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What is the complementarity among monies? An introductory note

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I

'The market makes its money', thought Hicks,[1] and similar messages have been delivered by many other thinkers on money.[2] However, while students of money have mostly been concerned with who could or should produce it, the market or the state, few have questioned whether the money itself should be single or not. Apparently it has been taken for granted that a single market and a single money should coincide. Nevertheless, contrary to the modern assumption that one single currency should operate in one country, the history of money has been full of plurality until recent times, as we will argue in this issue. It is no exaggeration to say that the majority of human beings through most of history dealt with concurrent currencies. It is important to recognise that, in most if not in all cases, the coexistence of monies was not incidental but functional, since they worked in a complementary relationship. That is, one money could do what another money could not, and vice versa. In other words, an assortment of monies could do what any single money could not, and supply what the market required. In the following articles we will show how this worked.

The assumption of mono-money has not always been made without any reservations. Hayek insisted that monies could work concurrently and should be made to do so, and his argument was supported by Klein.[3] However, Hayek's

[1] The articles in this special issue have been produced through discussions in three workshops and a conference session under the title 'Complementary Relationship among Monies in History' held at New York University on 17 December 2005, at the University of Tokyo on 24–25 April 2006, at the University of Helsinki on 25 August 2006 (14th International Economic History Conference), and at Ecole Normale Supérieure, Paris, on 13 December 2006. We wish to thank all participants of the four meetings for making numerous suggestions.

[2] J. R. Hicks, *A Market Theory of Money* (Oxford, 1989). Hicks was so flexible that he admitted the possibility that liabilities were expressed through more than one sort of money, even though it appeared to be complicated (p. 61). Marx thought that the money was not produced by any observation or agreement but was formed by instinct through the process of exchange. K. Marx, *Zur Kritik der politischen Ökonomie* (Berlin, 1961), S.35.

[3] F. A. Hayek *Denationalisation of Money* (London, 1976); B. Klein, 'The competitive supply of money', *Journal of Money, Credit and Banking*, 6.4 (1974).

insistence was conceptual, following his principle that money should be denationalised. He almost completely ignored the behaviours of concurrent monies that had actually existed in history. Meanwhile, Cohen and Helleiner recently made clear that a single currency within a territory was not a natural state for money, but an artificial product of modern history. However, what caused a variety of monies to exist concurrently in markets was not within the scope of their discussion.[4] Important but overlooked so far is the fact that, unlike the conceptual market in theory, actual markets in history might have been in need of plural monies. Fluctuating concurrent monies may have appeared to be in a state of chaos according to modern concepts, but there might in fact have been a coherent order behind the apparent confusion.

II

In fact, the difficulty of moulding the mono-money assumption into history has been noticed by some economic historians in the context of the denomination problem – the instability between small monies and big monies. The 'big problem of small change' was hinted at by Cipolla and newly revisited by Sargent and Velde.[5] Redish made clear that many currency problems lay in the difficulty of supplying a sufficient quantity of low-denomination coins, for which production costs per unit were inevitably higher than for high-denomination ones. It seems sensible to assume that machine-made coins enabled the issuance of small money at low cost and helped to prevent counterfeits, and consequently led to standardising small coins subsidiary to the standard unit.[6]

However, though in some countries this technology-oriented interpretation appears to be applicable, in others, such as early twentieth-century China, mechanical innovations neither successfully fixed small-denomination currencies to large ones nor halted forgery.[7] Global comparisons, which we will make in this issue, make clear that whether the monies were compatible according to their face values was little influenced by changes in technology. Thus, we need to find another answer applicable to the worldwide problem of the denomination instability which could

[4] B. T. Cohen, *The Geography of Money* (Ithaca, 1998); E. Helleiner, *The Making of National Money: Territorial Currencies in Historical Perspective* (Ithaca, 2003).

[5] C. Cipolla, *Money, Prices and Civilization in the Mediterranean World: Fifth to Seventeenth Century* (New York, 1967); T. J. Sargent and F. R. Velde, *The Big Problem of Small Change* (Princeton, 2002).

[6] A. Redish, *Bimetallism: an Economic and Historical Analysis* (Cambridge, 2000). We follow her emphasis that 'The monetary system of a market economy needs to provide a medium of exchange for a variety of scales of transaction' (p. 39).

