# Whence and Whither Money?

### Introduction

Money goes back a dizzyingly long way in Indo-European civilisation. Well before the invention of minted coins in the Lydian cities of the Aegean in the 7th century BCE, writings from the Sumerian civilisation at Ur in the 3rd millen- nium BCE refer to documents mentioning silver struck with the head of Ishtar. The mother-goddess and symbol of fertility, Ishtar was also the goddess of death. So from the very outset, money’s ambivalence reflects the ambiguity of its social function: an instrument of cohesion and pacification in the community, it is also at the centre of power struggles and a source of violence.

Money towers over the market economy as we know it from so high and so far that its shadow throws suspicion on the prevailing economic wisdom, which inci- dentally also creates unease within the profession itself. After all, did not Hahn assert that the perplexing difficulty of the theory of value lay in the inability to account for the universality and durability of money?

Economists cannot therefore regard the history of money as a sort of “natural” history which should immediately make sense. The OECD conference invites us to view money as a force driving economic and social change. This position is incompatible with the neutrality of money, which is the theoretical cladding for its supposed unimportance in co-ordinating economic actions.

Necessarily, therefore, the first part of this chapter takes an alternative theo- retical approach to the prevailing view of the paradox of money in economics. According to this alternative view, money is the primary standard of exchange, the fundamental institution of the market economy. By setting out the analytical impli- cations of this theoretical foundation, we can postulate the processes whereby viewing money in terms of the path it has taken through history makes sense. These processes are abstraction, centralisation and control.

The second part analyses the advance of abstraction, arguing that money’s most fundamental dimension is as a unit of measurement of value. This gives money an irreducible fiduciary aspect. Money’s first path through history therefore involves the development of forms of trust.

The third part considers centralisation in payment technology. In this light, trade relations appear as networks of networks. The process is constantly renewed, since innovative forms of payment have to pass the test of general acceptability. The fragmentation of means of payment that derive from a single unit of account is overcome by centralised organisations, which are transformed by the appearance of new forms of payment.

The fourth part considers the advance of control, anchored in payment sys- tems themselves and designed to maintain trust. Control unfolds over time. Here, money is intimately linked to credit, and trust is expressed in belief in a store of value. Control is therefore exercised upon finance, and through finance upon the economy as a whole.

The idea that the economy is controlled by money exacerbates to the highest degree the opposition between the institutional approach and the assertion that money is neutral. Assuming this opposition, the conclusion outlines a few ideas about the opportunities and risks of the new forms of money that are beginning to emerge.

### The paradox of money in economics

In a recent article, Goodhart commented that the argument between the two concepts of money goes back to the origins of modern economic thought, in the controversy between Bodin and Malestroict in the 16th century. The realist theory, or metallist in its earlier formulations, asserts that money gets its value from its guarantee, which may be the intrinsic value of the metal or the value of saleable output as a whole. This current of thought cares nought for history, preferring to tell a tale in the form of a fable: in the beginning was barter; money came about on the initiative of the private sector in order to surmount the transaction costs of barter. The institutionalist theory, or cartalist in its earlier formulations, asserts that the guarantee is that of a collective authority, which may be a group of private agents but tends to become the state. By this way of thinking, value is not intrinsic but results from the organisation of commodity exchange by money.

Among economists, the realist theory predominates. From Locke to Jevons to Patinkin via the Austrians Menger and Von Mises, it continues into the more recent approaches to monetary theory taken by Ostroy and Starr, Kiyotaki and Wright. The institutionalist view, popularised by Knapp and above all Keynes, is now defended by most neo-Keynesians. More importantly, though, as noted by Mélitz and shown by Aglietta *et al.*, it has won the approval of a large majority of historians and anthropologists with an interest in the origins and history of money.

Some commentators have tried to straddle both positions, with varying degrees of success. Samuelson, for example, sought to support his reconciliation of opposites by dissociating quality and quantity, arguing that money is qualita- tively essential. But the quantitative theory is true: changes in the stock of money affect nothing but the general level of nominal prices. The dissociation is between two temporalities which do not interact. The first is historical, the emergence from barter of a space filled by money. The second is logical, the operation of market economies once money has been created. In this time dimension, money is purely instrumental. It has no lasting effect on economic behaviour.

Such efforts at eclecticism are highly illustrative of economic liberalism’s obsession with exorcising the power of money in order to smooth the way for a pure economy of contracts between individuals. But it is unsatisfactory from the standpoint of both history and economic behaviour. In the first case, Samuelson would like to have us believe that the history of money stops as soon as the first money payment replaces barter. By this view, the development of forms of pay- ment is unimportant. In the second case, private behaviour would have no effect on monetary innovation if agents everywhere always behaved as though money were unimportant. This position makes it impossible to understand the effect of the great wave of inflation in the 1970s on the liberalisation of the financial sector and on subsequent changes in the principle of monetary authority, in the form of central bank independence.

Fortunately a synthetic approach exists, that of Simmel, which provides much more fertile ground for the issues that concern us here. Although Simmel must cer- tainly be counted an institutionalist, he represents money as a fundamental norm, an abstract expression of the community, which is not a creature of the state. Sim- mel takes trade as his starting point, following the line taken by the Austrian school and used in current forward-looking monetary models. However, he rejects both the utilitarian approach and the *ad hoc* hypothesis of transaction costs. Funda- mentally, Simmel regards trade as a social link. Instead of considering trade as an interdependence between economic subjects with prior preference structures which are therefore exogenous to trade, he defines trade as an abstract form which conditions the mental structures of individuals by mediating their actions. It is the direct opposite of Samuelson’s approach. Money expresses social interdepen- dence, unknown to individuals, because it is pure quantity. Money is therefore consubstantial with trade. It is because money’s quality is expressed in a homo- geneous quantity that the subjects of the market economy can become rational. It follows that the development of the market economy and the growing abstraction of monetary forms increasingly detached from their symbolic media describe the same historical framework.

This powerful theory, defining money as the objectivised form of trade stripped of any idiosyncratic element, posits it as the formal operator of economic value. The implications are vast. Since money is itself the expression of the value of economic objects, there can be no substantial value to guarantee it. The subjec- tive attitude with regard to this social abstraction is trust, meaning the supposition that money will always be accepted in trade by third parties unknown to the other two. But because money is pure quantity, far from being unimportant as Samuelson claims, it is the source of the desire for riches. That is where money’s ambivalence lies. On the one hand, collective trust in the power of money holds out the prom- ise of harmonious trade; on the other, the power of money triggers crises which are causes of disorder in the economy as a whole. The two terms of this contradiction become increasingly acute with the global spread of capitalism. That is why trust cannot dispense with regulation, or regulation with public authority.

Supporters of the realist approach to money cannot talk meaningfully about trust even though the word is constantly on their lips. What does trust matter if money is neutral? More profoundly, the present-day realist approach is based on a theory of the market economy which sees it as a coherent set of incentive contracts between private agents. But trust is not a contract. It is not a relation- ship between individuals but a relationship between each private agent and the community as a whole. This relationship makes sense in the institutionalist approach because according to that view money represents the community of economic agents, which is a community of payments. Trust is expressed in the unconditional acceptability of money. As this acceptability has no “natural” guar- antee, it may be shaken or even destroyed in monetary crises. Maintaining trust must be regarded as a regulatory problem of the utmost importance. The problem can be formulated only by identifying the forms of trust and how they relate to each other.

The first form of trust is methodical. Founded on routine or tradition, it derives from the repetition of actions which bring trades to a successful conclusion and ensure final settlement of private debts. This type of trust expresses a secu- rity dimension through common adherence to the objectivised rule. A framework of references and roles within which private agents mould themselves, it is the result of regularity. The only form of trust recognised by Hayek and his disciples when they describe their “organic” society, it becomes incorporated into market practice through the repetition of business relationships. Its manifestations in this context include keeping one’s word in financial dealings, the existence of a club mentality that creates mutual assurance, the acceptance of prudential standards in organised markets.

However, methodical trust pales into insignificance before the furious rival- ries unleashed by the power of money. Regularity is left reeling by financial innovation, prudence counts for little against the lure of profit. Moreover, private trade does not constitute the entire economy: far from it. Money also expresses the economic operations of the state, which have their roots in a quite different rationale, that of sovereignty, the legitimate power to transfer, tax and spend in the name of the tutelary protection exercised by government over the members of society. A hierarchical trust exists, therefore, which the political authority imparts to money. The attributes of this trust depend, of course, on the legiti- macy (religious or democratic) of that authority. The history of money is there- fore also interwoven with that of the process, lasting many centuries, which brought democratic nations into being. In all cases, however, hierarchical trust is sustained by symbols of belonging which, as the seal of sovereignty, are inscribed on fiduciary money.

Hierarchical trust is superior to methodical trust because the political entity with authority over money has the power to change the rules. But this power is not arbitrary, since each nation’s sovereignty is limited by that of its fellow nations whereas private exchanges transcend national borders. Thus, the regulation of money changes according to historical ebbs and flows in the internationalisation of trade. But more fundamentally, and a point on which Simmel lays particular emphasis, the growing abstraction of money engenders abstraction of the individ- ual. The rational human being, free of any social relationship other than voluntary trade, becomes a universal value. Human welfare is a duty internalised within individual reason. It is therefore an ethical attitude. It follows that ethical trust lim- its the exercise of political authority over money. It is at this higher level of legiti- macy, and only there, that Frankel can raise the question of the conflict of trust and authority. In order to be legitimate from an ethical standpoint, policies relat- ing to money ought to be consistent with a monetary order. This order is supposed to subordinate the state’s control of money to the primacy of maintaining the value of private contracts over time. However, Frankel wrongly contrasts Simmel with Keynes because his conception of the monetary order is ossified by nostalgia for the gold standard and by identification of the human being with the bourgeoi- sie of the *Belle Époque*. But the 20th century was the period in which salaried employment became the norm and social rights expanded, becoming an integral part of human welfare. Assuming the social debt is a political responsibility which affects the regulation of contemporary money, which in turn is subject to a highly contradictory play of forces. These forces will make the early 21st century fertile terrain for energetic monetary innovation.

However that may be, we now have a set of hypotheses with which we can venture into the history of money without fear of getting irredeemably lost. Our aim is to understand that the story of money has been a tale of innovation from the outset and that, while there may be much sound and fury, it nevertheless also signifies something.

