The two concepts of money: implications for the analysis of optimal currency areas

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Abstract

Much of the economic analysis of moving to EMU has been undertaken within the context of the Optimal Currency Area paradigm. This is the spatial/geographic counterpart of the currently dominating model of the nature and evolution of money, here termed M theory, whereby money is viewed as having developed from a private sector cost minimisation process to facilitate trading. Here, I argue, first, that there is a second, cartalist, or C theory alternative, which is empirically more compelling. Second, I claim that this approach can predict observed relationships between sovereign countries and their currencies better than the OCA model. © 1998 Elsevier Science B.V. All rights reserved.

1. Introduction

Much of the economic analysis and assessment of the comparative advantages and disadvantages of moving to a single currency, Euro, area in Europe has been undertaken within the context of the Optimal Currency Area paradigm. This, in its turn, is the spatial/geographic facet of the currently dominating model of the nature and evolution of money. The latter views money as having developed by a process, whereby the private sector has sought to minimize the costs of making exchanges in the process of trading. In this paper, I shall argue, first, that there is a second, alternative approach to the story of the evolution and nature of money,

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which is historically and empirically more compelling. Next, I shall claim that this second approach is far better able to predict and explain the observed relationship between sovereign countries and their associated currencies than the OCA model.

In fact, there has been a continuing debate between those who argue that the use of currency was based essentially on the *power* of the issuing authority (Cartalists)—i.e., that currency becomes money primarily because the coins (or monetary instruments more widely) are struck with the insignia of sovereignty, and not so much because they happen to be made of gold, silver and copper, (or later of paper)—and those who argue that the value of currency depends primarily, or solely, on the intrinsic value of the backing of that currency, (Metallists). [1] A conjoint debate exists between those who have argued that money evolved as a private sector, market-oriented, response to overcome the transactions costs inherent in barter, (let us call them Mengerians), [2] and those who again argue that the State [3] has generally played a central role in the evolution and use of money (Cartalists).

There is little doubt that the M team has assembled the more illustrious collection of economists (plus the endorsement of Aristotle [4] and Locke (1960), [5] and has expressed its analysis in more formal and elegant terms, from the earlier economists such as Jevons (1875), and Menger (1892), [6] von Mises (1912), Brunner (1971) and Alchian (1977b), on more recently to Kiyotaki and Wright (1989, 1993), plus a host of other eminent economists. Against them, the C team has arrayed a more motley, fringe group of economists, such as Knapp (1905) in Germany, and Mireaux (1930) [7] in France and (most of) the post-Keynesians in the UK and USA. [8] Nevertheless, as Mélitz (1974) and Redish (1992) have noted, the C team approach has also received the support of a large number, probably a sizeable majority, of those in other disciplines, e.g., anthropologists, numismatists and historians concerned with the origin of money. [9] Whereas the M group has been strong on formal theory, it has been constitutionally weak on institutional

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[1] As noted in Goodhart (1989) (Chap. 2, p. 34). The problems which the switch to fiat money cause for M-form analysis are addressed later in Section 2.

[2] After the paper of Menger (1892).

[3] The religious authorities also played a major role, see [13,18]).

[4] *Politics*, Vol. 1 (circa 340 BC), also see comments by Grierson (1977) (p. 9), and [11].

[5] *Two Treatises of Government*, Second Treatise, pp. 318-320. Also, in the same vein, see Pufendorf (1744), Book V, Chap. 1.

[6] In his *Economic Journal* paper of 1892, Menger assembled virtually all the elements of the intuitive analysis that has remained at the heart of the M-form theory. Subsequent economists with similar views have developed more technically advanced and mathematically rigorous models of the same process without much change to its central message.

[7] Also see Fontana (1996).

[8] Keynes (1935) (pp. 3, 4), believed that *fiat* money had to be explained on a Cartalist basis, but there is less evidence on his views of the earlier origins of money.

[9] A leading contributor in this group is Grierson (1977). His pamphlet on *The Origins of Money* is particularly useful. Also see Einzig (1949) and Polanyi (1957).

detail and historical empiricism. Mélitz is the only current economist from the M team, known to me, who tries to address the anthropological and historical issues presented by the C team.

I shall expand on this discussion in Section 2, and attempt to demonstrate where the M team's model has its main weaknesses, and to provide further evidence, historical and analytical, in support of the C team approach.

The optimal currency area theory (OCA) connected with the names of Mundell, McKinnon and Kenen is a natural extension of the M team theory into the spatial, geographic domain. If the origin of money is to be seen in terms of private sector market evolution, whose function is to minimise transactions costs, then the evolution of a number of separate currencies in differing geographical areas should, analogously, be analysed in terms of private sector market evolution, whose function would have been to minimise some set of (micro-level) transaction and (macro-level) adjustment costs. Against this, the C team analysts would claim that the spatial determination of separate currencies has almost nothing to do with such economic cost minimisation and almost everything to do with considerations of political sovereignty. In Section 3, I shall argue that the C team hypothesis does far better in explaining and predicting historical reality than the M team (OCA) model. Indeed, the discrepancy is so marked that the continued supremacy among economists of the M (OCA) model indicates how strong remains the attachment of economists to nicely constructed models, whatever the facts may be (the belief that Central Banks not only can, but also do, control the monetary base of their economy is another example of this genre). The comparative paradigmatic success of the M team (OCA) model may also reflect economists' normative preference for systems determined by private sector cost minimisation rather than messier political factors.

Much of the discussion of the cost/benefit balance of, and the appropriate boundaries for, the single currency, Euro, area within the European Union have been undertaken within the context of the M (OCA) model. If we should reject that model, in favour of the C model, as is argued here, this would suggest a need for reconsideration of the issues that arise.

The key relationship in the C team model is the centrality of the link between political sovereignty and fiscal authority on the one hand and money creation, the mint and the central bank, on the other. A key fact in the proposed Euro system is that that link is to be weakened to a degree rarely, if ever, known before. A primary constitutional feature of the European Central Bank (ECB) is to be its absolute independence from government (at any level). Meanwhile, the political and fiscal powers of the various European institutions (Parliament, Commission, etc.,) at the matching federal level are far weaker (than has been the case in other previous federal states). That, in itself, raises constitutional and political issues, such as what would happen if the wishes of the community, expressed through its various (democratic) institutions, should not coincide with either the objectives or the operations of the European System of Central Banks (ESCB)?