[7] 'Then come subsidiary silver coins fractional to the dollar, but subject to a fluctuating rate of exchange such that the dollar may this year change for 110 cents and next year for only 95 cents in small coin.' H. B. Morse, *The Trade and Administration of the Chinese Empire* (London, 1908), p. 167. The Shanghai Museum exhibits a mechanical minting machine unearthed from an early twentieth-century counterfeiter site in Shanghai. For the fluctuating monetary situation in modern China, see A. Kuroda, 'The collapse of the Chinese imperial monetary system', in K. Sugihara (ed.), *Japan, China and the Growth of the Asian International Economy, 1850–1949* (Oxford, 2005).

not be solved simply by ample supply of uniform small monies. We will focus on the conditions within which currencies circulated, not on those of their production.

An examination of 36,000 coins of each subsidiary denomination sampled from banks in the USA during the early 1960s revealed that for unaccountable reasons subsidiary coins equivalent to 600 million dollars had disappeared from the currency that had been minted over a period of 50 years. Meanwhile, the total withdrawal of worn coins amounted to 9 per cent of the total output during the same period.[8] It turned out that, in addition to official disposal due to physical damage, the unaccounted loss of coins amounted to 2 per cent of coins minted per year in all denominations. That means that 2 out of 100 coins disappear year by year for no identified reason. More interesting to our topic is that the rate of the loss in the smallest coins was twice as high as that of the highest-value subsidiary coins. Similar tests in Britain in the 1960s obtained almost the same results, which, based on a 1968 survey, estimated the annual wastage rates of the halfpenny, one penny and one shilling respectively at 3.7%, 2.2% and 0.4%.[9]

Even with the development of banking systems which would effectively serve to collect idle currencies in their deposits, 2 per cent of coins became invisible every year. In addition, the smallest money evaporated faster than bigger money. This modern experiment gives us an important clue as to what monetary circulation might have been like before the establishment of banking systems. In premodern societies a significant proportion of currencies might annually become inactive. This assumption is not contradicted by numismatic studies on the relationship between the contents of hoards and mint issuance.[10] In other words, even without any increase in trade, some amount of money had to be supplied additionally every year. Otherwise, trade would have shrunk due to lack of money, since the currencies circulating in markets were not always current but sometimes became stagnant in sinks. However, more important to our issue is not the behaviour of a currency in general, but of the smallest monies in particular, which must have stagnated to a greater extent than larger-denomination monies. Looking at it from another angle, we can take it that, even in a single market, the velocity of one currency might have been different from another currency. If so, why could the diverse velocities not converge?

[8] The total output of subsidiary coins during the period was around 17 million dollars. C. C. Patterson, 'Silver stocks and losses in ancient and medieval times', *Economic History Review* ser. 2, 25.2 (1972).

[9] R. G. de Glanville, 'The numbers of coins in circulation in the United Kingdom', *Studies in Official Statistics, Research Series* no. 2 (1970), p. 4.

[10] The contents of a Swedish hoard containing 18,217 coins from 1624 to 1741, to an astonishing extent, follow the movement of annual issuance of the Swedish Royal Mint, but there is a clear tendency that the older the issuance is, the higher the loss rate. Bengt Thordeman, 'The Lohe hoard', *Numismatic Chronicle* ser. 6, 8 (1948). The recall of old coins for recoinage was negligible in this period. In their article in this issue, Engdahl and Ögren show that the Swedish economy would become dependant mostly on paper monies. I thank Mark Blackburn for bringing my attention to this article.

Here, in order to seek an answer, we are going to advance the denomination problem into a broader perspective, ranging across the spatial and temporal aspects of monetary circulation. These aspects have been almost overlooked in previous studies of monetary history.[11]

III

The following articles share a focus on the different spaces within which monies were used. Through this issue, the urban and the rural will indicate spheres that adjusted the demand for and supply of money in different ways. Rural areas were not always where money was rarely used. And even if the usage of metal money was rare this did not mean that exchange in the rural areas was uncommon. A more important dissimilarity to urban areas is that rural users of money were more geographically dispersed. Considering the unaccountable loss of coins mentioned above, it might be safe to assume that a higher proportion of currencies pouring into villages disappeared than those remaining within the cities. Another significant difference from the urban areas is the temporality of rural monetary usage. We will confirm in all cases that, to a greater or lesser extent but with no exception, the harvest season was the peak of monetary usage, while currencies were inactive in the slack season. The longer intervals of inactivity in the rural market must have prevented a higher proportion of currency from returning to business than in the urban.