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Money and unit of account: the advance of abstraction

According to the theory advanced above, money has its essence in number, the realm of quantity. For very lengthy periods, societies were able to trade with- out generally accepted means of payment. But it is inconceivable that an economy spanning a large number of traders and tradable objects can exist without a generally accepted unit of account.

All the anthropological and historical evidence contradicts the argument put forward by supporters of the realist theory, according to which the use of money as a measurement of value results naturally from its use as a means of exchange. On the contrary, understanding the phenomenon of money involves admitting the opposite proposition, namely that money is created by the institution of a stan- dard of values, which results from an act of sovereignty by the community. Egypt under the Pharaohs, a highly evolved barter economy, had a money of account called the *shat*, though it is uncertain whether it was an ideal unit or a standard defined by a gold ring of a given weight. Whatever the answer, property and goods exchanged by barter were valued in *shats*.

It is trade over time that gives a unit of account its fiduciary quality, because the fact of drawing up a contract presupposes a reference value, sufficiently stable and known to all those involved, so that each party gives and receives what was agreed at the outset. As long as the unit of account remains ideal, stability for pri- vate agents is the effect of the apparent movement of prices whose centre is the unit of account, in the same way that the earth is the fixed centre of the Ptolemaic system. The same no longer applies, however, when minted money circulates as a means of payment. In order for the monetary symbol to become generally accept- able, it must be certified by the sovereign authority. In this case, though, the sov- ereign authority can manipulate the sign by way of monetary reforms in order to transfer value between social groups or use monetary abstraction – *i.e.*, separation of the sign (the monetary unit) from the thing signified (the weight and grade of the minted metal) – for its own benefit.

#### The hyperbole of monetary abstraction

In the early 6th century BCE, the Athenian ruler Solon carried out the first known monetary reform, described by Plutarch. Reducing the value by weight of the drachma by 30%, the reform was intended to relieve the debts owed by poor peasants to landowners so as to make it more difficult for them be taken into bondage for debt. The reform was the first stage in a process of monetary abstrac- tion that would last for many centuries. The path it follows is that of the irrevers- ible and general devaluation of units of account in terms of the weight of minted mental, culminating in the 20th century in the complete separation of unit of account and metal. The unit of account defines itself. Exclusively fiduciary, it is the unit of the issuing institution’s liabilities.

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We shall begin by trying to discover whether this path obeys a quantitative law. Then we shall consider the principal qualitative stages in monetary abstrac- tion. They show that the social invention of money stems first and foremost from the sovereign authority. They also underline that in the process, phases of rapid change alternate with phases of stability. The fineness and weight in gold and silver of coins can be measured precisely. From this information, it is possible to calculate the weight of pure gold whose price is equivalent to the unit of account in which the coins are denominated, taking into consideration the relationship between gold and silver when the unit of account is defined in silver. In the case of legal tender, it is assumed by convention that the metal content of the unit of account is the recipro- cal of the price of pure gold on the free market. Cailleux has collated this informa- tion, which is presented in summary and simplified form in [Table 1](#_bookmark6).

Table 1. **From Antiquity to Charlemagne and from Charlemagne to the franc**

Era Unit of account[1](#_bookmark7) Pure gold content in milligrammes

Franc equivalent price of a kilo of pure gold[2](#_bookmark8)

|  |  |  |  |
| --- | --- | --- | --- |
| Cresus (–560) | Pound weight | 450 000 | 0.022 |
| Sylla (–87) | 20 As libral | 218 800 | 0.046 |
| Caesar (–45) | 20 Aureus | 162 700 | 0.061 |
| Augustus (0) | 20 Aureus | 156 000 | 0.064 |
| Nero (52) | 20 Aureus | 145 000 | 0.069 |
| Diocletian (295) | 20 Aureus | 109 000 | 0.092 |
| Constantine (312) | 20 Solidus | 90 000 | 0.111 |
| Salic law (620) | 20 Solidus | 76 000 | 0.132 |
| Charlemagne (805) | Livre | 24 000 | 0.42 |
| Louis IX (1266) | Livre tournois | 8 270 | 1.20 |
| Philippe le Bel (1311) | Livre tournois | 4 200 | 2.38 |
| Louis XI (1480) | Livre tournois | 2 040 | 4.90 |
| Henri IV (1600) | Livre tournois | 1 080 | 9.26 |
| Louis XIII (1640) | Livre tournois | 621 | 16.1 |
| Louis XIV (1700) | Livre tournois | 400 | 25.0 |
| Louis XVI (1789) | Livre tournois | 300 | 33.3 |
| Bonaparte (1803) | Franc | 290 | 34.2 |
| Poincaré (1928) | Franc | 58.9 | 170 |
| Daladier (1938) | Franc | 24.75 | 404 |
| Pinay (1958) | Franc | 1.88 | 5 320 |
| Giscard (1972) | Centime | 1.08 | 9 290 |
| Barre (1979) | Centime | 0.23 | 43 000 |

1. The nominal correspondence between units of account is: 20 Aureus ~ 20 Solidus ~ 1 livre.

1 livre tournois ~ 1 franc = 100 centimes.

1. The nominal continuity of the franc was broken in 1960 by creation of the new franc: 100 old francs became one new franc in 1963.

*Source:* Cailleux, *Revue de Synthèse*, No. 99-100, July-December 1980, p. 253.

[Table 1](#_bookmark6) suggests that over the last 2 500 years, units of account have depreciated at a more than exponential rate. The depreciation rate increases over time. Cailleux shows that it is possible to adjust an exponential-hyperbolic distribution

to these data, of the type: *p = -------a* where p is the price of gold and t is time.

*b* – *e* *t*

This distribution is intriguing because the price of gold and the rate of

increase in the price of gold tend towards infinity in a finite time. As it is not a steady process, however, it is not possible to calculate the future date when the price of gold reaches infinity from the parameters of the function estimated on past data series. It would mean that units of account have no longer an expression in gold, however indirect this expression may be. Periods of accelerated deprecia- tion are, though, interrupted by periods of stability which stop the process from running away with itself, completely cutting the unit of account from any equiva- lence to gold. However, this is not always the case. The way in which monetary cri- sis can degenerate into hyperinflation proves that currencies can be destroyed locally, and hence that monetary sovereignty is not immortal.

One particularly noteworthy period of stability is the one that followed Caesar’s reform creating the Aureus based on a gold standard. It lasted for more than two centuries, since under Nero the Aureus had depreciated by only 10%, and in 215, under Caracalla, by only 20%. But the economic crisis of the 3rd century triggered rapid change: the monetary economy in the provinces receded and trade contracted throughout the entire Roman world. The reforms of Diocletian and Constantine sought to re-establish the Empire’s monetary unity, which was beginning to crumble. But stability was short-lived. A dearth of precious metal and the disintegration of the western Empire led to the break-up of territorial units in western Europe during the High Middle Ages. The apparent stability of the Solidus is that of a unit of account which no longer circulates, the symbol of a distant sovereignty which fades with time.

The monetary anarchy of the High Middle Ages put an end to the monetary system of Antiquity. In that system, the monetary instrument had become increas- ingly detached from the measure of weight, but the unit of account remained attached to the metals. That is why, when coins in circulation depreciate, the polit- ical authority seeks to create coins which, invested with the prestige of sover- eignty, are intended to be inalterable. These prestige coins are the indispensable monetary references for determining the economic value of traded goods.

Charlemagne started a process which ended with Louis IX four centuries later. It was a radical innovation in the history of human civilisation, because it would pave the way for bank money. It was the invention of a purely abstract money of account – the livre tournois in France, the pound sterling in England – in relation to which species in circulation were defined. The outcome was the dualist mone- tary system which would last in France from the 13th century until the Revolution.

In order to impose the royal money and reduce seigniorial money to loose change, Louis IX minted the gold écu and silver gros in 1266. More importantly, however, in a sovereign act he set the value of the coins in terms of an abstract unit of account, no number of which was inscribed on the coins. He thus left his successors with the option of altering the money by decree without having to change the weights and fineness of the coins in circulation. For five centuries, monetary alterations would be the instrument of royal policies which involved devaluing or revaluing the unit of account according to the interests of the state as public debtor or fiscal creditor. The system allowed for much more rapid devaluations than in Antiquity.

The same rationale applied in Britain. [Table 2](#_bookmark9) shows the depreciation of the currency over a millennium. But stabilisation in Britain, due in no small measure to the creation of the Bank of England in 1694, arrived much sooner and lasted much longer.

Table 2. **Depreciation of the pound sterling**

Era Pure gold content in milligrammes Price of a kilo of pure gold in pounds

|  |  |  |
| --- | --- | --- |
| William I (1066) | 24 000 | 42 |
| Edward I (1278) | 20 500 | 48 |
| Edward III (1350) | 17 400 | 58 |
| Henry VII (1489) | 15 470 | 64 |
| Henry VIII (1535) | 9 200 | 108 |
| Elizabeth I (1560) | 7 750 | 128 |
| George III (1793) | 7 320 | 136 |
| George V (1926) | 7 320 | 136 |
| George V (1931) | 4 400 | 228 |
| George VI (1949) | 2 488 | 402 |
| Elizabeth II (1976) | 450 | 2 220 |
| *Source:* de Foville and Cailleux (*op. cit.,* p. 254). |  |  |

It is important to underline the difference between the paths followed by the currencies of France and England. It shows the interaction of the multiple pro- cesses which inform the development of money. Decisions about the unit of account taken by the monetary authority may encourage or discourage private monetary initiatives to create new means of payment. In order to understand it, we must analyse the contradictions of the dualist system.

#### The rise and fall of the dualist system

Thomas (1977) has conducted a detailed analysis of the dualist system on which it is possible to rely. Nominal alterations of the unit of account strengthened coins in circulation as the unit of account weakened. When the monarch decided

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to raise the value of the gold écu by 20%, all the other coins fell into line with the new definition of the money of account according to their relative value. But of course the relative value of the coins raised the problem of bad money driving out good because of the distortion between the stated value of the coins and the commercial price of the metals. This “law” had already been stated by Oresme in the 14th century, two centuries before Gresham, to whom it is attributed. However, the fact that the unit of account was an abstract quantity meant that the broad problem of suiting the money supply to the needs of the realm could be dissoci- ated from that of the structure of means of payment.

