observe that the separation between the first sector producing goods and services purchased by households through the expenditure of wages (that is, ‘wage-goods’), the second sector (producing interest-, dividend-, rent-, and investment-goods), and the third sector (producing ‘amortization-goods’ to replace what is lost by fixed capital because of wear, tear, and obsolescence) is used by Schmitt (1998[2025]) to explain the causes of both inflation and involuntary unemployment.

Let us recall the logical distinction between the concepts of ‘money’ and ‘income.’ Issued as an asset-liability, as shown in Table 1, money is transformed into income through production. Then, income is destroyed in the final purchase of produced output. Through production, money, a numerical form, acquires a real content and gives way to income. As Hughes (1986, p. 519) points out, ‘the cost of output is the income of the factors used to produce it. [...] There is the second principle of macroeconomics: output equals income’. If part of the income generated by production is transferred to firms, a profit is formed, which can be redistributed and spent by households on the purchase of the still unsold product. However, if profit is invested in the production of fixed capital goods, the new production costs should be paid through a new emission of money, and profit transformed into fixed capital should be transferred to a specific department of banks. Like any other production, the production of goods and services intended to be used as fixed capital (namely, investment-goods) also creates the income that defines it. Spending an income to finance a production is not only useless, but it gives rise to a chain of deposits and expenditures resulting in the formation of a capital void of any real content.

This is because the expenditure of a positive income (profit) for the payment of wages involves the appropriation by (depersonalised) firms of the real goods (investment-goods) that should ‘fill’ wages. The wages paid to workers for producing fixed capital-

goods are therefore ‘empty’ money, and when spent, they generate a corresponding ‘empty’ profit deposited with banks and then lent to households. Households’ expenditure then generates new ‘empty’ profits, which are deposited with banks and lent in a never-ending chain of deposits, loans, profits, and deposits. It is important to note that these repeated loans are unrelated to those associated with activating a line of credit. New productions are monetised through a new emission of nominal money and not through the use of profit deposits. As a result of this structural-monetary disorder, this chain can inflate a series of financial bubbles that lead to systemic financial crises when they burst (see Cencini and Rossi 2015, Ch. 7 for analytical elaboration).

The process that forms ‘pathological’, speculative capital reaches its final stage when production is extended to what we might call ‘amortization-goods’, namely to that part of production ‘whose goal is to maintain unaltered the efficiency of the fixed capital’ (Cencini, Gnos, and Rossi 2016, p. 70). Schmitt’s (1984[2021]) analysis shows that the current process of capital accumulation is marked by a mechanism that subtracts fixed capital-goods from the economic ownership of income holders. As soon as this capital is subject to amortisation and calls for the production of replacement goods, this process gives rise to a further, pathological increase of capital. This capital overaccumulation explains the national origin of financial, speculative capital. By its very nature, this capital is a sum of empty money that fuels the financial bubble and the related speculative transactions, as it occurred in the period preceding the bursting of the global financial crisis in 2008. Even though such a crisis apparently resulted from banks’ and non-bank financial institutions’ behaviour, in fact, the underlying structural-monetary disorder enabling them to inflate a credit bubble relies on the formation of ‘pathological capital’ as explained by Schmitt (1984[2021]).

The pathological process of capital accumulation structurally induced by the book-entry system of national payments is not the only macroeconomic source of the speculative, financial bubble. International payments are another significant macroeconomic cause of it, as we shall see in the next section.

4. The International Origin of Speculative Capital

What is peculiar about the present system of international payments is the use of few national currencies as means and objects of cross-border payments (Table 2). As explained by Takaya (2006, p. 103), ‘there exists an inherent asymmetry in international monetary regimes between the key currency country and the non-key currency countries. In other words, although the country providing the key currency can make foreign settlements

Table 2. Paying for net commercial imports and duplication.