Within the Euro area, the main political and fiscal powers are, instead, to remain at the level of the nation state. Historically, the nation states have been able, in extremis, (whether in the course of war or other—often self-induced—crisis), to call upon the assistance of the money-creating institutions, whether the mint via the debasement of the currency, a Treasury printing press, or the Central Bank. Whenever states (as in the USA or Australia), provinces (as in Canada), cantons, länder, etc., have joined together in a larger federal unity, both the main political, the main fiscal and the monetary powers and competencies have similarly emigrated to the federal level. The Euro area will not be like that.

In particular, the participating nation states will continue to have the main fiscal responsibilities; but in the monetary field, their status will have changed to a *subsidiary* level, in the sense that they can no longer, at a pinch, call upon the monetary authority to create money to finance their domestic national debt. There is to be an unprecedented divorce between the main monetary and fiscal authorities.

The thrust of the M team's theoretical analysis is that this divorce is all to the good; indeed, it is largely the purpose of the exercise. The blame for recent inflation has been placed on political myopia, via the time inconsistency analysis, and the ability of the political (fiscal) authorities to bend and misuse monetary powers for their own short-term objectives. While there is much truth and realism in this analysis, the C team analysts worry whether the divorce may not have some unforeseen side effects.

2. On the nature and origins of money

Many economists and historians have noted the severe transactions costs involved in barter, and also the advantageous characteristics of the precious metals as a medium of exchange (e.g., durability, divisibility, portability, etc.). Clower (1969) is a good example. This conjunction has led numerous economists to construct models showing how the private sector could evolve towards a monetary economy as a function of a search for cost minimisation procedures within a private sector system, within which government does not necessarily enter at all. Kiyotaki and Wright (1989, 1993) provide the current state-of-the-art examples of such models. Menger's work from the Economic Journal, 1892, is, perhaps, the most quoted early example.

Apart from their lack of historical support, (not that any such has usually been considered to be necessary), the main drawback of such models is that they fail to recognize the informational difficulties of using precious metals as money. As I have previously noted (Goodhart, 1989) (p. 34):

> Precious metals in an unworked state have been used as a means of payment
> in exchanges only under very special circumstances—e.g., in the various
> gold rushes in California and Klondike—and even then the picture, immor-
> talised, for example, in a film by Charlie Chaplin, of merchants and bar

tenders weighing and checking the gold dust before accepting it in payment, suggests that payment in unworked precious metals was more in common with barter than with a monetary payment.

When the ordinary person goes into a jeweller's shop, he (or she) has very little capacity to judge the fineness, or weight, of a gold or silver object put before him. We usually take on trust the jeweller's claim about the carats involved, supported by the fact that the claim is *potentially* objectively and independently verifiable, and that the jeweller's reputation depends on such verifiable claims being upheld.

Nevertheless, the cost and time involved in such verification is not small. The whole thrust of the paper of Alchian (1977b) is that money arises as a result of the existence of a good whose identification costs are low, [10] but the costs of identifying the quality of either unworked or fabricated precious metal for the ordinary person is high. An individual could, of course, go to a money-changer for expert advice, but that would also involve costs. So, such costs were probably higher, for example, than the cost of identifying the value of items in common everyday use, e.g., salt, corn, nails or even perhaps cattle, (most people in a rural agricultural community would reckon to be able to assess the value of a cow). [11] Likewise, such costs are again greater than the cost of assessing the value of an item which is acceptable by being part of a set of items needed for some intra-societal functions (e.g., religious or wergeld); Grierson (1977) is a leading advocate of this latter view (see Appendix A); also see Einzig (1949).

The above argument may appear to be a straw-man; few people have argued that precious metals would be used as a medium-of-exchange currency, until the identification problem was largely resolved by the technical innovation of a mint process, whereby the identification costs could be drastically reduced by means of

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[10]   Now, if there is some good in which identification costs are both (a) *low* and (b) low for *everyone*, that will permit purchase of product identification information cheaply from the specialized intermediary expert. If his costs of identifying that offered (money) good are less than the reductions in costs by using the specialist for information about the basic goods, the total costs of identification can be reduced.

(p. 117).

        Costs of identifying qualities of a good are what counts. If costs for some good are low and generally low across members of society, the good will become a medium through which information costs can be reduced and exchange made more economical.

(pp. 121–122).Page numbers are from the reprint in *Economic Forces at Work* (Alchian, 1977a).
[11] Burns (1927) records that lumps, bars or instruments in copper became acceptable in exchange in the early civilizations, e.g., Egypt, Babylon and China, but there was sometimes reluctance to switch from the use of cattle for certain quasi-monetary purposes.

        The cattle unit [in Rome] died hard, for twenty years later [circa 430 B.C.], it was necessary to order by law (the lex Papiria) that payments in copper should replace payments in cattle.

(p. 17).

stamping a quality guarantee upon a coin (see Appendix B). Thus, the argument is that a combination of the innate characteristics of the precious metals, *plus* the identification cost reduction allowed by minting, enabled the private sector to evolve towards a monetary system.

Again, however, that analysis is historically flawed. Although, once the idea and technical process is discovered, minting would seem to be as capable of being done within the private sector as any other metal-working process, in practice, minting has, in the vast majority of cases, been a government, public sector, operation. [12] Amongst the experts on the historical evolution of minting coins are MacDonald (1916), Grierson (1977, 1979) and Craig (1953). These authorities, in turn, refer to hosts of other earlier writers. In those cases where the mint has been run by the private sector, the government has in most cases both set the standards of fineness and extracted a rent, or seigniorage tax, that collected most of the available profits. This concentration of minting under the government's aegis is not accidental. There are two associated reasons why this is so.

First, a mint requires an inventory of precious metals. It will, therefore, act as a magnet for opportunistic theft and violence. It will require protection, and the protector, (who wields the force necessary to maintain law and order in the economic system), will therefore be able to extract most of the rent from the system.

Second, the costs of identifying the true value (quality) of the metals included in the minted coin leads to time inconsistency. The mint operator is bound to claim that the quality will be maintained forever, but in practice will always be tempted to debase the currency in pursuit of a quick and immediately larger return. [13] Olson (1996) has described how the development of a secure, dynastic regime reduces time inconsistency in the ruler [14] (also see McGuire and Olson, 1996).

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[12] ''And let no man have a minter but the King'', from the ordinances of Aethelred (Wantage, 1002) reported in Craig (1953).

[13] Craig (1953) (pp. 27–28) records that:

> The Chronicle of Winchester records that the current specie of this country was so much debased in consequence of the great number of mints established in different cities, of which the masters seemed to contend with each other who should enrich himself most at the expense of the public, that it would pass neither in foreign markets nor even in our own.