The needs of the royal finances certainly played a key part in successive alterations to the livre tournois, but it would be wrong to leave it at that. In the first section, money was defined as the fundamental principle of trade, the social medium which steers the economy as a whole and which the state cannot manipu- late arbitrarily. However, historians note that a change in the way these alterations are perceived takes place towards the end of the 15th century. Previously, they had been defined in relation to the money of account, represented as the centre of the monetary system. Afterwards, they were defined in relation to metal money and hence identified as devaluations of the unit of account. At the same time, mis- trust of the livre tournois appeared during periods of great instability. Attempts were made to substitute alternative references when drawing up contracts. Private units of account were used despite the royal ban. What was the reason for this major switch from trust into mistrust of the livre tournois?

It is probably to be found in the long-term cycles of European history after 1000. Lengthy periods of economic prosperity, rising prices and plentiful money were followed by periods of penury, falling prices and scarce money. After the ultimate failure of the Crusades, the 14th and 15th centuries were periods of devastating deflation, aggravated by profound and lasting social ills such as cli- mate cooling, the demographic catastrophe caused by the Black Death in 1348-49, and the Hundred Years’ War. Devaluing the money of account was the only way to fight deflation, and the occasional attempts of some monarchs to revalue met with resistance from guilds and the populace at large. In contrast, when precious met- als flowed into Europe from America in the 16th century, the depreciation of the money of account amplified the inflationary effects of abundant money, so that Bodin and Malestroict were both right. The devaluation of the livre tournois thus sparked off acute social conflict.

In order to gain a better understanding, let us contrast the dualist system and the contemporary system of fiduciary money in which the money of account and the means of payment are the same. In the current system, if the unit of account depreciates, creditors in nominal terms and those who hold liquid assets both lose out. In the dualist system, creditors and hoarders were on opposite sides. The purchasing power of debt decreased in terms of metal equivalent, while the purchasing power of cash increased until the rise in prices caught up with the depreciation rate. With the growth of private credit, in which the rise of capitalism had its origins, mistrust of the money of account hindered the productive utilisa- tion of savings. That is why monarchs carried out occasional revaluations in order to raise the value of the livre tournois. They were attempts to restore confidence in the unit of account. But these sporadic efforts were merely expedients. In order to flourish, private business needed lasting stability, a transformation of the mon- etary system. The fact that this transformation took place much earlier in England than in France is a contributory factor to that country’s dominance of the 17th and 18th century world.

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#### From the dualist system to convertibility

As Thomas points out, if capital is to be tied up over a long period, the long- term benefit of hoarding must be replaced by the long-term security of invested savings. This step towards a higher abstraction was achieved by the monetary rev- olution of the 16th and 17th centuries, though not in France. The monetary revolu- tion preceded the industrial revolution by a good half-century. The former created the economic and social structures within which the latter was able to take place. It was not a functional cause but a structural precondition.

In capitalism, money is created endogenously as a counterpart to private debt. Purely private acknowledgments of debt must be able to circulate like cur- rency. The following section on payment technology considers how this system is organised. But the power of private credit also has knock-on effects on the mone- tary system. It took four centuries, from Charlemagne to Louis IX, for society to integrate the rationale of separation which culminated in the mental representa- tion of an abstract money of account. In England, it took one century, the 17th, to integrate the rationale of equivalence which culminated in the system of convert- ibility.

During the 17th century, goldsmiths had got into the habit of taking specie deposits from merchants in return for receipts which then circulated as means of payment. But from repeated observation of ebbs and flows, which advances in the study of probability had made it possible to formalise as concepts, they became aware of the law of large numbers. They issued certificates, which became acknowledgments of debt, over and above their reserves of metal. In the dualist system, the goldsmiths speculated on monetary alterations and on the relative value of coins. They exported or imported the best coins according to whether dis- parities between official values and metal prices were increasing or decreasing, putting poorer quality coins back into circulation. This attracted a hostility which was to crystallise after the political revolution of 1688, since the goldsmiths were very close to the Stuarts, their debtors. The new government, of a liberal cast, was hostile to them. It was feared that the new government would not acknowledge its predecessors’ debts, casting doubt on the goldsmiths’ solvency. The situation was compounded by the war of the Spanish succession, which had begun in 1689 and considerably increased the Crown’s financial needs. The merchants needed a guarantee, which the goldsmiths could not provide, if they were to lend to the Crown. The situation created the conditions for a stabilisation which was to go much further, since it actually engendered a new monetary system.

The merchants created the Bank of England in 1694 and lent its entire sub- scribed capital of £1 200 000 to the king. The Bank could discount commercial bills and grant advances to individuals. It could issue notes up to the amount of its cap- ital which, though not legal tender, served as means of payment. The most vital institution of the forthcoming capitalist era had come into being. All that remained was to introduce the convertibility of notes so as to give it the sheet anchor of trust. Such was the unintentional consequence of Locke’s proposal to put an end to monetary disorder.

Since Elizabeth I’s accession to the throne in 1561, England had stopped mak- ing alterations to the pound sterling. The disorders of the 17th century had their origins in the goldsmiths’ exploitation of disparities between different types of coin. As a consequence, these disorders undermined trust in the circulation of notes. Deteriorating trust was exacerbated by the explosion of inflation in 1694-95, which augured ill for acceptance of notes issued by the Bank of England. Lowndes, the Secretary to the Treasury, reacted in the old manner, proposing a devaluation of the pound sterling. Locke, however, suggested cleaning out the entire metal- based system by withdrawing all bad coins and re-minting only high-quality coins corresponding to the statutory definition. The solution of deflating through mone- tary reform was widely imitated, first in England after the Napoleonic wars, then in other countries in the 20th century. Exchanging coins caused a loss of £2 600 000 to the state, but the chosen gold-silver ratio (15.9 compared with 15 in continental Europe) attracted an influx of gold into England, which became a *de facto* gold- standard country. However, the most important factor was the institution of a system in which a (private) bank issued a currency, trust in which was maintained by convertibility into a high-quality metal currency constituting a monetary base which was itself linked to the unit of account via a ratio decreed by the sovereign. As will be shown, this system paved the way for the spread of bank money and its organisation into hierarchical banking systems under the aegis of central banks. But it was not the end of the story.

#### The advent of the self-referential unit of account

Each of the monetary systems identified above has its own rules and political constraints in order to preserve the unit of account. The unit of account is linked to

the minting of metal in the system of Antiquity, separated by alterations in the dualist system, regulated by convertibility in the gold-standard system. Because money is the abstract form of exchange, the most general of social links, it absorbs the movement of societies with all their tensions. These tensions are themselves fuelled by the contradictory powers (for example between creditors and hoarders under the dualist system) which stem from possession of money. History teaches us that when societies change, pressures build up which become incompatible with the rules contained within a given unit of account system. Crises may there- fore arise within a system, such as the temporary suspension of convertibility in a standard-based system. There are also periods of recurrent crisis, or abrupt trans- formation, which result in a change of system. As we have seen, these changes take place along a path leading towards greater abstraction which seems to be characterised by increasingly rapid deterioration of the unit of account in periods of recurring crisis. The open question, to which history does not provide an answer, is whether the periods in which the unit of account is defined in a system inspiring trust get shorter and shorter.

However that may be, the convertibility system, which ultimately converged on the gold standard, did not withstand the turbulence of the 20th century, a cen- tury of concentrated, mass forces of both destruction and progress. These forces profoundly modified social structures, including those of claims and debts, and the monetary system is responsible for enforcing the contractual obligations aris- ing out of them in order to maintain trust in the unit of account. One form of conflict lies in the dissimilarity of obligations for which money is the vehicle: on the one hand, transfers resulting from political rights (deriving from war debts) or social rights (deriving from social debt), and on the other the collection of credits generated by capitalist projects. With the rise of wage-earning societies after the First World War and their generalisation after the Second World War in the most developed capitalist countries, a distributive economy based on social rights became entwined with a liberal capitalist economy based on private property. From this mixed economy emerged an economic policy in which the state con- trolled the level of overall output and how it was shared. The trend, irresistible after the great depression of the 1930s, resulted in the nationalisation of money. All links with gold were severed, in domestic payments before the Second World War, and in international payments in 1971.

The monetary system therefore consisted of national currencies: units of account defined in terms of the liabilities of issuing central banks. By detaching themselves completely from gold and silver, societies cast off all the symbolic lines that could still anchor trust in belief in a universal guarantor outside the monetary system. Money continued down its path towards a representation con- sistent with its essence: a social operator objectivised in number. The system which makes it work is an institutional construct, with an institution to define and measure, by convention, changes in the unit of account’s purchasing power over time, an institution to frame and implement strategies to control the economy through money, and institutions of public opinion and democratic authority to legitimise these strategies.

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Present-day monetary systems, unlike those of the past, have an almost per- manent capacity for transformation in interaction with society. Control takes prece- dence over the sovereign act of defining the currency. Released from the requirement of convertibility, private monetary instruments outdistance the fidu- ciary currency of the central institution on all sides. Beliefs in symbols of sover- eignty have yielded to conventional definitions of the units of account. Trust has shifted from a quasi-religious belief toward the critical acceptance of the institu- tional capacity of controlling the flows of money. In order to understand how this control is possible and what threatens it, we must consider the private aspect of monetary innovation.

### Money and payment technology: the advance of centralisation

Very little is known about how means of payment were used in the Babylonian era, then in the outskirts of the Persian empire, in the Phoenician cities, though they seem to have been weighed ingots or fractions of ingots. The invention of minted coins in the cities of Lydia in the late 7th or early 6th century BCE was a radical departure. It is closely linked to the institution of the monetary system, described in the preceding section, which enables the unit of money to be detached from the unit of weight through collective acceptance of the nominal value guaranteed by the sovereign and certified by the hallmark punched on the reverse of the coins.

Specie, in which soldiers were paid their wages, paved the way for the spread of payments by money for goods. Indisputably, the link between cause and effect is the opposite of the one postulated by the realist theory. Specie did not origi- nate in a spontaneous extension of trade. It stemmed from the sovereign mark which caused money to be accepted as a social abstraction. Gold or silver became a means of payment by the sign impressed on it. It gave goods the status of mer- chandise by the trade that its common acceptance generated. Trade determined economic value.

