METALLIC VALUES  
AND EXCHANGE VALUES

i. METALLIC EQUIVALENTS AND LINK COINS

In the eighteenth-century, arguments about whether the dollar was a bimetallic standard illustrate the difficulties that can arise in determining the metallic equivalent of a particular money of account at a particular time. Calculating the metallic equivalent of a money of account centuries ago in a country where several moneys of account had been in use during decades of changes in trimetallic coinage is unavoidably complicated. 1

Estimates of metallic equivalents are needed, however. 2 The monetary regulations in a city such as Venice cannot be understood without considering how the men making the regulations thought their coins were related to their moneys of account. Also, any comparison of prices at different times is likely to be very misleading if it does not consider whether or not there were changes in the meantime in the metallic equivalents of the moneys of account in which the prices were recorded. And comparisons of prices in different places, or any other international monetary comparisons, are meaningful only if the metallic equivalents are also

2 On the general problem of converting prices from money of account into their equivalents in pure silver see Aldo De Maddalena, Prezzi e aspetti di mercato in Milano durante il secolo XVII (Milan, 1949), 62–66; see 73–79 for his solution.
compared, unless, to be sure, records of exchange rates are available. For most of the Middle Ages and for most places, records of exchange rates are not available, and when they are, they merely add a new dimension. The relation of metallic values to exchange rates then becomes one of the major problems in monetary history.

In seeking metallic equivalents, one encounters the problem of allowing for the deterioration of coins through use, clipping, and culling. The difference between the weight legally prescribed for the mint and the average weight of those in circulation was frequently 10 percent and could be much more, as illustrated in chapter 4.

For most of the Middle Ages most calculations can be based on the legally prescribed weight because so many payments, especially large payments, were made not by counting coins but by weighing them. Especially in the eastern Mediterranean and southern Italy many mints made little effort to issue coins that were all of the same weight. An extreme example, not typical but illustrative of possibilities, is the tari of the kingdom of Naples and Sicily: some monarchs issued some tari that were eight times as heavy as others. As a result, a unit of weight, the ounce (uncia) became the money of account, and although it was divided into 30 tari of account for fractional calculations, the number of actual tari coins needed to make an oncia was determined by weighing, not by counting, coins. At Constantinople the bezant, or perpero, was based on Byzantium’s traditional chief coin, but contracts often specified those of the “old” or of the “correct” weight. The money of account referred to a coin of a legally prescribed weight, although most of those in circulation were lighter. In such cases the design that distinguished one coin from another was supposed to indicate a uniform content of gold or silver but did not guarantee a uniform weight.

In northern Italy and western Europe, however, efforts were made to manufacture coins that were all of the same weight. The range of variation permitted in minting was smallest for the most precious coins, those of gold. Until 1321 Venice permitted its silver coins of high reputation, its grossi, to be used in making payment by weighing them. Although in their manufacture specialized craftsmen were employed in efforts to make them all of equal weight, in fact many of those circulating were so far underweight, presumably from clipping, wear and tear, and culling, that when payment by tale was made obligatory in 1321, creditors were obliged to accept at full value any grossi that were not more than 10 percent underweight. That would seem to raise the question, Was the

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4 *PMV*, doc. 79; and below, chaps. 13, sec. iv, and 14, sec. i.
silver equivalent about 1300 of a lira di grossi 240 times the fine silver content legally prescribed for the grosso, namely, 504 grams (240 \times 2.1) or somewhere between that figure and 10 percent less? The relevance of the question may well depend on the problem being investigated. In regard to the bimetallic ratio in Venice in the 1320s, some of the very high prices for gold at that date may need to be discounted to allow for the deterioration of the grossi in actual use in those years. An example in England of extreme variation in barley prices in 1299–1300 is explained by Michael Prestwich as partially the result of the circulation at the time of much lightweight foreign coin.\(^5\)

Determining which was the link coin on which a money of account was based is relatively easy if in such sources as account books one coin was always given the same value in the money of account, while other coins were valued variously from time to time. As is obvious from the simplified examples given in chapter 4, coin of which the value in the money of account was invariable was the basic, link coin.

But that leaves open several questions:

1. What if the records repeatedly name as constant in value a coin that was not in use at the time? In that case, one possibility is that an amount of gold or silver in a coin no longer in use is the basis of the money of account. A debtor could call for payment of that amount of precious metal. Although it was known that the coin was no longer available, its metallic value still determined the metallic value of that money of account. It might be called a bullion-based money of account.\(^6\)

For such a bullion-based money of account, it is often necessary to identify the coin no longer in use that determined the amount of metal the user of the money of account had in mind. Some coins of relatively high value that enjoyed a high reputation either because of the prestige of the government that issued them or because for a long time they had been maintained at a high standard were sufficiently memorable that they, as ghosts, provided an unchanging bullion base for long-lived moneys of account. Their weight and fineness can be learned from surviving specimens or possibly from documents.