Banking system of the importer <i>a</i> (country A)			
Assets		Liabilities	
Importer <i>a</i>	$x M_A$	Banking system of the exporter <i>b</i> (country B)	$x M_A$
Banking system of the exporter <i>b</i> (country B)			
Assets		Liabilities	
Banking system of the importer <i>a</i> (country A)	$x M_A$	Exporter <i>b</i>	$y M_B$

Source: authors’ elaboration.

using its home currency, the country providing a non-key currency cannot'. The origin of the system can be traced back to the 1922 Genoa Conference and the agreement signed at the Bretton Woods Conference (July 1–22, 1944), when the post-WWII international monetary regime was reshaped and it fundamentally rests on the assumption that key currencies are net assets that can be given in exchange for real goods and services (Hawtrey 1948, p. 46). Clearly, 'this placed the United States in a unique position. It could virtually spend as much as it wished as long as the rest of the world was willing to accept the dollar and attach a certain value to it' (Teunissen 1987, p. 361).

4.1. The Substantial Difference Between National and International Payments

It is because money is transformed into income that national currencies have a purchasing power within their national economies. This conclusion changes when we examine international transactions. In fact, double-entry bookkeeping does not allow for a national income to be spent abroad nor for any national currency to abandon its domestic banking system.

Any microeconomic agent can spend its income when and where it wants to. When an economic agent purchases goods and services abroad, it can pay for them with its income, which is cancelled from its bank deposit. Yet, when the foreign purchase is carried out by a resident of a key-currency country, the income spent by the economic agent remains entirely deposited with their bank. What changes is the identity of the depositor (now a foreign economic agent), not the deposit itself, which does not leave its country of origin.

What is valid for income is also valid for money, which cannot abandon the banking system that creates it. In this case, too, a foreign economic agent is credited with a positive amount of the key currency used to pay for the original buyer's foreign purchases. However, not a single unit of money can ever abandon its banking system: double-entry bookkeeping prevents it. As described by Newman (2011, Internet), 'dollars never leave the U.S. (other than the small amount of paper currency carried by travellers). They cannot leave the U.S., by definition. The essence of the U.S. dollar is an obligation of a bank in the United States that has an account with the Fed. So, for example, if an American retailer buys some products from an Asian producer and pays for them with U.S. dollars, the ownership of that block of dollars is recorded as now owned by an Asian account holder instead of an American at a bank in the U.S. No money is used up, and no money leaves the U.S.' It thus follows that if an amount of a given key currency is entered both in the banking ledger of the paying country and in that of the exporting country, the amount entered in the latter is but the duplicate of the one entered in the former. Already identified by Rueff (1963), this duplication is what explains the formation of so-called euro- or xeno-currencies, that is, currencies whose duplicates are entered in the ledgers of banks operating abroad, such as 'Eurodollars, Euromarks, Euroyen, Euroswissfrancs, and so on' (Drucker 2013, p. 208).

Deposited in offshore banks, eurocurrencies represent the acknowledgement of debt of the banking system that originally issued the currencies of which they are the duplicates.

4.2. The Duplication of Key Currencies and Their Contribution to International Inflation

The mechanism of duplication is analytically the following: when an economic agent a of country A (having imported goods and services) asks its bank to pay economic agent b of

country B (having exported goods and services), the banking system of importer *a* (country A) credits the banking system of exporter *b* (country B): it enters this amount on its liabilities side, while the banking system of country B enters the banking system of country A on its assets side (Table 2). Now, the importer *a*'s income, denominated in money A (M_A), remains deposited in the banking system of country A, whereas a duplicate of M_A is entered in the banking system of country B. Such a duplicate represents country A's acknowledgement of debt *vis-à-vis* country B, which means that country A's imports have not been paid for. This non-system of international payments gives key-currency countries the privilege of paying by becoming indebted, or 'to give without taking, to lend without borrowing, and to get without paying' (Rueff 1963, p. 322). As Barthalon (2003, p. 297) summarises, '[t]hese dollars are in fact instantaneously recycled to the USA by the central banks which accept them as international reserves. At the same time, they act as the basis for domestic monetary creation in the countries receiving them.' With specific regard to Table 2, the emission of domestic money M_B to credit exporter *b* is what Rueff (1971, p. 17) describes as follows: 'funds flowing out of the United States [...] increase by a corresponding amount the money supply in the receiving market, without reducing in any way the money supply in their market of origin.'