Throughout Antiquity, as we have seen, abstraction went no further than the sovereign mark impressed on the metal. Without a purely ideal unit of account there was no possibility of credit money, hence no banks or transfer by signature. Payment technology went hand in hand with the technology of metal extraction, metallurgy and the working of precious metals. Use was made of electrum, an alloy of gold and silver that is easy to work. Be that as it may, the development of means of payment in Antiquity and the High Middle Ages is a matter for numisma-tists. In this study, guided by an institutionalist view of money, the emphasis lies on the relations between changes in the monetary system and the invention of forms of payment. By this yardstick, the 13th century has no equal. With the bill of exchange, capitalism was invented.

#### The monetary inventions of the Middle Ages: bills of exchange and debt certificates

The bill of exchange was a private monetary invention brought into circulation by 13th century Italian merchant-bankers who were in trade with Islamic mer- chants among whom the bill of exchange was already in use. Because of the Crusades, monarchs and popes needed to transfer what for the time were very considerable means of payment from one end of Europe to the other. The efforts made by kings to establish their supremacy over national territories had dislo- cated the feudal system, causing the great monasteries to go into terminal decline and significantly weakening papal authority. Merchant cities, many of which had gained political independence from feudal overlords, thrived as trade links with the Near East were re-established.

All that is true. But in purely monetary terms, autonomous private currencies, as opposed to mere private debt, are possible only if they can be expressed in abstract units of account. As we have seen, these abstract units of account were created by the introduction of the dualist system. At the same time as the unit of account broke away from the sovereign monetary mark, making it possible for trading communities to create abstract units of account, the bill of exchange acquired autonomy with regard to specie.

The bill of exchange took two centuries to become a codified, uniform inter- national means of payment throughout Europe. It called for four agents: the drawer, the original creditor, the payer to whom the letter was presented for pay- ment, and the beneficiary of the payment, who was not necessarily the bearer. An obligation of the issuer in the form of a payment order, it could be used to settle trade debts or to lend money. As an instrument for transferring debt, it generated a private monetary dynamic that was at the origin of capitalism because, now that private agents were free to transfer debt between each other, it was possible to sell against future payment, to buy without being able to pay immediately. The private relationship between claim and debt could become the vector for capital to circulate without being directly dependent on a monetary authority, which could therefore no longer dominate all monetary functions. It had never been pos- sible for this relationship to develop in Antiquity. In Roman law, debts were per- sonal. They could not be assimilated to monetary instruments enabling others to release themselves from their commitments.

So the bill of exchange was a forerunner of bank money which would develop in the 17th century. As a payment order, the bill of exchange was addressed

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directly to the person responsible for making the payment. It was not in principle a transferable credit instrument, though it would become one by circulating in the international merchant community. When the bill of exchange became accepted as proof of a prior obligation, first in practice, then in law, it was itself a financial instrument. This legal status was not acquired until the end of the 15th century.

As the payment stipulated in the bill of exchange was to be made somewhere outside the drawer’s own monetary zone, it acted as an instrument of exchange between bankers. Use of the bill of exchange was therefore linked to long- distance trade, which it helped to foster. When trade is sufficiently extensive and diversified, trading companies have available funds in some places and payments to make in others. This lies at the origin of banks having correspondent banks elsewhere. When the resulting interdependence becomes multilateral, problems of clearing bills of exchange arise. Organising a clearing system was the way in which merchant bankers freed themselves as far as possible from the need for payment in specie and the arbitrary nature of official alterations ordered by mon- archs. In order to carry out these clearing operations, guilds of merchant bankers invented private units of account to evaluate bills of exchange accepted for clear- ing and to calculate net positions. Clearing remained periodic until relations between correspondents became sufficiently numerous and stable from one place to another. Clearing was carried out in the network of towns and cities which held fairs. It was the first organised international money market in which bills of exchange of different quality were evaluated and the conversion between them denominated in different units of account, in which arbitraging was practised, and in which net balances were carried over (to the next fair) or paid in specie.

The advent of the bill of exchange thus created the first form of centralised payment. It also entailed two types of exchange rate, side by side: rates for specie and rates for currencies. The differences could be very considerable, because rates for coins minted by different monarchs depended on alterations of official units of account, manipulations of the quality of the coins, and restrictions on minting and circulating them. Rates for currencies depended on the implicit incor- poration of interest over variable periods and the estimation of risks borne by merchants with differing reputations.

Thanks to centralised clearing and private international monies of account, transfers from one account to another meant that the currency exchange market could be organised so as to reduce its dependence on official monies. However, it was not entirely free of them. Currency rates quoted at fairs set future exchange rates, since a bill of exchange issued in the creditor’s currency was paid at a later date in the debtor’s currency. The exchange rate was defined as follows:

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Future exchange rate = Official parity ± Implicit interest rate ± Exchange rate risk

Hedging exchange rate risk became common practice among international merchants who maintained large-value reciprocal flows. Merchants forward-sold claims which represented the counterpart of their exports and bankers forward- sold the bills of exchange they bought, generating strictly financial relations that were at the heart of the foreign exchange markets. The tension between these currency markets and official monetary alterations were at the source of the problems of international monetary control that we shall consider in the last sec- tion of this study.

#### Bank money, the law of reflux and multilateral clearing systems

As we have seen, all the techniques of international finance were invented between the 13th and 16th centuries. But, as Braudel has so often emphasised, the most basic economic relationships, the exchanges of everyday life, hardly changed at all. Capitalism was born in Europe, then spread worldwide in the 16th century, long before its roots penetrated into and extended throughout domestic economic activity. As Marx pointed out, primitive accumulation predated the industrial revolution by several centuries.

As we saw in the previous section, the industrial revolution in England was preceded, by more than half a century, by a monetary revolution which ushered in the phase of convertibility. However, the monetary revolution itself resulted from the rise of a national, manufacturing-based capitalism in the 17th century. After the final financial collapse of the Habsburgs in 1632 and the end of their attempt to gain imperial sway over Europe, the emergence of rival capitalist nations became the dominant force in the economy. However, the formation of a unified trading area which was its foundation could not accommodate the extreme monetary instability that arose in the dualist system in the late 16th and early 17th century. State-driven manufacturing-based capitalism needed regular supplies of raw materials and a concentration of financial resources invested over the long term. The security of these investments and the needs of the public treasury combined to urge for the reduction of the enormous guarantees taken by creditors because of monetary uncertainty.

The Netherlands was the first country to explore the idea of banking, with the creation of the Bank of Amsterdam in the 17th century. But the full efficacy of the match between the banking principle of spreading risk and the principle of mone- tary convertibility did not become apparent until the 18th century in England. This match is expressed in the law of reflux. Banks issue notes or create deposits against their assets over and above their reserves of specie. Banknotes circulate as means of payment. Notes and deposits are convertible on demand in the metal coin which is the base currency. If the banking rationale is allowed free rein, as in the free banking theory, the monetary authority does not control the quantity of base currency. The government merely defines the unit of account by setting an official price for a weight of metal chosen as the medium for specie. Convertibility is the rule that validates bank money. The law of reflux is the process whereby convertibility limits the issuance of competing bank monies. It economises specie and verifies the quality of notes at one and the same time.

The theoretical difficulty lies not in the formulation of the law of reflux but in understanding the specific characteristics of the banking principle in finance. These characteristics mean that the law of reflux is fulfilled in the centralisation of relationships between interbank correspondents within multilateral clearing systems.

One erroneous interpretation of the law of reflux is the real bills doctrine. This argues that in order for means of payment to be acceptable, banks should issue them only against commercial bills whose status as safe collateral can be easily verified. If that is the case, the money does indeed return to the issuer for destruc- tion. But it also means that the loans have been made on the basis of public infor- mation and that they can equally well take the form of tradable securities. Thus, at most the real bills doctrine explains the existence of securities financial interme- diaries issuing acknowledgments of debt whose value depends on that of the assets held by the intermediaries. It does not in any way explain the banks’ historical role in the development of capitalism.

Banks are institutions which offer non-transferable claims combined with the provision of payment services. They invest in specific information, whose quality depositors are not able to assess. This asymmetric information structure, coupled with the network effects in the system of payments, implies, as being the most efficient relationship, that deposits are valued at par in units of account and are hence convertible at par into the base currency. This relationship came into its own in the second half of the 19th century when deposits became transferable by means of cheques. Cheque payments transfer deposits from one bank to another and create interbank positions. The law of reflux is the process whereby these positions are netted out and settled between banks.

If the daily bilateral balance between two banks resulting from the balance of the value of the cheques they collect had to be settled in cash, the law of reflux would be highly restrictive. The need for liquid reserves to meet the requirement would hamper the expansion of bank credit. That is why banks found it to their advantage to enter into co-operative arrangements to economise specie. These arrangements spurred an advance in payment technology by leading to the organi- sation of clearing houses. Multilateral clearing of interbank positions on the clearing house’s books with settlement of net balances is the seed from which the centralisa- tion of payments grew. It highlights the ambivalence of money, because it is a collec- tive structure whose cohesiveness derives from co-operation between competitors. Although it is to the advantage of all, this co-operation is not self-evident. If a single bank fails, the co-liability of banks subject to the law of reflux can topple them all into bankruptcy. That is the systemic risk associated with centralised payments. The contradiction was resolved by creating a hierarchical structure with the central bank as its keystone, acting as the bankers’ bank.

#### The advent of central banks and the security-oriented regulation of payment systems

A clearing house is a centralised organisation which introduces collective rationality into payment systems. Clearing houses appeared in the leading busi- ness centres of the United States in the mid-19th century, at a time when there was no central bank. But clearing houses were not content merely to economise specie and reduce the cost of cheque collection. They issued settlement certifi- cates on behalf of their members, who deposited reserves with them. At times of crisis, especially when convertibility was suspended, the clearing houses acted as central banks, as Goodfriend points out (1988). Transferring certificates was equiv- alent to settlement among their members. This higher status of settlement money gave the clearing houses hierarchical authority over their members: they were truncated central banks. The responsibility for preserving the integrity of pay- ments among the clubs of retail banks of which they were the centre led the clear- ing houses to guarantee the irrevocability of payments in return for the banks’ compliance with restrictive obligations.

Irrevocability guarantees that a collected cheque constitutes final payment for its beneficiary, even if the account on which it has been drawn has insufficient funds or if the payer’s bank does not have sufficient means of settlement. Irrevoca- bility means that the beneficiary’s account is credited immediately. Payment is guaranteed against default on the part of the payer’s bank. In order for this guaran- tee to be operative, all the members of a clearing and settlement system must collectively agree to cover the liquidity risk when one of them is unable to settle its net position with the clearing house at the end of the day. The clearing houses therefore assumed stringent regulatory powers in matters such as conditions of access to banking activity, capital adequacy requirements, reserve ratios, loss sharing agreements, monitoring of members’ financial situations by committees of experts, and penalties for non-compliance which could go as far as exclusion.