2. What if a coin’s name was a word that did not refer to any coin? It was a misnomer if it had come to be used merely as a designation of a denomination in a money of account. An example is the word grossi as used about 1500 in the Venetian lira di grossi, where grossi does not refer to current coins of that name or even to the coins from which the

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\(^6\)This type of money of account is called Type A by Hans van Werveke in “Monnaie de compte e monnaie réelle,” 123. Examples are the écus of Philippe of Valois and Louis of Bavaria. Cf. J. P. Cuvillier, “Notes on the Royal Coinage.”
expression originated. “Grosso” had become a denomination of account meaning 1/24 of a ducat; a “lira di grossi” in 1500 meant, not 240 grossi coins, but 10 ducat coins.\textsuperscript{7}

In such a case the fact that “grosso” had an invariable value in the accounting tells nothing about the metallic equivalent of the money of account. That metallic equivalent has to be sought through the entries that refer to coins, not to mere denominations of account. Ducats were real gold coins. Equating the lira di grossi of that date with 35.5 grams of gold is an acceptable inference from the constancy with which 1 ducat containing 3.55 grams of gold is equated with 2 soldi of the lira di grossi.

3. What if the evidence from account books and from the administrative or legislative records is unclear and somewhat contradictory? In that case it is essential to compute the metallic content of all the coins that were in use and to compare their relative metallic values and their relative legal values. It is useful to take as a preliminary hypothesis the belief that the coin that was most overvalued legally was the basic coin. Unless there is reason to believe the contrary, it is reasonable to conclude that the basic coin was the coin of which the metallic value was lowest in relation to its value as legal tender when making payments recorded in that money of account.

The reasonableness of this conclusion can be made clear by reconsidering the simplified example described in the discussion in chapter 4 of how changes in coinage produced new moneys of account. Suppose pennies that were worth 1 denaro each and had previously contained 1 gram of silver each were debased to contain 0.8 grams, while groats worth 12 denari continued to be coined containing 12 grams of silver each. Before the debasement of the pennies, either 20 groats or 240 pennies—in either case 240 grams of silver—had been worth 1 lira of account. If the legal value of the coins was left unchanged, after the pennies were debased to contain only 0.8 grams of silver the lira could be paid with only 192 grams of silver (240 × 0.8) when paid in pennies, while 240 grams would still have been required legally to make the payment in groats (20 × 12). Under these conditions, the merchant who had incurred a debt of 1 lira had reason to pay it in pennies, and the creditor would be obliged to accept the payment in settlement of the debt, since the pennies were legal tender for 1/240 of a lira. Groats would then command a premium, and pennies would become the basic link coin of the money of account.

Further questions arise when such analysis leaves two or three coins with equal claim to be the link coin for the same money of account, as when both or all three have invariable values in the entries in an account book.

\textsuperscript{7}See below, chap. 16.
a. There is no problem if the two or three coins were of the same metal and fineness and their differences in weight corresponded to their differences in value, as did the English groats and shillings when they were minted to supplement the English penny. The metallic equivalence of the denominations of account are the same whichever coin is used in the calculations.

b. If two coins, one of silver, the other of gold, both appear to be established by law as link coins for the money of account, as a silver one-dollar piece and a gold ten-dollar piece were for the U.S. dollar in 1792, it is pertinent to inquire whether both coins were in fact commonly used at those values in making payments, as would be the case if there was effectively a bimetallic standard, or whether at the time being studied the gold coin or the silver coin had practically disappeared from circulation, as was the case in the United States in the 1850s, so that although the monetary standard was by law bimetallic, it was in practice monometallic. If in the period being studied the payments recorded in the money of account were in fact being made practically all in one kind of coin or the other, then the coin actually in use should be used in calculating the metallic equivalent of the money of account at that time.

c. The most difficult cases are those involving two or more coins, some of fine silver; some of billon; and some with a silver content, placing them on the border line between white money and black money. Such cases arise when account books and administrative records show that pennies and groats were both accepted for years at unvarying values. It is then necessary to amend the preliminary hypothesis formulated above according to which the coin with the lowest metallic value compared with its legal value is to be considered the link coin. It has to be amended to say that the coin with the lowest market value compared with its legal value is to be considered the link coin. The amendment is necessary to take into consideration that the market value of the black money was almost always higher than its metallic value.