[14] Perhaps the most interesting evidence about the importance of a monarch's time horizon comes from the historical concern about the longevity of monarchs and from the once-widespread belief in the social desirability of dynasties. There are many ways to wish a King well, but the King's subjects, as the foregoing argument shows, have more reason to be sincere when they say ''long live the King.'' If the King anticipates and values dynastic succession, that further lengthens the planning horizon and is good for his subjects. The historical prevalence of dynastic succession, in spite of the near-zero probability that the oldest son of a king is the most talented person for the job, probably owes something to an intuitive sense that everyone in a domain, including the present ruler, gains when rulers have a reason to take a long run view.

(Chap. 2, p. 25).

Few inventions are made by government bodies (except perhaps within the military field, e.g., the Manhattan project). This has also been so in the monetary field. The metallurgical developments and the invention of banknotes, in China and the West, came initially from the private sector, but money's initial role as a means of payment, for wergeld, bride price, religious occasions, etc. (which probably predated money's role as a medium of exchange), and its role in facilitating the fiscal basis of government, (discussed further later), meant that government made the monetary process, e.g., the guarantee through minting of the fineness and at the outset of the weight of the coins, into a pillar of the sovereign state. [15]

There is, as set out by Grierson, a further argument leading to the same conclusion. Society cannot work if violent behaviour is too prevalent. Some people will always be violent. An initial act of violence provokes revenge and a possibly endless feud. Feuds destroy society. One early crucial function of money, wergeld, was to set a tariff, whereby (the relatives of) the initial offender could recompense the damaged party. This practice spread to other inter-personal relationships, (bride-price, slaves), in some cases before formal markets and the use of money in trade arose. [16] Also see Exodus 21:32,35 and Deuteronomy 22:13–19,28–29. Kleiman (1987b) (pp. 261–287) describes such compensations.

I take it as a maintained assumption that the establishment of law and order involves and requires a governance structure. Others, for example, Benson (1990), do not accept that; it is, indeed, a major underlying issue. If law and order, the enforcement of contracts, and the whole infrastructure of settled behaviour that makes markets (and money) work is really independent of the governance structure of our societies, then, the M team approach becomes much sounder—the more so, if governments are actually inimical to such necessary infrastructure, but to me, the concept that the existence of law and order is independent of government seems pure (anarchist) wish-fulfillment.

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[15] On this, see Gerloff (1952) and Laum (1924).

[16] Mélitz (1974) (pp. 39–42), accepts that money in its guise of a means of payment for such intra-societal transfers antedated money as a general medium of exchange in markets. However, on p. 77, he *defines* money as a medium of exchange held ''in order to economize on transaction costs in the activity of trading a variety of other types of goods.'' My argument is that the means of payment role was (usually) prior in time and helped to facilitate and develop the subsequent more general medium of exchange role. The temporal ordering of the various uses of money remains, however, a contentious issue. The Bible, Genesis, 23: 16 and 37: 25, 28 indicate that silver was used as a medium of exchange for (large) payments from a very early date. In early history, money and religion were often as closely, or more closely, inter-related than money and the State. Temples were the great economic centers of the ancient world. They provided an opportunity to trade, especially at the festivals marking the end of the agricultural season; and having amassed considerable wealth from the gifts of their cult's devotees, they very often became lenders and 'bankers' on a great scale, hence, their need for a monetary standard, which probably anteceded that of the State. I am indebted to Professor Kleiman for pointing me in this direction. Also, see Kramer (1963) (pp. 75–86).

What is remarkable when reading the various histories of minting and currency is the correlation between strong kings (e.g., Charlemagne and Edward I) and successful currency reforms. Naturally, however, the temptation to debase the currency increases when (external) pressures threaten the continuing life of a government. Thus, Henry VIII's debasement was related to war with France and Scotland at a time when ''The Exchequer's poverty was extreme...'', Craig (1953) (p. 108). For a splendid account of how that process (currency debasement) worked in practice, see Sargent and Smith (1995). Glasner (1989), and (forthcoming, Glasner, 1998), emphasizes the value to governments facing (military) crises of having control over money creation.

Under the C view of money creation, the collapse of strong government would lead to the cessation, or downgrading of the quality, of minting and a reversion towards barter. [17] Under the M view, once the private sector has established a monetary equilibrium, thereby much reducing transactions costs, there is no conceivable mechanism within the model which would lead back to barter. Let us look at history. In Japan, for example,

> Rice and fabrics had been commonly used as a medium of exchange after the government ceased the mintage of coins in 958 AD...

(Seno'o, 1996)and

> by the end of the tenth century, money circulation ceased and the economy regressed back to a barter economy.

(Cargill et al., 1997).

In Europe, during Roman times, all coins were minted on the state's account; according to Crawford (1970), the fiscal needs of the state determined the quantity of mint output and coin in circulation. As Redish (1992) notes:

> Howgego (1990) has recently amplified this view suggesting that there was no one-to-one correlation between state expenditures and new coinage. If the state acquired bullion, it might be coined even in the absence of fiscal need. On the other hand, expenditures could be met by older issues, for example, coins received in taxes.

In any case, when the barbarians submerged Rome, strong government disintegrated. Both governments and mints fragmented into weaker smaller units. MacDonald (1916) describes the process (see Appendix C) as does Craig (1953), who also notes that amongst the ruling bodies operating mints at this time were Lords

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[17] In more recent centuries, however, the alternative, chosen by the private sector has been, instead, to switch from using the inflationary currency of the domestic government to the more stable currency of some other government, see Bernholz (1989). The existence of such substitute currencies places some (high) upper limit on the potential ravages of the inflation tax.

Spiritual, as well as Temporal. [18] With governments being weaker and less secure, their currencies became of lower quality, more likely to be debased, and less acceptable in commerce (much of the minting that occurred was not to finance trade, but for Danegeld and other facets of (military) relationships between power centres). Meanwhile, most, but not all, commercial relationships reverted to barter. This decline was halted by Charlemagne and his successor, Louis the Pious.