Irrevocability is therefore the principle on the basis of which a payment sys- tem can be conceived as an interdependent network. Because of irrevocability, payments mediated by banks superseded earlier forms. A hundred years during which banks became the key players in monetary economies led to the develop- ment of national payment systems and ended the fragmentation of means of pay- ment. But in order for this point to be reached in the 20th century, the limits of private co-operation had to be overcome by establishing the primacy of central

banks. Whatever their origins and legal status, central banks imposed themselves as the bankers’ bank in the payment system.

Curtailed collective rationality is ineffective where the public good is concerned, as was amply demonstrated in the United States in the second half of the 19th century. At the same period, the Bank of England was asserting its posi- tion at the pinnacle of the banking hierarchy. The system of convertibility was strengthened as a result, because liquidity crises could be overcome without the need to suspend convertibility. In contrast, in times of crisis private clearing houses preserved only their members’ internal payments. Excluding the other banks, they aggravated the crisis for peripheral banks whose debit positions had to be settled in specie. Thus, the American payment system became increasingly vulnerable with the use of bank money until the acute disorder of payments in 1907. Even though regional clearing houses circulated their certificates, withdrawals by depositors demanding conversion into gold spread throughout the entire country.

It is possible from the example of the United States to understand the essen- tial innovation which gave the principle of irrevocability the necessary scope to unify a national payment system, namely a central bank capable of providing an elastic supply of a single, unanimously accepted means of payment and of assuming the responsibility of lender of last resort.

The collapse of convertibility and the establishment of national systems of fiduciary money between the two world wars consolidated the primacy of central banks in two-tier banking systems. Central banks took up a position at the centre of payment systems to guarantee settlement, prevent systemic default, control the expansion of means of payment, set prudential rules and ensure compliance with them.

#### The present-day hierarchy of payment systems

National payment systems are interlocking networks of networks with the cen- tral bank as their fulcrum, because its liabilities are the ultimate means for settling interbank balances. This superior liquidity of central bank money is consistent with the definition of the unit of account in fiduciary money systems. The unit of account is the unit of measurement of the liabilities that the central bank causes to be accepted as money. Contrary to the arguments of proponents of the “legal restrictions” theory, this system results from an extension of the banking rationale and not the imposition of a rule by the state. The monopoly on issuing banknotes conferred on the central bank is indeed a legal restriction. But directly holding money issued by the central bank in the form of notes is not a logical necessity of the hierarchy of monetary instruments in fiduciary systems.

The characteristics of the wide variety of retail payment instruments are sum- marised in [Table 3](#_bookmark10). It can be seen that scriptural and electronic means of payment

Table 3. **Retail payment instruments**

Monetary features Fiduciary money Scriptural money Electronic money

Logic of CIRCULATION

and medium for PAYMENT

INFORMATION

associated with PAYMENT

LIQUIDITY

and SECURITY

Decentralised, mechanical and anonymous (physical transfer)

Perpetual for coins and notes (except for wear and tear) Sovereign mark Counting

Memory dispersed and extinguished with the transaction

Circulation of notes is equivalent to payment

The means of payment itself is liquid

Low level of security (susceptible to theft)

Centralised, arithmetical and personalised (transfer of book entries)

Ephemeral (cheque) Acceptance by signature

A cheque is a voucher. Memory stored in movements between accounts

Irrevocability means that payments can be guaranteed, but the payer’s solvency is not monitored in real time

Dissociated from the means of payment (cheques  accounts)

Protected

(except signature theft) Collective security against bank insolvency (lender of last resort)

Centralised by interconnection, electronic and personalised

Ephemeral (electrical impulse)

Electronic card or purse guaranteed by the issuer

A card is a certified voucher: signature by PIN code

With smart cards, the payer’s solvency can be monitored

in real time

Account identification from the card

Protected by code Collective security (lender of last resort)

have similar characteristics – centralisation of payments and personalisation of means of payment – which imply a structure that has fixed costs and increasing returns. Electronic money can dominate scriptural money because it is more effi- cient, having earlier value dates; because it can convey more information; and because it enables users to be identified with greater security. It may therefore be supposed that electronic means of payment could entirely replace cheques in the future. Coins and notes, in contrast, have the opposite characteristics to means of payment backed by organised networks: decentralisation versus centralisation, anonymity versus identification, liquidity in circulation versus liquidity on deposit, sovereign mark versus private signature. Of course, the electronic purse has some of the features of fiduciary money. Between two recharges it transports liquidity, since payments made with an electronic purse are not individually linked to a bank account. These payments are therefore decentralised to a certain extent. But an electronic purse is not anonymous, and the memory of payments is not erased at each transaction. It is linked to a bank account which is debited at each recharge. It must therefore be guaranteed by the issuing bank. Thus, it is not the medium of absolute liquidity, but depends on the security provided by the hierarchically organised payment system, which depends on the central bank.

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Electronic fund transfers have revolutionised large-value payments in the last thirty years. The interlinking of computers, the extraordinary increase in their capacity to store and process data, and developments in remote transmission techniques have enormously increased the payment flows generated by financial transactions. More generally, large-value payment systems may be divided into three categories: interbank fund transfer systems, settlement systems for transac- tions in financial instruments and derivatives, and multi-currency payment sys- tems. These high-value payment systems are in contrast with the low-value, retail payment systems considered in Table 3. It is within these high-value payment sys- tems that systemic risk is located, since the errors of judgement and the hazards which affect all economic exchanges are concentrated in their flows. More specifi- cally, high-value payments concentrate risks with a strong likelihood of becoming systemic. In contrast, high-value payment systems are liquid if they can transport large amounts quickly (value-time) and safely (guaranteed final settlement). This liquidity in the broad sense is threatened by the combination of several types of risk.

Credit risk arises when payment orders are used to make other payments before they have been settled. They are aggravated by time pressures. In particu- lar, the risks arising from interbank positions during a day may be incurred on very large debts. Liquidity risk in a narrow sense arises when the payment branch and delivery branch for an economic or financial commodity are not the same. When delivery has been made to the counterparty but the payment has not yet been made, there is a pure liquidity risk. In the interconnection of payments, there are two forms of liquidity risk induced by dissociation: time to settlement and desynchronisation of settlement (or Herstatt risk in multi-currency payments).

Secure payment depends on the organisation which assumes these risks in order to guarantee final settlement. As already mentioned, this presupposes that payment orders are irrevocable for the beneficiaries. Subsequent settlement by the central agent must also be unconditional. In payment systems where the cen- tral agent is a private institution, this unconditionality cannot be guaranteed, since the agent cannot create, out of nothing and in potentially unlimited amounts, the ultimate means of payment which is unconditionally accepted. That is why there has to be a hierarchy of payment systems, with net balances from private systems feeding into the higher system (or systems) that settle accounts on the books of central banks.

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Rising levels of risk led European monetary authorities to develop at least one high-value interbank payment system in each country, which is not only capable of processing multi-currency transactions but also both irrevocable and uncondi- tional, in order to contain systemic risk. These more secure systems, which handle central bank operations designed to implement monetary policy, were inter- connected within the TARGET system when monetary union took effect. In order to increase security still further, these exclusive systems were equipped with the most advanced information technology, enabling them to switch from end-of-day net settlement to continuous gross settlement.

Since the first days of interbank clearing, each bank’s net balances on the clearing house’s books were calculated and settled at the end of the day. Central banks assumed the liquidity risk on settlement. So as not to incur the inherent credit risk, they drew up strict regulations, including loss sharing agreements between members with solidly established legal validity, provision of collateral to the central bank to secure its lines of credit, and limits on daily overdrafts.

In guaranteed gross settlement procedures, interbank payments are pre- sented on a continuous basis and accepted after a check has been made to ensure that the payer can raise the necessary liquidity. For the central agent, the credit risk can disappear entirely. But when payments are rejected because of insuffi- cient immediate liquidity, a payment freeze can spread by contamination. In order to forestall such an eventuality, banks have to have large amounts of liquidity at their disposal. The central bank can provide these, by means of clever computer programmes that optimise the order of payments in a queue instead of rejecting them, and advances against very high quality paper provided as collateral.

The point to be borne in mind from this movement along a path towards the centralisation of payments is the dilemma between effective execution of pay- ments and the stability of the systems that organise it. Inventing a wider range of private means of payment does not undermine the central banks’ influence. On the contrary, it reinforces it because complex payments, ever larger volumes and shorter lead times increase systemic risk. Private arrangements are incapable of controlling this risk because it threatens trust in money at its most fundamental level: the definition of the unit of account in an unconditionally acceptable monetary instrument. That is why the integrity of payment systems is much more than a merely technical issue. It must be seen in the context of the control of the economy by money via the financial sector.

### Money and finance: the advance of control

We now have an idea of the forces that operate in monetary systems. The key- stone is the definition of the unit of account, general acceptance of which confers social validity. This acceptance is the token of collective membership of the same monetary zone as a result of which money is the general medium of exchange. It is money which turns trade into an interdependent whole: the payment system. Within this system, the tension between the two indissociable aspects of money – the social coherence of payment obligations and the private power to accumulate money – is expressed. This ambivalence develops over time in the form of a struc- ture of claims and debts. This structure – the financial sector – is the locus of recip- rocal dependence and rivalry between creditors and debtors. When rivalry gets the upper hand, the payment system may be disturbed and a financial crisis with monetary effects can occur. The aggravation of malfunctions, when they cast grave doubt over the settlement of debts, can lead to a general deterioration of confi- dence in money, or even a full-blown monetary crisis culminating in destruction of the monetary system.

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We can see, therefore, that the dual aspect of money, at once a collective rela- tionship and susceptible to private appropriation, renders any self-regulation of money by commerce utterly impossible. When we understand that money is the operator of economic value and not a particular object on which value is conferred by the fact of trading it, we also understand that money requires social control. This control is accomplished in and by the financial sector, since that is the place where the tensions surrounding money are concentrated.