Whether in the city or the village, seasonality seriously affected trade before industrialisation, and even after it. The agricultural product cycle is not the only factor that introduced a seasonal bias. For example, the rotation of the months suitable for transportation, such as the dry season in Ethiopia (Kuroda) or the frozen season in Sweden (Engdahl and Ögren), also brought temporality to business. We can assume that, if those temporalities could not be easily synchronised, one seasonal factor might cause people to hold one currency on standby while another seasonal factor might make them keep another currency against the busy season. In this case they might be encouraged to keep two sorts of currency concurrently.

Naturally space and time are not always independent of each other. If a zone and a temporality, such as a market consisting of several villages and a cycle of trade driven by the millet harvest, make a pair, the pair might create a money suitable to be held for its particular demand. Then, unless the local market is completely isolated, trade beyond the locality will require another money for transregional transactions. It might be quite natural for the latter money to consist of more large denominations than the former. If there were no effective adjustment for transcending plural zones, the exchange rates between big money and small currency would be unstable. Thus, considering both spatial and temporal aspects of monetary circulation, we can

[11] A recent exception linking concurrent currencies to the spatial issue is L. Fantacci, 'Complementary currencies: a prospect on money from a retrospect on premodern practices', *Financial History Review*, 12.1 (2005).

see that the market can make plural monies, and that those monies can work as complements to, rather than substitutes for, each other.

So far, the state has not been invoked to explain what the complementarity among monies is. However, this does not mean that we exclude the influence of the administrative power from consideration. On the contrary, the state is an important player in creating a complementary relationship among monies. The collection of taxes seems to have brought serious seasonal bias in monetary demands (Kuroda; Engdahl and Ögren). Military campaigns definitely caused large movements of currencies over short periods. Such actions might trigger complementary measures to avoid panics due to the sudden shortfall of currencies. A dichotomy between the market of voluntary choices and a state enacting forced regulations does not shed any light on the actual history of money. It must be a combination of the two that can make sense of the behaviour of monies. However, it is worth noting that the complementarity between monies can be described only by studying the activities of markets.

In the following four articles, first of all, we take the view that the complementarity among monies reflects diversity in demand for money in actual markets. The instances in Asian history discussed by Kuroda, in particular the Chinese cases which relied on small-denomination currencies more heavily than other regions, clearly show the difference in monetary demand between upper-level and lower-level markets and the difficulty of synchronising the heterogeneous behaviours of currencies. Kuroda particularly insists on variations in different currencies' propensity to assemble. He argues that this was due not to worn-out coins or their export but rather to the separation of stagnated streams of currencies, which behaved differently enough to make the denominations unstable. Under the circumstances a trade circuit and particular currency would be associated, and the exchange rates among monies could not be fixed. According to particular situations, the local assortments of currencies changed their compositions from time to time. Though they appeared to be lacking an institutional base in the modern sense, they were able to stabilise trade in contemporary terms.

The viewpoint from diverse velocities in monetary circulation gives us a hint towards a solution to a 'mystery' in monetary history – that of imaginary money. The standard formula in the modern period presumes a trinity of metal currency, unit of account and material content. However, the unit of account could in fact be detached from currency and also from material quantity. Monetary problems always appeared in the fluctuating relationship between a unit of account that could be imaginary and a currency that was actually handled, as Wolters and Fantacci will discuss. Given both a low propensity to assemble of currency (or inelasticity of its supply) and variety of monetary demand, the detachment of a unit and a substance was a reasonable way for local markets to avoid a sudden liquidity famine.

States or cities heavily dependant on interregional trade in particular had a tendency to make use of a monetary unit detached from current coins for domestic transactions. However, what would happen if such a state extended its rule to a region whose endogenous monetary system was completely different? The contrast between the