It is only when a settled and strong government has been established that the authorities can offer both a sufficiently long time horizon and the necessary control to establish a high quality mint. At the same time, the creation of money greatly eased and benefited the authorities' fiscal position, as well as much reducing transactions costs for the general public. This may have been so even at the very outset of coinage; as Redish (1992) notes (also see Grierson, 1977):

> Numismatists believe that the earliest coins were produced at Lydia (now Western Turkey) in the mid-seventh century BC. The coins were made of electrum, a naturally occurring alloy of gold and silver. They had a design on one side and were of uniform weight but had a highly variable proportion of gold. In an influential article, Cook (1958) argued that these coins were introduced to pay mercenaries, a thesis modified by Kraay (1964) who suggested that governments minted coins to pay mercenaries only in order to create a medium for the payment of taxes. Both interpretations stress the role of the government in the introduction of coinage. [19]

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[18] Thus, Craig (1953) (p. 12), writes that:

> Mints run by ecclesiastics, on the other hand, were proprietary. Only two are known to have survived from the earliest primitive period. The archbishop of Canterbury has two units.... The single unit of the abbot of St Augustine's was merged in this property in or before the tenure of the See by the patron Saint of Goldsmiths, St. Dunstan. The saint's three minters were serfs; he was a hard man of affairs who once shocked his congregation by suspending Easter mass until they hanged certain counterfeiters of his coin, whose trial the people would have delayed till Monday out of respect for the day.

[19] This interpretation has not gone unchallenged, as Redish again notes:

> More recently, Price (1983) has observed that the early electrum coins were privately issued and not issued by states. Further, he argues that the electrum coin, which was of uniform weight but had a highly variable proportion of gold, would have been overvalued if it traded at a uniform value. This he concludes makes it unlikely that mercenaries would have accepted it. Price's interpretation is that the early coins emerged in the context of a gift/exchange economy, and provided a means for standard bonus payments, and that the imprint was used to identify the issuer not to guarantee the coin's value. Only later, according to Price, with the introduction of gold and silver coin, did coin become a means of standardizing payments. However, Price does not explain why individuals accepted overvalued coins as gifts. Indeed, it is not clear whether these coins had a uniform value and at what point the pieces of stamped metal crossed the line between medal and coin.

The linkages between the creation of currency and taxation are multifaceted, [20] and the subject deserves a major study in its own right; (it is largely because of the domination of the M theory's denial of the importance and necessity of such links for the creation of money, that this has not been forthcoming). First, without money, it would be hard to place taxes on anything other than the production, transport and trade of goods, since only goods (or labour time) could be delivered. Once money exists, poll, income, and expenditure taxes, as well as taxes on the production of services become easier to levy. When taxes are received in goods or labour, the balance of goods (and labour) obtained will not be that required for public sector expenditures; so, money reduces the transactions costs of governments, pari passu with that of the private sector. By the same token, taxes payable in monetary form raise the demand for base money. Since a government obtains seigniorage from money creation, this benefits the fiscal position twice over, not only from the taxes levied, but also from the seigniorage resulting from the induced monetary demand. This was, as Lerner (1954) notes, one of the major reasons for the introduction of Confederate currency by the South in the US Civil War:

> Secretary Memminger saw two immediate and indispensable benefits from levying taxes payable in government notes. First, taxes created a demand for the paper issued by the government and gave it value. Since all taxpayers needed the paper, they were willing to exchange goods for it, and the notes circulated as money. Second, to the extent that taxation raises revenue, it reduced the number of new notes that had to be issued. Memminger's numerous public statements during the war show that he clearly realized that increasing a country's stock of money much faster than its real income leads to runaway prices. They also show that he believed that a strong tax program lessens the possibility of inflation. (p. 508).

Indeed, the imposition of taxes, payable only in money (and not in goods or in kind), has been used on numerous occasions in colonial history for the primary purpose of forcing taxpayers out of a (non-monetary) subsistence economy and into a cash economy producing goods for sale in the world economy; the receipt of extra fiscal revenues was in some cases just a subsidiary motive, as recorded by writers such as Ake (1981), Rodney (1981), and Amin and Pearce (1976).

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[20] Selgin and White (1996) state that ''Government monopoly in issuing currency can thus be understood as part of the tax system.'' That is certainly one key facet of the relationships between money and government.

There is, indeed, a large literature on the use of taxes, payable in monetary form, as a means of driving peasants into a monetary relationship with a capitalist economy. This is not only to be found in the literature on colonial development, but also in the earlier development of capitalism in Europe, e.g., Hoppe and Langton (1994).

Once the close link between money creation and taxation (and of both to the underlying structure and stability of government) is understood, the move from metallic currency to a fiat, paper, currency becomes much more straightforward to understand. Even if one should accept the M theory of the evolution of metallic coins as money, it is problematic to use that same theory in its pure [21] form to explain why agents should suddenly *all* be willing to jump from using paper notes which were ultimately claims on precious metals (i.e., private or public sector bank notes convertible into such precious metals) to paper notes which were backed by no specific assets. [22] Instead those notes were, and are, backed by the power of government (e.g., legal tender laws) and its ability to impose taxes payable (and often only payable) in that fiat currency (as well as legal tender for the discharge of all other payments within the country).

Thus, the M-form theory has difficulties with explaining the introduction and

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[21] Pure in the sense that the move to fiat paper money is also capable of explanation as a private-sector cost-minimisation process. Of course, if M theorists are prepared to accept that government had taken over (usurped) the control of the monetary base by then, the rest is straightforward. The abandonment of convertibility into a real, metallic base was an (unhappy) act of government, (as is clear from history). What remains, perhaps, at issue between the M and C theorists is how much of the subsequent acceptance of fiat money is due to the power of government, e.g., to impose taxes (C theory), or to network factors and inertia encouraging people, without prompting from government, to stay with the existing currency (M theory). I am indebted to correspondence with Professor Kevin Dowd for raising this issue with me, and also sending me his working paper with Selgin (Dowd and Selgin, 1995). Quite a number of economists combine the belief that M-form cost-minimisation search theory explained the initial development of money, but that more recently, the State has clearly taken over the provision of fiat currency. So, whether, or not, they like the result, they accept that the C-form theory is at present, more realistic (see Congdon, 1981).

[22] Ritter (1995) argues that a community could benefit from moving to a fiat money economy if the issuers could commit to limiting the growth of such base money. Quite so, but as Selgin (1997) argues, there is a, probably insuperable, co-ordination problem within society, unless the authorities can *coerce* the residents simultaneously to switch, (as with the introduction of the Euro in 2002). Moreover, fiat currency has, virtually without exception, been introduced at times of war and other crises, when the rate of growth of base money has been high, on many reckonings 'excessive', and certainly *not* subject to any credible limitation commitment.

use of fiat currency. The C-form theory has no such difficulties. [23] The transition was entirely natural. The interesting questions relate, instead, to the factors determining the historical timing of the switch. The growing power of the nation state and the extra seigniorage that could be obtained (particularly the need for such in war-times) pushed for an earlier adoption of fiat currency. Historical inertia, credibility effects (time inconsistency problems were *always* foreseen and legal tender fiat currency invariably had a bad reputation as potentially low quality money), and perhaps at times, concerns about counterfeiting, tended to delay the switch.