We have seen, from our consideration of the advance of abstraction in the defi- nition of money, that several principles for establishing the unit of account have suc- ceeded each other in the course of history. The links between these principles, which lie at the heart of monetary systems, and developments in finance suggest that the ways in which money is regulated change with the two major historical trends identified earlier, namely abstraction and centralisation. This fourth section seeks to give some idea of what these changes are, and how they come about.

#### Private debt and dysfunctions in payment systems in Ancient Rome

The discussion below owes much to Andreau’s work (2000) on the financial cri- ses of the Republic in the first century BCE and the beginnings of the Empire (until 32-33). These crises have nothing to do with the definition of money. They are dif- ferent from the monetary crises studied by Carrier, which rocked the 3rd and 4th centuries until stabilisation in 360 and gave rise to successive reforms in an attempt to halt the depreciation of the currency and restore confidence.

The Roman currency was closely linked to the power of the state. The state had a monopoly on minting money; money does not seem to have been minted privately. The state had no debt. Money was issued through public expenditure, trade with the eastern Mediterranean, gifts from the state and the redistribution to the political elite of the spoils of war and levies on subject peoples. Conse- quently, financial crises did not undermine trust in the currency, or in the way it

was minted. On the contrary, these financial crises were private debt crises with deflationary effects, during which hoarding could paralyse payments. Trust there- fore had to be restored by acceptable compromises or imposed solutions for the settlement of debts. In all events, financial rivalries took a back seat to political struggles, including civil wars between 91 and 80 BCE, the Catiline conspiracy (64 to 62 BCE), the civil war triggered by rivalry between Caesar and Pompey (49 to 44 BCE), and acute indebtedness under Tiberius (32 to 33).

There are considerable differences between private debt in Roman times and private debt in post-13th century capitalism. In capitalism, debt creates private money which is issued with a view to accumulating capital. In Rome, debt was linked to political careers. Those seeking access to the upper strata of the social hierarchy had to acquire considerable assets, which could entail contracting sub- stantial debts with other members of the elite who had already achieved or inher- ited such positions. Political success was essential if the social climbers were to reimburse their debts and consolidate their fortunes thanks to the state sinecures to which such positions gave access. Struggles between creditors and debtors thus tore the Roman political elite apart. Debtors could gain the support of plebeians who were structurally in debt. The importance in the political arena of having assets meant that debtors resisted the sale of their estates, which would have caused land prices to fall, in order to settle their debts.

At times of acute political strife, financial crises could arise from a conjunction of circumstances, when a small group from the political elite monopolised the wealth of the state and the means of payment in circulation dried up. This could be caused, on the supply side, by insufficient state spending or a foreign trade deficit, but was more likely to result, on the demand side, from hoarding due to concerns about political instability. In this system, the relationship between finan- cial pressures and monetary malfunctions was expressed by abrupt changes in the velocity of circulation of money. Absorbing the debt crisis was the precondition for restoring normal payments. This could be achieved by violence, as was the case with Cicero in 63 BCE, following a refusal to compromise by rescheduling debts or partially reducing them in principal or in interest, or by gifts or low-interest loans from the state.

The crises of the Later Empire in the 3rd and 4th centuries were quite differ- ent. The 4th century was marked by rampant inflation until 360, preceded by a general crisis in society in the 3rd century. The structure of monetary creation changed after 215 as new coins were issued in line with successive devaluations and attempted stabilisations. Until 270, apparently, the pace of devaluations was reflected in the price of precious metals in terms of units of account rather than in the price of staple goods. Inflation came roaring back after the failure of Aurelian’s reform, interacting with currencies that had less and less metal content and circu- lated more and more quickly. Soaring prices prompted a reaction from private agents seeking a store of value. It is at this point that trust in the definition of money was lost. A split occurred between gold and the debased coinage in circu- lation. Gold and silver coins were treated as commodities sought after because they were an absolute expression of value. They became speculative objects, val- ued in terms of circulating money, which was increasingly rejected. The precondi- tion for stabilisation was the state’s capacity to push through a radical reform: requisitioning precious metals by weight, reimbursing them in debased coinage at a decreed tariff and re-establishing a system of monetary creation based on gold.

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#### Easy and tight money in the dualist system

Before the decline of the Empire, the prestige of the state governed the cur- rency in the Roman world. The ups and downs of political life, much more than economic life, were the cause of malfunctions in the monetary system. With the emergence of capitalism in the 13th century, monarchs and overlords had to reckon with the vigour of private finance. Merchant bankers wrested franchises and organised themselves into merchant cities in Italy, along the Rhine and in the Hanseatic ports. A string of fair towns completed the financial marketplaces where bills of exchange changed hands beyond the control of the political authorities.

The vigour of private finance was linked to the long-distance trade in which financiers invested their money. That is why periods of easy and tight money alternated according to the comings and goings of fleets in European ports. Let us take as an example the circulation of capital between Venetian merchants and Florentine bankers in the 15th century. When the fleet was about to sail, money was at its tightest in Venice. Specie was rare and bills of exchange were issued on Florence in order to finance the commissioning of ships and their car- goes. The excess supply of bills of exchange caused their price to fall. Conse- quently, the florin appreciated in relation to the Venetian ducat. In contrast, when the fleet returned, if there had been no losses due to storms or piracy, merchandise from the east flooded into Venice and was sold on throughout Europe. Northern European traders in turn drew bills of exchange on Venice to remit the counter-value of the goods they had bought. Venetian debtors could settle their debts with their Florentine creditors and the ducat recovered against the florin. Furthermore, interest was camouflaged in the exchange rate. As the Florentines were structural creditors of the Venetians, they received camou- flaged interest on their loans which, according to Einzig, ran at 8 to 12%. Floren- tine bankers received the interest in the settlement of bills of exchange in Florence on debt instruments issued in Venice.

These cyclical variations took place between two free cities that had continu- ous business relations, generating substantial volumes of bills of exchange which netted out over time and economised specie. The relations between private financiers and monarchs who altered units of account and manipulated the metal parities of minted coins to encourage or halt inflows or outflows of precious metals were more complex.

The monarchs’ monetary policies were hardly transparent. They sought to prevent exports of precious metals and to limit the circulation of foreign specie in their lands. They required the holders of foreign coins to take them to the mint, where they would be melted down and restruck with a metal content that gener- ated substantial seignorage. The level of these controls depended on how easy or tight the relative supply of specie was from one country to another. In the mid- 14th century, for example, merchants perceived the effect of the scarcity or abun- dance of specie in different places on scriptural exchange rates through gold points. These were very variable, however, because they depended on the strin- gency of export controls on precious metals and the financiers’ anticipation of the feared future mutations of the unit of account.

Let us then consider the contradictory effects of a prolonged tight period in a realm. The government tightens its restrictions on the export of precious metals and increases seignorage on the re-minting of imported foreign coins. The market value of gold therefore increases in relation to its official acquisition price at the mint. This widens the gap which determines the gold export point. But domestic hoarding is an initial obstacle to the government’s achievement of its aims. At the same time, as we saw earlier, the scriptural exchange rate of the local unit of account depreciates during tight periods. When specie is scarce, more bills of exchange have to be issued. As exports of bills of exchange are less strictly controlled than exports of specie, the scriptural exchange rate depreciates by more than the difference on the market value of the metal. When the scriptural exchange rate falls substantially below the gold export point, the advantage of paying in specie in another country is so great that the controls begin to spring leaks. Specie exports combine with domestic hoarding to shrink the available sup- ply of means of payment. The government then has to order a devaluation of the unit of account to encourage hoarders to put metal back into circulation and merchants to start importing foreign specie once more.

Thus, altering the unit of account was a crude way, brutal but essential, of reg- ulating the money supply in the early days of capitalism. It had the drawback of exacerbating conflicts between the nations that were beginning to emerge. In the 16th century, the kings of France sought to counter the depreciation of the livre tournois against the maravedi (the Spanish monetary unit) by making it more or less difficult, through more or less stringent controls, to transport precious metals from Spain to the Netherlands. Banning remittances caused a rise in the price of debt issued in Antwerp and Amsterdam, a depreciation of the Spanish scriptural exchange rate and ultimately a devaluation of the maravedi.

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Alterations of units of account therefore had all the features of modern competitive devaluations or revaluations. However, the aim was not to export unemployment or inflation, it was to attract precious metals. In doing so, they rewarded hoarders and increased the risk premiums hidden in scriptural exchange rates for debt. When capitalism began to take root, they became an obstacle to its further spread.

#### Monetary order and financial regulation under convertibility

As we saw earlier, the central issue of convertibility was the security of credi- tors. If accumulated capital is to flow through into the production of manufactured goods, it must be possible to assess the specific risks of committing capital according to the opportunities perceived by financiers. This differential assess- ment is based on the establishment of benchmark interest rates. Confidence in the workable stability of these benchmarks is the basis on which financial contracts are concluded and the structure of debt according to risk and maturity has evolved over time. Financial regulation by money is the process which generates the common good of stable benchmarks.

No other period in the history of capitalism seems to have maintained bench- marks stable for so long than the period of the gold standard between 1879 and 1913. It is doubtless on account of this that the period has been called the international monetary order. Flandreau’s research (1995) can be used to extend this period of monetary stability. He showed that bimetallism in France in the three decades prior to the war of 1870 was managed in a way that generated extremely solid trust in convertibility.

Let us take the pure case of a group of countries which define their unit of account by stating it to be convertible into gold. [Table 4](#_bookmark11) shows the very high level of confidence in the monetary order of the period, in contrast to the present day.

Short and long-term rates were much less volatile then than they are now, even though inflation is very low. The only exception is in the United States, for a well-known reason. The lack of a central bank in the United States under the gold standard generated a latent systemic risk which surfaced in recurrent banking cri- ses. The whole economy paid the social cost of a fragile banking system in the form of excessively volatile short-term interest rates. Long-term interest rates were also remarkably stable under the gold standard. Long-term interest rates on government securities provided a very solid anchor for financial investments. They expressed the great measure of collective security that this monetary system gave to capital investment. It is remarkable that the most stable rates were indeed nominal and not “real” rates. It is also noteworthy that the general level of prices was not a matter of concern. There was no official price index. Recent econometric studies using reconstructed price series show that price expectations were stationary,

Table 4. **Volatility of nominal interest rates (SD)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Period | United | Kingdom | France | United | States |
| LT | ST | LT | ST | LT | ST |
| Gold standard |  |  |  |  |  |  |
| 1880-1895 | 0.13 | 1.10 | 0.31 | 0.65 | 0.29 | 2.43 |
| 1896-1913 | 0.26 | 1.11 | 0.14 | 0.69 | 0.28 | 2.68 |
| Modern-day financial |  |  |  |  |  |  |
| liberalisation |  |  |  |  |  |  |
| 1980-1990 | 1.87 | 2.24 | 2.64 | 2.82 | 2.20 | 3.26 |
| 1991-1997 | 0.96 | 2.20 | 1.15 | 2.64 | 0.78 | 1.16 |

Short-term rates are rates for 3-month Treasury notes.