The crucial issue of the current non-system of international payments consists of the use of a few national currencies — the 'top-10' are listed in Table 3 with the US dollar having been used in 44.23 per cent of all international transactions in 2022 — as the final object of cross-border payments.

As once again reminded by Cuff, Sharrock, and Francis (1998, p. 101), '[m]oney is a medium of exchange and is not itself the object of exchange.' In fact, money, as a means of payment, cannot logically be the object of the payment it conveys or vehiculates. Within any national economy, the object of any payment is not a sum of money, but the real product money is associated with. It is because the seller obtains an income, that is, the economic right or purchasing power over part of current production — that it is actually paid by the purchaser. Money plays an important role, of course, but

Table 3. Turnover of OTC foreign exchange instruments, by currency (1989–2022), in %.

	Currencies	1989	1998	2007	2016	2022
1.	US dollar	89.94	86.80	85.60	87.58	88.45
2.	Euro	–	–	37.04	31.39	30.54
3.	Japanese yen	28.03	21.72	17.25	21.62	16.70
4.	Pound sterling	14.51	11.02	14.87	12.80	12.90
5.	Chinese yuan	–	0.01	0.45	3.99	7.01
6.	Australian dollar	2.49	3.03	6.62	6.88	6.38
7.	Canadian dollar	1.40	3.53	4.29	5.14	6.21
8.	Swiss franc	9.72	7.06	6.82	4.80	5.19
9.	Hong Kong dollar	0.94	1.00	2.70	1.73	2.58
10.	Singapore dollar	0.42	1.11	1.17	1.81	2.43
...
Total		200.0	200.0	200.0	200.0	200.0

Notes: data are provided on a 'net-net' basis (April 1989–2022 daily averages) in billions of US dollars. A total result of 200.0% means that there are always two currencies involved in an international transaction (namely, that of the payer and that of the payee). The percentage use of a single currency in all international transactions can be derived by taking the percentage value in each cell of the table and dividing it by 200. For instance, for the United States in 2022: $\frac{88.45}{200} = 44.23\%$.

Source: Bank for International Settlements (2022).

it is not itself the object of the payment. Let us put it in an intuitive way. If a purchaser could give the seller its own IOU, that is, an acknowledgement of debt whose object would be the very acknowledgement of debt issued by the purchaser, would the seller be actually paid? The answer is obviously no, since nobody pays by getting indebted. To pay is to honour a debt, to cancel it, and not to confirm it.²

If we transpose this argument to the international economy, it should be equally evident that no national currency can be the object of cross-border payments. If a country gives just a sum of its national currency in exchange for real goods and services purchased abroad, it gives a mere IOU to its foreign partner. Indeed, outside its issuing country, a national currency defines the acknowledgement of debt of the nation itself as represented by its own banking system.

In this specific regard, the United States has run a trade deficit since 1972, with just two exceptions in 1973 and 1975 (World Bank 2025a), and its balance has been settled in US dollars. Perhaps not coincidentally, its first trade deficit dates to the year immediately after US President Richard Nixon's (in 1971) decision to end dollar convertibility to gold (Nixon 1971). Was the rest of the world effectively paid (that is, in real terms) for its net commercial exports to the United States? The answer is negative for the twofold reason that:

- (1) all the dollars paid by US importers remained deposited within the banking system of the United States;
- (2) outside the issuing country, US dollars define the IOU of the United States itself.

Indeed, eurodollars are bank deposit liabilities denominated in US dollars but not subject to US banking regulations. Eurodollars are hence 'dollar deposit claims upon U.S. banks, deposited (transferred) in banks located outside the U.S., including foreign branches of U.S. banks, so that the funds do not physically leave the U.S. banks' (Woelfel 1994, p. 351). As Schmitt (1973) argues, the eurodollars resulting from the so-called payment of US imports are a cause of inflation internationally, not only within exporting countries, but also in the United States. If foreign central banks invest their US dollar reserves in US treasury bonds — at the time of writing 8526.5 billion US dollars of Treasury securities are held by foreign investors (U.S. Department of the Treasury 2025) — this leads to an entry of eurodollars on the assets side of the US banking system immediately matched by an equivalent creation of dollars to the benefit of the US government (seller of the US treasury bonds). This amounts to an increase in US bank deposits unmatched by an equivalent increase in US national production.