Let me conclude this section by pointing out that the M-form theory finds it difficult to account for the role, or existence, of money within a general equilibrium model. Money in the utility function, or cash-in-advance models, are proposed, without much conviction. This difficulty is not surprising given that such models also abstract from the existence and role of government. While it is, of course, the relationship between taxation and the demand for money that the C-form theory emphasizes, it should also be remembered that it is the maintenance of law and order, the form and enforcement of contracts, and the whole infrastructure of regulation within society, that allows the epiphenomena of (organized) (private sector) markets to occur at all.

A disclaimer may, however, also be needed. The purpose of this section was to argue, first, that money frequently played an initial means-of-payment role in inter-personal social and governmental roles *before* it played a major role as a medium-of-exchange in market transactions, and second, that the relationship of the State, the governing body, to currency in all its roles has almost always been close and direct, but I do *not* claim that the private sector cannot, and has not, ever been able to develop monetary systems without the involvement of state authorities. Perhaps the most likely early historical example of purely private sector monetary systems is the Aztec cocoa bean money (Mélitz, 1974) (pp. 129–130), but more recent examples include the cigarette money of POW camps,

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[23] Not surprisingly, Smith (1904) understood the relationship between taxation and fiat currency, even before any widespread usage of the latter. Thus, Professor M. Forstater, of Gettysburg College, has brought to my notice:

> ...the following sentence on p. 322 of the justly famous Cannan edition of *The Wealth of Nations*:

> A prince, who should enact that a certain proportion of his taxes should be paid in a paper money of a certain kind, might thereby give a certain value to this paper money; even though the term of its final discharge and redemption should depend altogether upon the will of the prince.

Cannan's 'sidebar' (his summary of each paragraph given in the margin) for this paragraph reads:

> A requirement that certain taxes should be paid in particular paper money might give that paper a certain value even if it was irredeemable.

Radford (1945) (pp. 189–201), and the use of vehicle currencies in foreign exchange trading, (Swoboda, 1969; Hartmann, 1994a,b). Several national currencies have in the course of history become widely accepted internationally, e.g., the Byzantine Hperpyron or 'Bezant', the Florentine Guilder, the Venetian Ducat, and more recently, the pound sterling, US dollar and in some countries, the Deutschmark, in some cases against the wishes, and without any involvement, of the issuing government. Indeed, many economic agents voluntarily hold money issued by a state other than their own, e.g., US dollars almost everywhere, Deutschmarks in East Europe, etc. (see Cohen, 1996). Other examples can be added. Moreover, were the state authorities now consciously to choose to abdicate their monetary role, the void would surely be taken up by commercial institutions.

3. The M-form spatial theory, or optimal currency areas

If the use of money can evolve through a (search) process of cost minimisation, without any necessary intervention by a government, then, by analogous reasoning, the spatial domain for any one money [24] can also evolve from such a similar cost-minimisation search process. The optimal currency area analysis has, indeed, followed that approach. It has broadly compared the benefit, in terms of transaction cost minimisation, of having a single currency over a wider area against the costs in terms of adjustment difficulties (Krugman, 1993). Those costs depend in part on market imperfections, whereby there is imperfect flexibility (either spatial, i.e., migration, or in (nominal) wages) in labour markets. The standard litany of factors affecting OCAs then follows, such as size, openness, labour market

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[24] Dowd and Greenaway (1993) (pp. 1180–1189), have described how 'network externalities' will tend to limit the use of money for ordinary retail purposes in any area to a single kind of money, (in which, of course, there will be coins/notes of many values exchangeable at fixed, set ratios). When the quality of money in an area declines sharply (debasement, inflation), residents may turn increasingly to a higher quality money (dollarisation). The costs of overcoming such network externalities may make such a switch partly irreversible. The dominance of a single currency in a single area does not, of course, rule out multiple currency holdings near boundaries, nor holdings of foreign currencies by residents for trade, travel and portfolio diversification reasons; on this latter view, see Cohen (1996). The proposed joint usage of national currencies and Euros during the change-over transition period within EMU 1999–2002 is *not* a counter-example, since the ratio of the value of the Euro to the national currency will be absolutely fixed and irreversible. What is, however, new is that this fixed ratio will be highly user-unfriendly, (e.g., 1 Euro = 0.876534 National Units; it has been agreed that the rate will be applied to *six* significant figures), and not the standard user-friendly progression of currency values, e.g., 1, 2, 5, 10, 20, 50.... There will, therefore, be serious additional information and familiarization costs involved in the transition. Note that virtually all prior currency reforms involved knocking zeros off existing currencies, e.g., 1 New Franc = 100 Old Francs. They were often somewhat traumatic for residents; the switch to the Euro will be *much* more so.

flexibility, concentration or diversity of production, nature of and specificity of shocks (whether symmetric or asymmetric), etc.

Note, however, that following M-form theory, the functions and role of government do not necessarily, or even usually, enter this list. Under the (pure) OCA theory (Mundell, 1961) there is no reason why currency domains need to be co-incident and co-terminous with sovereign states. There is no reason why such a state should not have any number of currencies from zero to *n*, and an optimal currency area, in turn, should be able, in theory, to incorporate (parts of) any number of separate countries from one to *n*. Under the M-form OCA theory, there should be a divorce between currency areas and the boundaries of sovereign states. Most subsequent OCA applied research has, however, simply taken for granted the initial starting concordance of sovereign governments and currencies, and then applied the standard tenets of OCA theory to the question of monetary union between such countries; but that ignores the 'political economy' factors that made currency areas coincident with countries in the first place, and hence, likely to overlook the crucial political economy factors that will determine the success, or failure, of such unions, including EMU.

Such lack of concern for political economy considerations is not the case with C-form theory. Since under this theory, money is intimately bound up with the stable existence and fiscal functions of government in any area, the sovereign government of that area is predicted to maintain its single currency within the area's boundaries.

Which theory has the better predictive and explanatory power? Si monumentum requiris, circumspice! In a recent paper, Eichengreen (1996), writes:

> Michael Mussa is fond of describing how, each time he walks to the IMF cafeteria, down the corridor where the currency notes of the member states are arrayed, he rediscovers one of the most robust regularities of monetary economics: the one-to-one correspondence between countries and currencies. If monetary unification precedes political unification in Europe, it will be an unprecedented event.

(p. 12).