Long-term rates are rates for 10-year bonds for the modern period, and for perpetual loans in France and the United Kingdom under the gold standard.

*Calculations*: Aglietta *et al.,* MINI-FORUM (Paris X), *Les crises financières sous l’étalon-or et aujourd’hui, une analyse comparative*, Report for the CDC Institute, March 2000.

*Source:* NBER for the gold standard and IMF International Financial Statistics for the modern period.

despite the fact that short-term industrial prices fluctuated more than they do now. The business cycle was more marked and shorter. This provides us with information about how trust works in a system based on convertibility.

Savers in the countries that had gone furthest down the capitalist road seem to have been guided by ethical trust. They believed that the nominal promises written into long-term financial contracts would deliver the return that was expected when they were performed. Short-term price movements were therefore rightly seen as being reversible, and were hence not incorporated into long-term nominal rates. Under these circumstances, the monetary authorities had no need whatsoever to concern themselves with price stability. The only thing that counted was obeying the rule of convertibility, *i.e.*, preserving the unit of account. In addi- tion, the Banque de France, which had abundant reserves of gold, could allow itself to pursue minimum volatility in short-term interest rates, as can be seen from [Table 4](#_bookmark11).

This international monetary system was nonetheless vulnerable to financial crises, because the expansion of short-term credit in the business cycle reduced the banks’ liquidity. The convertibility requirement made discounting more expensive. The tightening of monetary conditions in which the law of reflux had to be obeyed forced the banks to limit their lending, accelerating the economic downturn. Recession did not necessarily always usher in an international crisis of confidence, but a financial accident occurring at a time of illiquidity could prove highly contagious. This was the case, for example, with the collapse of Barings in 1890, the panic in the banking sector in the United States in 1893 and the credit crisis in the “new economy” of the day in 1907.

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The Bank of England had to intervene in all these crises, lending gold to New York banks in 1893 and 1907. Certain situations, notably in 1890 and 1906-08, pro- duced a form of *de facto* international co-operation which was nothing less than the intervention of an international lender of last resort. The Banque de France pro- vided liquidity in support of the Bank of England to prevent short-term interest rates from rising too rapidly, because the existence of an integrated money market in the system meant that monetary conditions in France could not be isolated from the rest of the system. This pragmatic action at the source of the pressure, *i.e*., on the London money market, enabled the Banque de France to defuse the international liquidity crisis for the needs of its own monetary policy.

#### Predominance or subordination of monetary policy in national currency systems

From a brief review of the ways and means of monetary control in history it is possible to state the broad underlying principle. The aim is to maintain trust in the payment system, which mediates the interdependence of exchange and, beyond that, contributes greatly to social cohesion. Trust is threatened when uncertainty about the future of debt casts doubt on the durability of payments or the measurement of economic values on the basis of the unit of account. The first process is a financial crisis in which the reaction of economic agents to systemic risk can propagate the destruction of private wealth. The second is unchecked inflation, potentially leading to the loss of collective benchmarks without which economic agents are unable to make differential evaluations.

Regulation by controlling the money supply involves keeping the economy within a viable range between these pitfalls, so that the overall production of eco- nomic value is able to mobilise the resources of society as completely as possible. Controlling the money supply does not determine a single equilibrium, but a number of viable trajectories. Failures happen but they do not contaminate. Fluc- tuations that disturb prices occur in financial markets, but they remain transitory and reversible. Economic activity is subject to cycles, but it continues along an underlying trend which makes full use of resources.

As we saw in the second section, the great changes that took place in the 20th century freed units of account from the straitjacket of convertibility. The advent of self-referential national currencies shattered the monetary order of the gold standard, considerably extending and diversifying the areas within which national economies could be viable. But this shift did not take place without peri- ods of chaotic transition between the two world wars. In Europe and the United States, organised national monetary economies did not come into existence until the 1950s. The nature of international monetary relations changed because of the nationalisation of currencies. Under convertibility, they were the media for an ethi- cal form of trust which required monetary authorities to comply with the universal rule. International relations became a problem in all national currencies. In the last fifty years we have seen two major phases of monetary regulation, characterised respectively by the limitation and the flourishing of international relations.

National currencies modified the respective importance accorded to forms of trust. Hierarchical trust became the dominant form, because the growth of wage- earning societies generated powerful social forces which have not only rewritten politics but transformed the issues of democracy. The legislature has instituted social rights which in turn have provided a legal framework for the implementation of economic policies with social purposes that have their roots in common princi- ples of social progress. But their ambition has been reflected differently in eco- nomic policy objectives according to the scale and manner of state intervention in market economies. From American free market capitalism, in which the federal administration steers macroeconomic conditions, to the mixed economies of continental Europe, governments have weighted their objectives differently. To some extent, they each follow their own growth paths.

These developments have had considerable implications for money. In the first phase, from the early 1950s to the early 1970s, the Bretton Woods system pro- vided the framework for monetary control. An intergovernmental treaty, Bretton Woods sought to lay down rules of good conduct so that autonomous national pol- icies would not degenerate into the rivalries which caused conflict and fuelled monetary instability between the two world wars. The aim was to create plenty of scope for economic growth, in which each government could conduct its own pol- icy thanks to mutual recognition of the means for limiting the repercussions of one country’s imbalances on another. One of the most important of these means was acceptance of the legitimacy of controls on international capital movements. In the second phase, monetary disorders resulting from the collapse of the Bretton Woods system caused governments to seek salvation in a somewhat unusual combination of greater monetary nationalism and financial liberalisation. In turn, this explosive mixture stimulated innovation at an institutional level, since it caused a widespread movement towards the independence of central banks.

At the time of the Bretton Woods system, currencies were heavily dependent on the state. Monetary policy was used to pursue governments’ economic objec- tives. In compartmentalised financial systems, where interest rates on bank deposits were decided by governments and the deposits themselves were explic- itly or implicitly guaranteed by the state, the currency was relegated to an instru- mental role that the Radcliffe Report (Committee on the Working of the Monetary System, 1959) rationalised particularly well. The currency was subordinated to public expenditure and, in some countries, to the financial intermediation of pub- lic institutions. Until the late 1960s, the notion that the government was respon- sible for the nation’s entire economic policy went unchallenged.

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This is not the place to examine all the difficulties of monetary policy in a protected financial system under the aegis of the state. Let us merely identify the weaknesses that came under such heavy fire in the monetarist debate in the late 1960s. One of the two pitfalls threatening money, namely systemic risk, had been removed by financial regulation and by the certain knowledge that the central bank would cover up any incident in the banking sector. In this case, the supply of credit responds flexibly to demand as described by Wicksell unless the central bank imposes direct credit restrictions on the orders of the Treasury. The financial sector is biased in favour of borrowers. Investment projects are financed, growth sustained and business cycles cushioned. But short-lived and shallow recessions in oligopolistic banking systems encourage the index-linking of prices and costs. Trust in the unit of account is slowly eroded. Monetary policy is undermined by a surreptitious deterioration of the nominal anchor. Inflation spirals upwards as attempts to check it fail. Holders of nominal claims, espe- cially bank depositors, try to protect themselves against the devaluation of their assets. Insofar as the banking system fails to offer them any solution, mistrust spreads and translates into disintermediation. The search for ways of storing value generates growing pressure to liberalise the financial sector and open up access to international investments. Conflicts between creditors and debtors then become so acute that monetary policy is no longer able to set benchmarks for the evaluation of financial assets. Loss of confidence in the currency ushers in a phase of crisis and reform. This phase lasted for more than a decade, from 1968 to 1982.

Monetary nationalism and financial liberalisation were the twin offspring of the crises that followed the collapse of the Bretton Woods system. The breakdown of the code of international good conduct paved the way for floating exchange rates, and these in turn for individual governments’ monetary experiments to restore price stability at any cost. At the same time, private agents and govern- ments, depending on their circumstances, sought to obtain credit or to convert their nominal wealth in a wider lending and investment arena. The oil shocks exacerbated this trend and accelerated the formation of international financial markets.

The twist in the tale is the return of factors of instability that predated the introduction of convertibility, factors that were present in the dualist system. The first of these is exchange rate instability, *i.e*., relations between units of account which no longer have a standard of equivalence. The second is the uncertainty of international credit, which aggregates the risk inherent in financial intermediation and monetary risk. The third is the way in which the global financial sector passes on the effects of countries’ contradictory policies. Price distortions caused by exchange rates and financial crises have affected economies for the last twenty years or so.

In the financial environment of the last two decades, the pitfalls that threaten monetary policy have changed completely. Financial liberalisation has stimulated competitive forces which have boosted technological progress and set in train powerful, endogenous anti-inflationary mechanisms. These processes have enabled newly independent central banks to organise procedures for co-ordinating anticipations about the prices of staple goods and services, called inflation target- ing. Trust in the durability of the unit of account has been solidly re-established. But the other pitfall, systemic risk, has increased considerably. The challenge fac- ing this new century is that of how unco-operative national monetary authorities are to regulate a financial sector that is global, unstable, and a carrier of powerfully contagious forces.

### Conclusion: the prospective new forms of money

As we come to the end of this chapter, we now have a guide to help us assess emerging monetary innovations. We have seen that a threefold rationale of abstraction, centralisation and regulation can be used to analyse money over the very long term. While the first two highlight irreversible processes, an arrow of time, that is not the case with the third.

Abstraction concerns definition of the unit of measurement. These definitions are increasingly abstract, meaning that they are increasingly consistent with the essential characteristic of money, which is to be the pure form of exchange. This characteristic is expressed in a number associated with exchange: the economic value assigned to the objects of exchange, *i.e*, their price. Money is the operator which confers an exchange value tp. It is therefore logical that the path taken through history by definitions of the unit of account should culminate in self- definition. The unit of account is instituted by the sign which represents it, the mark of the issuing body.