As shown in Figure 1, the size of the eurodollar market (currently, around 13 trillion US dollars (Gensler 2024; McCauley 2024)) evolved very similarly in numerical terms to the accumulation of net trade deficits by the United States. Figure 1 and the analysis carried out so far confirm that net trade deficits accumulated by the United States

²This macroeconomic principle is not in contrast with the fact that several economic agents (for instance, governments, but also corporations) issue new debt instruments (like public or private bonds) to refinance themselves after the previous ones expired, as skyrocketing global debt levels of 100 trillions of US dollars (total public and corporate bond debt) and additional 25 trillions of US dollars of public and corporate bond borrowing in 2024 prove (Organisation for Economic Co-operation and Development 2025a). In fact, refinancing through the issue of new debt instruments is tantamount to replacing an old debt with a new one.

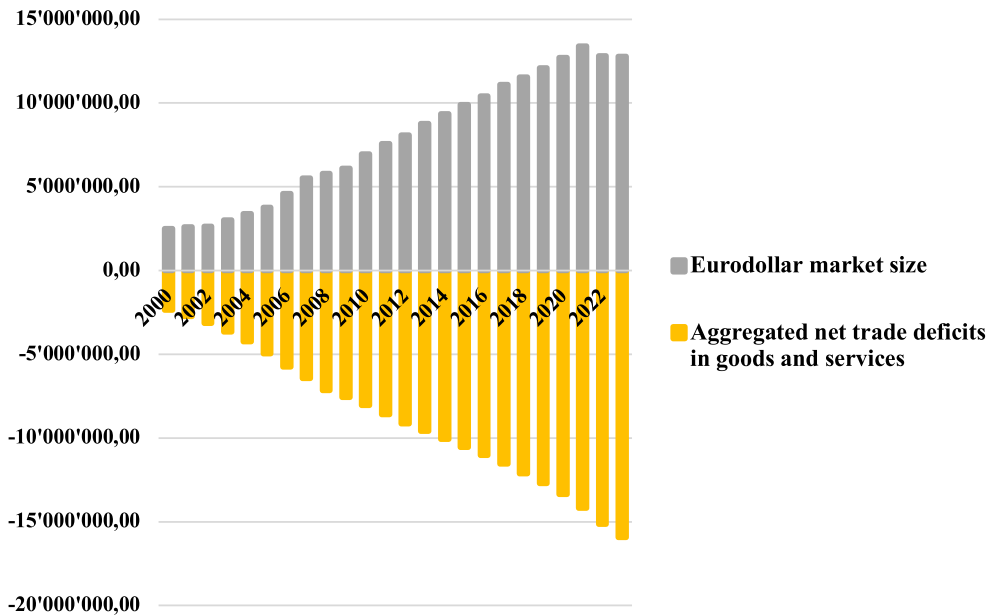


Figure 1. The size of the eurodollar market compared with the aggregate net trade deficits (goods and services) of the United States in million US dollars (2000–23). Source: authors' elaboration.

Notes: data for the 'eurodollar market size' were taken from the Bank for International Settlements (2025) and aggregated from 2000 to 2023 (respectively the first and last available year). Data for the 'aggregated net trade deficits in goods and services' were taken from the World Bank (2025a) and aggregated from 1970 (the first trade deficit of the United States) to 2023 (the last available year), excluding 1975 due to the recorded net trade surplus for the United States.

substantially contributed to the expansion of the eurodollar market — hence, to the duplication of US dollars.

The pathological capital generated by the present non-system of international payments finances speculative transactions, both nationally and internationally. There are therefore national and international anomalies that increase the instability of the current economic system and seriously hamper sound economic growth. Moreover, speculation increases inequalities (see Bodea, Houle, and Kim 2021) and hinders the sound development of productive activity (see Simsek 2021). In the next section we outline the key points of Schmitt's (1973, 1984[2021], 1998[2025], 2014, 2017) proposed reforms of the national and international payment systems to address the issues mentioned above.