Yet, the economics profession has taken little notice of this 'robust regularity' in its assessment of monetary theory (national or international), and in its adherence to the M-form theory of private sector evolution. Moreover, it is difficult to see how several large countries, encompassing regions geographically separate, sometimes at very different stages of development, often with regionally concentrated production, could possibly meet the criteria for OCAs, e.g., USSR before its collapse, Brazil, Australia, Canada, and even USA.

In how many countries do we find multiple currencies? Prospectively, there will be, after 1997, one such country, China, where the Special Autonomous Region of Hong Kong will keep its separate currency (for 50 years). Given the political circumstances of the planned arrangements, this could be described as an

exception that proves the rule. [25] In some countries which have suffered hyperin-
flation, 'dollarisation' has occurred, as in Argentina, Peru and—to some extent—
Russia, and similarly with respect to the Deutschmark in Yugoslavia (see Petrović
and Vujošević, 1996, on the Yugoslav hyperinflation of the 1990s). What is
remarkable in these cases is how high the inflation tax rate on domestic currencies
has to climb before the public switches to an alternative foreign currency—al-
though once such a switch has occurred, it does not reverse easily or quickly, and
when the public does decide to abandon the inflating domestic paper currency, the
alternative, privately chosen, good money can virtually drive out the 'bad' official
money, (Bernholz, 1989).

There have, however, been a few historical examples where currencies from
several states were treated as equally acceptable in all of them. These included the
Latin Monetary (Silver) Union (1865–1914) [26] and the Scandinavian Monetary
Union (1873–1914). [27, 28] Cohen (1993) has studied the historical cases of such
monetary union, [29] and concludes that the economic factors considered in standard
OCA theory have little, or no explanatory or predictive power to explain the varied
history of the sustainability of such unions, and that political considerations are
over-riding.

Only in one single respect does the M-form, OCA theory have much statisti-

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[25] Also, see Kleiman (1994) (pp. 365–369) for a discussion of the agreement on currency usage in
the areas of the autonomous Palestinian authority. Andorra and Namibia also have more than one legal
tender.

[26]   [T]he union managed to hold together until the generalized breakdown of monetary relations
       during World War I. Following Switzerland's decision to withdraw in 1926, the LMU was
       formally dissolved in 1927.

(Cohen, 1993) (p. 191).

[27]   By the turn of the century, the SMU had come to function, in effect, as a single region for all
       payments purposes, until relations were disrupted by the suspension of convertibility and
       floating of individual currencies at the start of World War I. Despite subsequent efforts during
       and after the war to restore at least some elements of the union, particularly after the members'
       return to the gold standard in the mid-1920s, the agreement was finally abandoned, following
       the global financial crisis of 1931.

(Cohen, 1993) (p. 191).

[28] The Gold Standard did *not* represent an example of such a monetary union. While foreign agents
could obtain national currencies at relatively low transaction cost by shipping gold in either coin or bar
form, the currency circulation within each participating country was as overwhelmingly national as
now, (and the gold value of national currencies could, and did, vary between time-varying physical
arbitrage points).

[29] Amongst current monetary unions, Cohen also studies the CFA and Eastern Caribbean Currency
Area. The CFA has been held together by French political, even including military, and financial
support, while the populations of the ECCA are so tiny that the entire region is still too small for
anything other than a currency board.

cally significant explanatory power, that is, tiny States (principalities like Liecht-enstein, San Marino, Monaco, Andorra, etc.) will generally not have their own currencies; and that there is some (statistical) tendency for larger states to adopt more flexible exchange rates and smaller states pegged exchange rates (see, for example, Al-Marhubi and Willett, 1996); but this is observationally equivalent, to some considerable extent, with the belief that the tiny principalities have very little sovereign power, and are in several cases, effectively vassal subsidiaries of their larger neighbour. Consider, for example, the two small countries that use the US dollar as currency—Panama and Liberia. Do these satisfy the OCA model, e.g., with similar shocks and an integrated labour market with the USA, or is the rationale for such currency usage to be found in political history?

It is certainly true that sovereign states have at times chosen voluntarily (and temporarily) to relax part of their sovereignty by committing themselves to maintaining pegged exchange rates against a precious metal, or against the currency of another state. The gold standard was, perhaps, the best and most successful example; but, as Panic (1992) emphasizes, the countries participating in that did so by independent, voluntary choice, each maintaining, and on occasions utilising, the right to withdraw. Moreover, as Glasner (1989) (p. 39) has empha-sized, it can be optimal for a sovereign country to pre-commit to a regime which will ensure price stability (so long as that regime continues), but only if it retains the ability to utilize its independent money creation powers in a crisis. [30]

Perhaps the clearest indication of the relative predictive and explanatory power of the C-form theory comes on the occasion of the break-up of existing federations into separate States, as in the cases of the USSR, Czechoslovakia and Yugoslavia in the 1990s, and Austro-Hungary after World War I, or on the other hand, of the unification of smaller States into a larger Federal State, e.g., the USA, [31] Ger-

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[30] One useful and illuminating way of thinking about EMU is to regard this as the monetary symbol of a political pact between the two largest countries of Northern Europe, Germany and France, that there cannot and must not ever in future be a serious crisis, let alone a war, in their bilateral relationships. This line of thought comes naturally to C-team theorists and to politicians such as Kohl. It makes no sense, of course, to M-form theorists who see no necessary or desirable connections between monetary and political relationships.

[31] ''When the First Continental Congress met in 1775 in Philadelphia, the first order of business was to establish a national currency'' Kohn (1991) (p. 70); but States' note issues were not then banned, and that plus, of course, reliance on the issue of 'Continentals' to finance the War of Independence led to major inflation. This led the Constitutional Convention to establish in Article 1 of the Constitution of 1789 that Congress, and not the States, ''shall have power to coin money, regulate the value thereof and of foreign coin'', and that ''No State shall coin money, emit bills of credit, make anything but gold and silver tender in payment of debts.'' (Davies, 1994) (p. 466).

many, [32] Italy, [33] etc., on their foundation. The C-form theory predicts that the fragmentation of sovereignty will lead to a fragmentation into separate currencies, and, per contra, that unification into an effective federal state will lead to the unification of previously separate currencies.

The M-form theory has nothing useful to offer on this. If the USSR were an optimal currency area before its break-up, it should have presumably remained so afterwards. If Prussia and Bavaria had been OCAs before the unification of Germany, they should presumably have remained so afterwards.