But to define does not mean to preserve. If the unit of account is to be pre- served, it must be generally accepted in the interconnection of payment instru- ments within a payment system. However, these systems are shot through with tensions deriving from the ambivalence of money: the system must establish the coherence of exchanges, but payment instruments are created by the separate and contradictory acts of private agents. The centralisation of payments is the pro- cess that results from the dual aspect of money. Once bank money develops, cen- tralisation on the books of the institution issuing the unit of account is the only system that guarantees final settlement.

Unlike the two previous tendencies, control is not in the least progressive. As we have seen from studying the path taken through history by units of account, there are times of deteriorating trust when the unit of account suffers, undermined by inflation, and times when agents believe firmly in the maintenance of nominal values. There are times when the confrontation between creditors and debtors in the financial system generates a latent systemic risk and times when commit- ments can be honoured without difficulty. Financial crises have occurred for as far back as it is possible to observe the past. The permanence of money is therefore the permanence of ambivalence, which is indistinguishable from the permanence of social relations. There is nothing to suggest that control of money is leading societies towards greater cohesion, peace and harmony.

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This brief reminder helps to dissipate illusions and to raise questions about the new monetary technologies. The confusion engendered by futurist predictions derives from a misunderstanding of the nature of money, and especially of the interaction between the threefold elements of its underlying basis. The changes which electronic money is expected to bring about may be assessed by the yardstick of this threefold rationale.

#### Private units of account, a common unit of account

The growth of international financial transactions between private agents using electronic networks is a possibility which leads to the use of private units of account. However, a distinction needs to be drawn between three forms of private unit of account: index-linked systems, basket units of account, and units of account which are autonomous because they are linked to private payment systems. Only the lat- ter form has any monetary effects. Is it a radical innovation? Not really, because it is hard to see how it differs from the units of account used by 15th century bankers in systems for clearing and settling bills of exchange. Just as these systems sought to remain as far removed as possible from alterations of official units of account, net- work electronic money could make payments without using large-value interbank payment systems and the units of account on which they depend. But what is the result as far as relations between units of account are concerned? A clear distinction must be drawn between the functional autonomy of payments (which we will come back to) and identification of the payment zone by the unit of account.

In the 15th century, the units of account used by communities of merchants and bankers could not help but confront the question of equivalence with official units of account, because private systems cannot be entirely self-sufficient. This will be even more true in the future. If electronic payment networks spread, there will be many of them in competition with each other. If they do not, they will be taken over by the banks and will become merely another technological option for making payments; as they will not affect the centralisation of payment systems, they will therefore use national units of account and foreign exchange transactions. However, it is conceivable that cross-border private payment systems, being more efficient in the clearing and settlement of international financial transactions, could give rise to an agreement between major financial intermediaries and net-work servers which would create a universal unit of account in this type of transac- tion. However, any such innovation would not concern the bulk of payments that constitute economic activity.

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Being common is the core characteristic of a unit of account because it defines membership of the same monetary zone. Using a unit of account sets up a rela- tionship between each economic agent and the society of traders as a whole. It is not a contractual relationship between private agents. Providing a unit of account therefore amounts to providing a collective good. So-called “private” units of account are in reality collective goods offered within specific payment communi- ties. They must necessarily express the conditions of their equivalence in units of account defined by the undertakings of central banks, because it is these central bank undertakings which define the meaning of the words “dollar”, “euro”, etc. They establish the most general, and hence the most abstract, form of the social relationship. In order to be universally accepted, units of account defined by the liabilities of other issuers must prove their equivalence with units of account that are superior collective goods. Consequently, private agents who enter into con- tracts in these units of account, which are inferior collective goods, bear costs and take risks. If these costs and risks are to be offset, the payment systems based on these inferior collective goods must be more efficient. Can that be the case?

*Retail payments: the electronic purse does not have the edge over fiduciary money*

The forthcoming innovation in retail payments is the electronic purse. Of course, funds which are stored in this form are expressed in the unit of account linked to the money issued by central banks. But if the electronic purse were to replace fiduciary money entirely, it would contribute to the eradication of the last symbolic pillar of trust. The hierarchy of collective goods, which remains the prin- ciple that lies behind monetary abstraction, would no longer be sustained at all by the effigy of sovereignty. But [Table 3](#_bookmark10) shows that the electronic purse does not have the edge over fiduciary money, since fiduciary money offers non-pecuniary advantages of liquidity, anonymity and security that the electronic purse does not have. The electronic purse may be used instead of fiduciary money in certain lim- ited cases, but is not likely to replace it entirely. The electronic purse is more likely to occupy a position between fiduciary money and existing means for trans- ferring money between bank accounts in order to extend the range of means of payment. In all events, it will have no impact on the regulation of money.

*Network electronic money or cybermoney: the illusion of a radical change in the centralisation of payments*

As we saw in the third section, the corollary of the development of private means of payment was the centralisation of payment systems under the aegis of

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central banks. Why should things be any different with the appearance of “real” electronic money? Payment systems which make settlements on the books of cen- tral banks have a nullifying competitive advantage. They are the only systems that can guarantee final settlement, *i.e.*, irrevocable and unconditional payment. They can do so because the settlement agent (the central bank) presents no default risk and acts as lender of last resort to the members of the system to stop chain reac- tions resulting from payment incidents or unforeseeable liquidity shortages (for example, a computer failure at the Bank of New York in November 1985 caused the Federal Reserve to inject $ 25 billion into the Fedwire payment system before the end of the day). In return for these advantages, the central banks are autho- rised to regulate the system and admit members into it. Of course, private sub- systems exist which reduce costs by not according these advantages, but the cen- tral agents of these sub-systems are themselves members of at least one payment system supervised by a central bank, so that unsettled net balances flow onto the books of at least one secure payment system.

Could things be different in the future? Believing that to be the case demon- strates a profound misunderstanding of the nature of liquidity. Liquidity evapo- rates when trust collapses. But trust cannot be an entirely routine or actuarial matter in payment systems, because monetary flows within payment systems become extremely unstable as soon as doubt arises about the settlement of a large-value payment. Liquidity can be preserved in all circumstances only through a hierarchical guarantee, offered by a socially recognised and unconditionally accepted currency.

It is true, however, that payment technologies will change. The payment sys- tems currently operated by bank oligopolies are highly inefficient, giving three- or four-day value dates for cross-border payments. The cost to customers is suffi- ciently great to generate competition from payments via electronic networks. Elec- tronic money issued by non-banks circulates between computers on the Internet. This money lies outside the banking system and gross flows can increase very rap- idly with the number of agents online. The profit opportunities and risks increase just as rapidly in such unregulated systems, because the conditions for converting the net cybermoney amounts acquired by the beneficiaries of payments into bank money are uncertain. They depend on the cybermoney issuers’ reputation for meeting their commitments. But this reputation would be more than doubtful if electronic money were entirely deregulated and open to unchecked competition between issuers who would not have the option of turning to a lender of last resort.

This sort of science fiction vision of the future has no chance of coming true. The historical process of centralisation will also apply to electronic money. Non- bank agents such as large network servers and large telecommunication compa- nies may become issuers of electronic money because they can offer efficient payment services. But they will be regulated and will have to prove their capacity to apply the principle of irrevocability by joining the payment systems run by central banks. Increasing the complexity of the hierarchical system offers an alternative to the direct incorporation of electronic money into existing payment systems. In this case, non-bank issuers of electronic money would have mandatory links with banks which would act as their lenders of last resort, and the retail banks would be accountable for their reputation.

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The fevered imaginations of the futurologists have come up with another sce- nario, according to which issuers of electronic money would offer economic agents payment services that were more efficient than those of banks, especially for long- distance payments. However, they would use safe market assets to settle their reciprocal debts. In order to ensure the certainty of final settlement in the absence of a lender of last resort, all debt would have to be securitised, secondary markets would have to work round the clock and individual payments would have to be settled gross, transaction by transaction. This would be tantamount to the most extreme form of centralisation: a single global clearing house with no lender of last resort, operating on an irrevocable gross settlement basis! The cost of setting up such a system would be astronomical, involving both the destruction of existing systems and the construction of a new one. Leaving aside the fixed cost – and in whose interest would it be to pay for it? – the system would be exposed to liquid- ity risk, if not credit risk. The absence of a lender of last resort inevitably leaves the payment system vulnerable to log jams in the gross settlement system caused by unexpected variations in liquidity. It would therefore be more expensive for end-users than the systems run by central banks, since in order to work properly it would require more extensive reserves of the chosen means of payment. Building up these extensive reserves would generate opportunity costs that would inevitably be passed on to customers.

*Whatever form the centralisation of payments may take, the control of money will remain in the hands of central banks*

In modern economies with abstract units of account, monetary policy depends neither on fiduciary money nor on compulsory reserves. It is based on setting interest rates. As Keynes pointed out, there is a close and essential link between the institution of the unit of account and the role of the nominal interest rate as the lynchpin of financial evaluation. In an economy where money is the general form of exchange, there are no relative equilibrium prices, hence no real equilibrium interest rates that are independent of monetary policy choices. Money is never neutral. That means that the money market does not converge on some fundamental equilibrium interest rate in the absence of central bank inter- vention. The central bank defines the benchmark for all financial evaluations, the focal point on which private anticipations are concentrated. The most basic reason is that the unit of account defined in terms of central bank liabilities is the supe- rior collective good. It is in this unit of account that financial contracts may be defined with the minimum of risk. In consequence, it promises future payments under the terms of those liabilities.

In any payment system where final settlement is made on the books of a cen- tral bank, the central bank determines the money market rate by setting a band between the rate at which it accepts deposits on its books and the rate at which it lends its liabilities in an emergency. As a sovereign monetary institution, it can steer interest rates according to broad considerations for preserving the unit of account. It is because the central bank does not have to seek to maximise its prof- its that it can exercise power over agents on the money market.

Even in the hypothetical case where settlements were made exclusively in market assets, the central bank could still steer the rate for such securities into a band by accepting overnight deposits and granting credit at its own rates. If the money market rate falls below the deposit rate, settlement creditors will prefer to sell market assets in order to acquire central bank deposits. If the money market rate rises above the central bank lending rate, settlement debtors will prefer to borrow from the central bank. The central bank will finance this lending by auto- matically increasing its own liabilities. In none of these cases will monetary regulation be compromised by the impossibility of settlement.