5. Policy Action to Prevent the Formation of Financial Bubbles

Since financial bubbles have both national and international origins, two reforms are needed to prevent their formation.

5.1. At the National Level

The first reform is national and calls for the introduction of three bank departments, each corresponding to a specific step of any monetary economy of production: a department

of money, a department of savings, and a department of fixed capital. Ricardo (1824[1951]) had already advocated that the Bank of England introduce a distinction between the first two departments, monetary and financial. As Arnon (2011, p. 382) observes, ‘Ricardo distinguishes for the first time between the two functions of a bank: to issue notes and to act as an intermediary. Furthermore, Ricardo believes that these functions should be carried out by two distinct bodies directed by quite different principles.’ The conceptual basis for this distinction is the substantial difference between money and income, or, in classical terms, between nominal and real money. Even if the current national payments systems are no longer gold-linked and central banks are mostly independent of governments (see Dincer and Eichengreen 2014), Ricardo’s underlying intuition contributing to the Bank Charter Act 1844 (where the ‘Issue Department shall always be kept separate and distinct from the Banking Department’ (legislation.gov.uk. 2025)) appears to be all the more valid in times of trillion-high transactions. In the absence of such a distinction, monetary emissions could mingle with financial intermediation, and banks could finance the latter through the former, leading to the substitution of a mere empty numerical form (money as such) for a positive income derived from production. The monetary and financial intermediations of banks should not be confused; the introduction of the first two departments has precisely the function of preventing banks from lending a sum of empty money instead of a positive income. As shown in Table 4, Department I would handle wage payments, as these payments involve issuing nominal money. Extending this to Department II, where savings are recorded, ensures the formation of a positive income benefiting workers (recorded as a liability in Department II).

As highlighted by Schmitt (1984[2021], 1998[2025]), the need for the third department arises instead from the necessity to prevent profit that has been converted into fixed capital from remaining available in the financial market as a bank deposit. The mechanism that would avoid the loan of an income (profit) transformed into fixed capital through its investment in the production of instrumental goods is described in Table 5: banks will transfer to the third department the profit earned by firms and initially entered in the second department. If part of the profit is redistributed to households as interest, dividends, or rents, it will be transferred back to the second department; if it is invested in the production of capital-goods, it will remain deposited in the fixed capital department, where it defines the current macroeconomic saving of the economy.

Table 4. The payment of wages through the first and second departments (respectively, for money emissions and savings).

Banking system Monetary department (I)			
Assets		Liabilities	
Firms	x money units	Saving department (II)	x money units
Banking system Saving department (II)			
Assets		Liabilities	
Monetary department (I)	x money units	Workers	x money units

Source: authors’ elaboration.

Table 5. Transferring the profit (recorded in the second department) to the third department.

Banking system Saving department (II)			
Assets		Liabilities	
Output	<i>x money units</i>	Firms	<i>x money units</i>
Firms	<i>x money units</i>	Fixed capital department (III)	<i>x money units</i>
Banking system Fixed capital department (III)			
Assets		Liabilities	
Saving department (II)	<i>x money units</i>	Firms	<i>x money units</i>

Source: authors' elaboration.

For simplicity, we note that the reform — by replacing the present division of the economic system into three sectors of activity with the distinction between bank departments — enables banks to implement a mechanism consistent with the analytical distinction between money, income, and capital (see Carrera and Cencini 2024; Cencini 2005, 2023; Cencini and Rossi 2015). Through its implementation as an accounting protocol, it will be impossible to mix up money creation and financial intermediation. Additionally, the pathological macroeconomic loan of the deposits of profit would be eradicated, and the process of capital accumulation would no longer contribute to the formation of financial bubbles.

5.2. At the International Level

The aim of the proposed reform is to prevent the use of one or more national currencies as international money and avoid the formation of eurocurrencies feeding the financial bubble of international origin. Its core principles are inspired by Keynes's (1978) proposals for the establishment of an International Clearing Union (ICU) ranging back to the 1940–44 period. In the Keynes Plan, the new international currency (the *bancor*) would still have been pegged to gold, and its vehicular role would therefore not have been clearly screened off against the possibility of it acting as the object of international payments. A modern system of international payments must instead rest on the pure vehicular use of a numerical means of payment designed to transform heterogeneous national currencies into homogeneous numerical units. Conversely, real payments require the implementation of a system of multilateral clearing ensuring that real goods, services and financial assets are exchanged against equivalent real goods, services and financial assets through the vehicular use of the new supranational currency (see Schmitt 1973, 2014, 2017).