Dutch Republic and the Netherlands East Indies discussed by Wolters outlines a typical case. When the first Dutch fleet reached Java at the end of the sixteenth century, they found a world of highly fractional coins and no territorial state controlling the out- or inflow of currencies. The lead coins the Dutch encountered then were so cheap that 12,000 to 13,000 pieces were equivalent to one Spanish silver coin.[12] The Dutch introduced a unit of account of their own, consisting of the stiver and the guilder (20 stivers), and set the value of current silver coins, for example, the Spanish piece of eight was set at 48 stivers. However, the value of current stivers was enhanced in the transactions, and consequently a 'heavy money' of 60 stivers and a 'light money' of 75 stivers emerged. The experience of the Dutch Republic and its colonial Netherlands Indies suggests that the relationship among monies depends on what actual markets demand. In each case it was a product of a complementary relationship among monies for the purpose of neutrally measuring values, but a big gap emerged between the home country and its colony in the usage of money. A variety of currency in circulation and stronger demand for small-denomination money for local products brought the coexistence of a 'heavy' unit and a 'light' unit into being in Java.

As Fantacci revisits, however, early modern Europe likewise could not escape the issue of heterogeneous demand for money. Mono-unit currency, pence, had been dominant in Europe before various currencies equivalent to multiple units, such as the shilling, appeared after the thirteenth century. From then onwards, the proportion of net precious metal weight between multiple-unit coins and mono-unit coins had great difficulty matching the denomination of both types of coins. Fantacci's interpretation is that, given the insufficient metal supply, the debasement of mono-unit currency was inevitable to avoid a possible deflation, which is why the exchange rates between large coins and small coins through time changed always in the direction unfavourable for the latter. Fantacci calls this tendency structural debasement. His interpretation coincides with the higher rate of unaccountable loss of small coins from circulation noted above. Fantacci's article suggests that, unlike Asian cases in which rural areas demanded small coins, the appreciation of large coins in terms of mono-unit coins which occurred continuously in Europe can be taken to show that small monies were not so attracted to the rural market as to appreciate in value. Rather, transactions in lump or long-term contracts between the urban and the rural were usually made in large-denomination money.

If fluctuating relationships among currencies was so common in history, where did the compatibility among monies come from? A standard formula could not emerge without synchronisation between currencies consisting of widely ranging face values. It is important that the complementarity among monies did not always work in the same way, even under the same sovereignty such as the Dutch Republic and its colonial Netherlands Indies (Wolters). In contrast with the Asian cases discussed by Kuroda, merchants in early modern Europe did not have a strong tendency to make their own money

[12] J. C. Mollema, *De eerste schipavaart der Hollanders naar Oost-Indië 1595–97* (The Hague, 1935), p. 211.

incompatible with official money domestically, even though internationally they made their money beyond the authorities' territories (Fantacci). The heterogeneities were different, and brought about different results.

Neither did the compatibility among monies result from industrialisation, or from any technological innovation, as Engdahl and Ögren show. Compatible (though not always so) paper monies in nineteenth-century Sweden operated in tandem with lump transactions in rural areas, the development of remittances through postal services, and usage of stamps in place of small coins. All of these factors suggest less dependency on spot transactions, especially with small-denomination currencies. However, even such an almost compatible system without actual standard bullion must have been accompanied by multiple circulations of plural paper monies, such as a central bank's notes and local private banks' notes. Detailed analysis of remittance by post reveals what monies were actually sent in nineteenth-century Sweden. An interesting result of this study is that the issuance of local banknotes responded to seasonal demand for money. Thus one paper money did what another paper money failed to do sufficiently.

Introducing the difference between China and Japan, Kuroda insists on a gap between incompatible currencies and compatible currencies by plural issuers, but the findings by Engdahl and Ögren suggest that many cases of paper money usages in history await revision from the complementary viewpoints. For example, a similar division of labour between notes issued by the Country Banks and those issued by the Bank of England was also known in early nineteenth-century England. Nearly half of the total value of the latter consisted of notes whose face values exceeded 10 pounds while the former consisted almost entirely of notes not exceeding 10 pounds.[13] Though they were compatible, the Country Bank notes appeared to supplement what the Bank of England notes could not sufficiently supply to meet local demand. The difference not only in denomination but also the sphere in which the currencies circulated might require different suppliers with more flexibility to local demands.

The division of function even between paper monies leads to the inevitable conclusion that the money in actual markets is accepted neither according to intrinsic value nor by extrinsic regulation. This observation coincides with what Engdahl and Ögren primarily aim at in their article. The almost universal presence of currency circuits, the coupling of a trade zone and particular currency in Kuroda's terms, tell us that, rather than intrinsic contents or governmental orders which might enhance the valuation, traders' agreements – either explicit or implicit – did much more to endorse a money's value. However, the cluster of traders who could make and share these agreements might fluctuate over space and time. That is why the assortment of currencies differed locally and changed chronologically, and some currency circuits overlapped enough to appear chaotic.