There is, however, one qualification to the above argument, that is, the acts and existence of a sovereign government in a particular geographical domain may serve to make that domain an OCA, whereas had there been several governments in the same domain, it would not have been an OCA. For example, if the existence of a unified-governmental fiscal system should be helpful in mitigating asymmetric shocks affecting regions in that domain, then, it would be more likely to be an OCA. Again, a sovereign government is likely to impose laws and to encourage behaviour (e.g., use of a single dominant language) that usually serve to make (labour) markets far more flexible within, than between, such countries. Similarly, the actions taken by such governments can be regarded as idiosyncratic shocks. For such reasons, it is possible that some of the explanatory factors determining OCAs could be argued to make them co-incident with sovereign states. Cesarano (1997) proposes that the boundaries of the nation state define an equilibrium currency area. Nevertheless, the speed, and the patent political involvement, attending the association of monetary and sovereign fragmentation or federal

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[32] In its pamphlet, entitled *The Reichsbank*, which the Reichsbank published on its 25th anniversary in 1900, the opening paragraphs read as follows:

> The newly established German Empire found in the organization of the coinage, paper money, and bank-note systems, an urgent and difficult task. Probably in no department of the entire national economic system were the disadvantages of the political disunion of Germany so clearly defined as in this; in no economic department were greater advantages to be expected from a political union. Although the customs union (Zollverein) had happily united the greater part of Germany in a commercial union, similar attempts in monetary affairs had met with but modest success, and were absolutely fruitless in banking. The inconvenience most complained of was the multiplicity and variety of the different coinage systems (seven in all) in the different states, also the want of an adequate, regulated circulation of gold coins.

(Reichsbank, 1900).

[33] As reported by Canovai (1911) (p. 26):

> The prior political fragmentation of Italy left the country at the beginning of the 1870s with ''...conditions of the institutions of issue and the paper currency [that were] abnormal and unorganized, since there was a mixture of institutions, different in nature and privilege, and a hybrid circulation, partly private and partly belonging to the State, which could not truly serve the economic and monetary conditions of the country.''

unification over geographical areas makes it extremely hard to claim that this follows, or was caused by, some kind of private sector evolutionary search process.

What, of course, is remarkable and unique about the move to EMU and the Euro is the absence of an accompanying federalisation of governmental and fiscal functions. This divorce between monetary (federal) centralisation and governmental decentralisation at the level of the nation state, especially with the main fiscal functions remaining at that lower, national level is the source of potential tensions. It was, in part, to address such tensions that the Maastricht fiscal criteria and the subsequent Waigel 'growth and stability pact' were introduced.

We should ask why M-form theory maintains such a grip (as contrasted with the C-form theory) over most economic thought. For the reasons outlined in this, and the previous section, it can hardly be because it provides a positive explanation of observable events. Compared with the success of the C-form theory, the explanatory (or predictive) capacity of the M-form theory is nugatory. As Cesarano (1997) also notes: ''The standard theory of optimum currency areas is falsified by the empirical evidence.'' (p. 57).

One possible rationale is that the M-form theory was never meant to be a positive, explanatory theory, but instead a normative theory, of what should be. As one referee commented: ''OCA theory is a normative, not a positive theory.'' A weak form of this would be to recognize that, in practice, monetary institutions are inherently and au fond associated with considerations of political sovereignty, but that the subsidiary function of M-form OCA theory is to assess the balance of purely economic benefits and costs that this may generate. The problem with this is that the historical record of the association of money creation with the establishment and maintenance of a stable sovereign power is so overwhelming (apart from the case of tiny, and by the same token politically weak, states) that the balance of purely economic benefits and costs entailed by OCA must presumably be of second order importance.

One implication of the C-form theory is that the value of fiat currency will depend on expectations of the future existence of the current government, and the prospective treatment of that currency by a successor government. This suggests that a currency's valuation should be affected both by war 'news' and news on a defeated country's treatment, post-bellum, independently of the past and prospective future rate of expansion of such money supply. This line of thought has been advanced by economists such as Mitchell (1903) and Dacy (1984), but the methodologies used in their exercises could be improved.

A much stronger version of such a normative approach is again to accept that governments have almost always (historically and traditionally) taken over (usurped) the primary role in (high-powered, base) money creation, but to argue, using M-form theory, that this was neither necessary, nor desirable. Governments have often used their money creation powers to support and benefit themselves (via debasement and the inflation tax), though usually when they are weak and/or

threatened, especially by war. Clearly, access to the inflation tax benefits such governments. Whether it has benefited, or harmed, the public depends on the circumstances, e.g., the relative value to them of maintaining their existing government. A properly organized system of privately determined money creation could, so it is argued, provide a monetary system with a superior quality. This is the approach taken by economists such as Hayek, many (but not all) monetarists and the Free Banking School. In the absence of any more radical move in this direction, the separation of the powers of money creation in an independent Central Bank, (which under the Maastricht Treaty is required not to take instructions from government(s)), is (usually) seen as, at least, a step in the right direction by M-form theorists.More generally, there has been an overlap between M-form theorists and those who believe that the intervention of government within the economy is excessive, unnecessary (in most cases) and should be reduced. There is, therefore, a (disguised, but not hidden) agenda of M-form theory in advocating a reduced role for the State in economic affairs. By contrast, C-form theorists tend to believe that government intervention is an inevitable concomitant of the operation and organization of our (political) system, and many worry whether the prospective European Central Bank (ECB) may not suffer from a 'democratic deficit'—a larger issue which we shall not pursue further here.

4. Conclusion

OCA theory has little, or no predictive or explanatory capacity. Unlike the C-form theory, it is unable to account for the close relationship between sovereignty and currency areas—a relationship that tenaciously persists through the course of the creation, and break-up, of federal states. The empirical weakness of OCA theory, the spatial facet of M-form theory, throws further doubts on the ability and value of the latter to explain the evolution and nature of money as well as C-form theory can. The main advantages of the M-form theory appear to be technical, in that it lends itself better to mathematical formalisation, and ideological, in that it is based on a process of private sector cost minimisation, rather than a messier political economy process. It is, however, a pity to suspect that monetary economics may be driven more by technical and ideological purity than by empirical and predictive capacity.

If, then, the key issue is the (political) relationship between control over money and sovereign power, we need to consider carefully what problems this may portend for the future Euro single currency area. In the Euro area, the traditional historical links between money creation and sovereignty will be broken to a unique extent. Money creation will be the responsibility of a federal body, the European System of Central Banks, intentionally made, by the Maastricht Treaty, entirely independent of Government(s), whereas most other fiscal and other powers will remain in the hand of the participating nation states.