The implementation of such an international reform would certainly require a worldwide agreement between countries under the coordination and supervision of the International Monetary Fund (IMF) representing 191 member countries or at least between a significant group of countries such as the European Union (EU), comprising 27 member countries, or the BRICS group (which already includes ten member nations, namely Brazil, Russia, India, China, South Africa, Egypt, Ethiopia, Indonesia, Iran and the United Arab Emirates).

To be sure, Schmitt (2014) also proposed a single-country reform to give each country the opportunity to adopt a system that would let it avoid the negative effects of the

current non-system of international payments. The mechanism proposed by Schmitt enables any country to carry out cross-border payments as if a new international payments system already existed. Today, non-key currency countries pay their net imports twice: once by transferring the rights to part of their future production, and again by becoming indebted to obtain the foreign currency needed to pay foreign exporters. The addition of the monetary payment to the real one is a consequence of the current non-system in which deficit countries must purchase the key currencies needed to convey their real payments abroad. By implementing Schmitt's plan, the country will reduce this double charge to a single one.

In this article, owing to space constraints, we cannot delve into the details of Schmitt's reform mechanism, which are elaborated upon in Schmitt (2014, 2017) and Cencini (2023). Our goal is simply to show that economic and financial crises of international origin are unavoidable consequences of a disorderly system built on an erroneous conception of money and payments, and that a solution exists to replace disorder with order, guiding us towards a well-structured international payments system.

6. Concluding Remarks

Economic and financial crises — which exacerbate income and wealth inequalities but also hamper economic growth and increase unemployment while eroding money's purchasing power — are the distinctive features of today's capitalism. Their 'symptoms' are mostly speculative transactions carried out by banks and non-bank financial institutions, and debt finance spending encouraged by over-the-counter derivatives, collateralization, asset-backed securities, commodity options and future contracts, as already highlighted by the economic literature (see Chabakauri and Yueyang Han 2020; Jones 2016; Salifu 2018). However, it is inappropriate to attribute crises solely to the growing number and variety of financial instruments or to their excessive use by speculators. According to our analysis, economic systems rest on a set of macroeconomic, logical laws that are not influenced by economic agents' behaviour. If macroeconomic crises occur, it is not because of wrong decisions taken by economic agents, but because our monetary systems of national and international payments fail to comply with these logical laws.

Specifically, the culprit must be identified by the presence of a dynamic that leads to the formation of 'pathological' capital, which fuels speculation and causes financial bubbles. If the macroeconomic systems of national and international payments were sound, no financial bubble would form, and speculators would have to limit themselves to speculative microeconomic transactions that would not impact the economic system as a whole. The distinction between macro- and microeconomic speculation is clear. The former involves a 'pathological,' 'empty' capital that generates financial bubbles, while the latter denotes the speculative investment of current income in risky transactions (including bets, lotteries, casinos, and so on). The former reflects the disorderly functioning of the economic system as a whole, whereas the latter does not affect the system but merely causes a partial, new redistribution of income among income holders.

The principles of the two structural-monetary reforms needed to prevent the formation of this speculative capital respect the numerical nature of vehicular money and comply with the threefold distinction between money, income, and capital. Macroeconomic crises — in contrast to microeconomic ones, as outlined in this paper — arise

from the failure of national and international payment systems to follow the logical laws of monetary macroeconomics; they will disappear once these structural faults are overcome. This does not imply that no further financial or economic crises will occur: however, once those structural-monetary issues that we pointed out in our paper are solved, these crises will not have any systemic consequences across the economic system anymore.

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Author contributions

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ORCID

Edoardo Beretta  <http://orcid.org/0000-0002-2196-455X>

Alvaro Cencini  <http://orcid.org/0000-0002-5117-5703>

Sergio Rossi  <http://orcid.org/0009-0002-5926-5356>

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