[13] T. Joplin, *An Analysis and History of the Currency Question* (London, 1832) in D. P. O'Brien (ed.), *Foundation of Monetary Economics*, vol. 6: *Monetary Non-Conformists* (London, 1994), pp. 191–2.

IV

With the concept of complementarity among monies the classical arguments about the relationship between the natural economy and the money economy can be interpreted in a different light. As Bloch showed in examples from medieval Europe, the replacement of payment in terms of metallic coin by particular goods, or sometimes by certain days of work, was not uncommon in history.[14] As mentioned above, we don't follow the traditional assumption of a dichotomy between the urban as money economy and the rural as natural economy. The difference between the urban and the rural lay in the temporality of exchange, the spatial dispersion of traders, and the denomination suitable to transactions. There would not be so large a gap between a payment by a certain amount of rice in terms of a silver unit and a payment by certain pieces of copper coin (or certain sheets of paper money) in terms of the silver unit. In other words, whether the payment appeared to be monetary or not is of little significance. What is significant is whether their relationships were substitutive or complementary. Under certain conditions, rice in a sack could be used as currency to substitute for copper coin at a local fair, while, under other conditions, the payment of rice in the sack in daily transactions could be in tandem with the usage of copper coin available for distant trade. To put it simply, the idea of complementarity reveals the explanatory ineffectiveness of distinguishing between the natural economy and money economy.

Using the concept of complementarity among monies to find the reasons for the detachment between the currency, the intrinsic material and the unit of account, also invalidates the concept of mono-function money.[15] It is true that a currency may have a particular attribute of its own. For example, copper cash or shell money (cowries) was too bulky and fractional for long-distance trade, while gold was too precious to accommodate daily transactions. However, this never meant that copper coin was not accumulated as assets or that gold was not actually handed over in payment. The neglect of the division of labour among monies has led students of money to conceive an evolutionary path from a mono-function money to a full-function one, or, more explicitly, from imperfect money to perfect money. However, if we are right in insisting that the complementarity among monies should result from the combination of diverse demands for money and uneven flexibility of currency supplies, it was the market rather than its money that changed, regardless of whether it evolved or not.

There can be no doubt that the inflexibility of the currency supply must also have been made up for by credit supply. Here, however, we do not have sufficient space to add another focus, though we will touch on the importance of local credit for easing seasonal monetary tensions.

[14] M. Bloch, 'Natural economy or money economy: a pseudo-dilemma', in *Land and Work in Medieval Europe*, trans. E. Anderson (London, 1967).

[15] Mono-function money has been discussed particularly in African Studies. P. Lovejoy, 'Polanyi's "Ports of Trade": Salaga and Kano in the nineteenth century', *Canadian Journal of African Studies*, 16.2 (1982).

All in all, revisiting money from the complementary viewpoint leads us to a reconsideration of what the market is. The belief that, with no intervention in the market, arbitrage should work to converge plural monies into a single one led to the simplistic conclusion that the existence of concurrent currencies represents a backwardness in market activities and/or the imperfection of money which caused traders to suffer from large transaction costs. This negative observation almost coincides with what contemporary scholars or practitioners called the chaos of the native monetary situation in Asia and Africa, as both Kuroda and Wolters touch on. However, the concept of complementary monies suggests that, unlike the conceptual market, actual markets in history were anything but a mechanism bringing about a single equilibrium by itself. It is worthwhile to note that even the segregated image of traditional markets, in fact, assumes that each market could have a single equilibrium within it, though isolated. However much the market was inevitably the sphere adjusting demand and supply, this does not mean that the adjustment must reach a single equilibrium point. The complementarity among monies tells us that actual markets in history were many layered, but that each layer had its interface open to others.[16] That is why the monies were exchangeable, but not always substitutive. Thus, we should not say 'The market makes its money' but rather 'The market makes its monies' as it needs.

[16] A typical example of the interfacial function is found in the circulation of the Maria Theresa dollar in the Red Sea region. A. Kuroda, 'The Maria Theresa dollar in the early twentieth-century Red Sea region: a complementary interface between multiple markets', *Financial History Review*, 14.1 (2007).