Acknowledgements

Appendix A. Grierson's views on the societal origins of money

In his pamphlet on *The Origins of Money*, Grierson (1977) (pp. 19–21) writes:

> In any case, the generalized application of monetary values in commodities could scarcely have come about before the appearance of market economies, and monetary valuations were already in existence in what Sir John Hicks has felicitously christened 'customary' and 'command' pre-market societies, *A theory of economic history*, (London, 1969), p. 2 ff. (Hicks, 1969) (rise of the market), pp. 63–68 (origins of money). He has to some extent telescoped the invention of money and the invention of coinage, and in my view, he exaggerates the 'store of value' element in early money. Nor, if my argument that money antedated the development of the market is correct, it is the case that the standard ''should be something that is regularly traded''. In such societies, they provide a scale of evaluating personal injuries in the institution which the Anglo-Saxons termed the wergeld, and it is in this institution that the origin of money as a standard of value must, I believe, be sought. The practice of wergeld, that of paying a compensation primarily for the killing of a man, but the term by extension covering compensations for injuries to himself or his family and household, is most familiar to us in its Indo-European setting . . . The general object of these laws was simple, that of the provision of a tariff of compensations which in any circumstances their compilers liked to envisage would prevent resort to the bloodfeud and all the inconvenient social consequences that might flow therefrom . . . . The object of the laws is that of preventing retaliation by resort to force, and the principle behind the assessments is less the physical loss or injury suffered, than the need to assuage the anger of the injured party and make good his loss in public reputation. It would cost one four times as much to deprive a Russian of his moustache or beard as to cut off one of his fingers . . . . Karl Menger, in an impressive article on the origins of money published many years ago, argued ingeniously that one would expect monetary standards to be based on the commodities most commonly and easily exchanged in the market, since these would have the maximum saleability. The law codes suggest that while this may be true of money substitutes, it is not true, or at

least is not necessarily true, of the commodities used as standards them-
selves.

[nota bene, for detailed references see the original.]

Appendix B. Limits to the ability of early mints to guarantee the quality of coins

Although the development of mints provided a major advance in identifying
and guaranteeing the quality and weight of coins, several problems however
remained. Until a process was found to give coins milled edges, coins could be
clipped, and thereby lose weight. Also, as Mélitz (1974) (p. 71) notes:

> Through most of the Middle Ages, many individual coins of the same issue
> differed substantially in weight and fineness. Indeed, prior to the 13th
> century, coinage methods hardly permitted less than a 5 to 10 percent
> variation in weight between individual coins struck from the same plate.
> Thus, accounting prices of different coins belonging to the same denomina-
> tion and issue often varied. Differences in weight and fineness, along with a
> host of other factors, like varying admixtures, ordinary wear, clipping, and
> sweating, continued to produce differences in accounting prices of money
> units of the same denomination and issue all the way down to the 17th and
> 18th centuries.

With coins of varying weight, but of a known, given fineness, transactors
would have to make a difficult choice between weighing coins, a time-consuming
exercise, (or of getting a specialist to assess them), or accepting them as
equivalent, without weighing, e.g., by tale, which carried the risk that some
(underweight) coins would not be subsequently acceptable. See, for example,
Sargent and Smith (1995).

Kleiman (1987a) notes that a defrauded party, when overcharged, could revoke
a deal within a certain time span.

> Ascertaining the 'right' price of an article was thus supposed to be a matter
> of, at most, several hours. The only exception was deficient coins, of which
> it was said: Until when is one permitted to revoke [the deal]? In cities, until
> one can show [the coin] to a moneychanger; and in villages—until [the
> following] Sabbath eve. To understand, we have to remember that the
> coinage circulating in the Roman world of the first two centuries AD was
> most variegated.

Moreover, it was sometimes difficult to check whether the fineness of the coin
was as stated, without complex, and destructive, metallurgical testing. During the

Tokugawa Shogunate in Japan, not only was the fineness of the coins never published, (see Ueda et al., 1996), but also:

> In spite of enormous differences in the fineness of the Kobans created by a series of recoinages, the color of the surface did not deteriorate much and the surface generally shines with a golden color. The Kobans of low fineness, namely the Genroku Koban and the Gembun Koban do look slightly inferior in the surface color to other types of Kobans, but other Kobans minted in and after the Bunsei era show just as beautiful a golden color as the high fineness Keicho and Kyoho Kobans even though their fineness is even more inferior. This phenomenon is produced by the last process in the minting of the Koban called 'color dressing' (color improvement or coloring). This process dissipates the silver element on the surface of Koban by heating it after coating the surface with chemical substances. This process seems to be unique to Japan in the history of minting and we have not heard of any similar instances in other countries ....

Appendix C. MacDonald's description of the monetary disorders after the fall of Rome

In his book on *The Evolution of Coinage* (1916), MacDonald describes the monetary consequences of the collapse of the Roman Empire in the following terms (pp. 29–31):

> When Rome fell, the triumphant invaders took over the institution of coinage from the rulers whose power they had destroyed. The earliest money of the new nations was entirely composed of direct, and not always very skilful, imitations of the imperial currency. This was partly because the barbarian chiefs sometimes chose to maintain the fiction that they were merely the vassals of the Emperor of the East, partly because they were aware that their own issues were more likely to be readily accepted if they conformed in outward appearance to what the mass of the population had for generations been accustomed to use. Even after a certain amount of independence had been developed, the confusion that the Empire had bequeathed showed no sign of passing away. On the contrary, once the restraining hand of a centralized control had been removed, the evil tended to become more and more sharply accentuated. The number of persons in whose names coins were struck multiplied rapidly ... Delegation of authority was the pivot on which the whole of that system turned, and the multiplication of mints by which its development was attended did not, therefore, imply—in theory at least—any breach of the cardinal principle that the right of striking money was an attribute of the sovereign power. In point of fact, the penalties that

waited on transgressors were more severe now than at any other period of the world's history . . . A similar desire for self-assertion was unquestionably operative in the case of the feudal lords generally, but in the majority of instances, there was a baser motive present too. The business of minting could be made personally profitable, if one chose to play fast and loose with the responsibility which the possession of the right implied. The usual practice was to call in the current issues from time to time, or to collect a supply of pieces struck by a neighbour, and adulterate the metal or reduce the weight, and then give out a larger number of coins than had been originally received, the nominal value of each being the same but the intrinsic worth considerably less. This money the people had perforce to use, except in so far as they were able to transact business, as they did to a certain extent, through exchanging actual commodities. The hardships they endured in consequence are testified to by many contemporary witnesses. And there were various aggravations. Minting authorities often made exorbitant charges under the guise of dues. Again, bad as the money was, worse was frequently imported from abroad. Lastly, there was 'clipping', a species of fraud which consists in paring the edges of coins in circulation, in order to accumulate silver.

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