One reason why the market or exchange value of black money was normally higher than its comparative metallic value was the higher cost of manufacture. The cost of the copper was relatively unimportant because a pound of silver was worth more than a hundred times as much as a pound of copper. But making black money worth 100 soldi took more labor than did making white money of the value of 100 soldi. Accordingly, even when the percentage of seigniorage on the two kinds of coins was the same, the mint charge for manufacturing billon pennies was about 6 percentage

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8 Martin, "1853: The End of Bimetallism," 826.
9 On copper prices see below, app. C.
points above the mint charge for manufacturing groats of pure silver, about 8 percent instead of 2 percent, at least in that proportion.\textsuperscript{10} In comparing the values of the two kinds of coins, the value of the large amount of labor that was embodied in the pennies should be added to the value of the silver they contained. Their added labor cost was a part of a coin's intrinsic value in the literal sense of \textit{intrinsic}, but since that word is customarily used to refer to the metallic value of a coin, the full intrinsic value will be referred to below as the "cost value" (cost value = metallic value + cost of manufacture).

Quite distinct from the cost value thus defined was the exchange value, commonly called the market value. The exchange value was affected by such extrinsic factors as utility or scarcity and by custom or official values.

More often than not, the exchange value of billon and copper coins was higher than their cost value. They met a demand for coins to use for small payments or charities, as well as in making change. For such purposes coins of pure silver were impractical. Copper had to be used in order to make a coin of small denomination large enough to handle. Once people were used to such a coin, the demand for it gave it a value far above its intrinsic worth, provided it was not issued in too large amounts. Since their market value depended on supply and demand, billon coins could and generally did circulate at more than their cost value.

In this respect, black money resembled the coins of base metal that in a modern monetary system are defined as "token coinage." Token coins now are legal tender for small sums only but can be exchanged at government agencies and at government expense for currency of larger denomination that is fully legal tender. Early attempts to issue token money had limited success. The cost of redeeming such tokens at face value was excessive, and the very idea of token money was contrary to the prevailing commodity theory of money and to princely expectations that coinage should produce revenue, not add to governmental expenses.\textsuperscript{11} All things considered, medieval coins of low metallic value are best described not as token coinage but as subsidiary coinage serving the functions later served by token coinage.

Billon coins were kept in a subsidiary position and above their intrinsic value most of the time by the inconvenience of using them in large payments and by the coinage of a relatively small amount compared with the need. The inconvenience is evident if one imagines counting out the number of Venetian piccoli required about 1500 to pay the sum of 1 lira di

\textsuperscript{10}Usher, \textit{The Early History}, 198–201; Bernocchi, 3:38–40; and for the comparative mint charges at Venice see below, chap. 18, sec. i, and app. A.

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grossi: 14,880 piccoli.\textsuperscript{12} Payments with large numbers of small coin could be made—and in one period in Venice were made—by preparing them in paper packages!\textsuperscript{13} But that was a sign of the very unsatisfactory state of the coinage.

The most important reason why black money was confined as much as it was to a subsidiary position in the thirteenth and fourteenth centuries was the failure of mints to turn out more of it. Thus it had scarcity value. Moneyers much preferred making the more highly valued silver coins. Both moneyers who were entrepreneurs operating mints and craftsmen who shaped and struck the coins objected to turning out coins of low value, from which they gained little, considering their labor and the number produced. Left to themselves, they would not have produced as many as were needed. Mints met the public demand for such coins only when governments required them to do so, either by contracts or by minting regulations.\textsuperscript{14} They produced excessive amounts only when governments tried to add to their income from seigniorage by ordering both large production and the acceptance of the billon coins at legal values far above their cost of production.

Seigniorage was rooted in the ability of governments to have coins accepted at the values officially set. Seigniorage may be regarded as an appropriation by governments of all or part of the value the coin derived from being both useful and of limited quantity. Those qualities affected a coin's exchange value, and a government's monopoly of the right to determine official values as legal tender enabled it to take a kind of monopolist's profit, which was one of the elements represented in the exchange value.

In calculating the relation of black money to the metallic equivalent of a denomination of account, allowance must be made for both the cost value and the scarcity value of the billon coins. A minimal value for a billon coin can be calculated from its metallic content, but its maximum value might be much higher. For example, if a penny contained $\frac{1}{36}$ as much silver as a groat, a moneychanger was fairly sure to offer a groat for 36 of them. On the average he would probably offer a groat for 34 pennies because the large costs of labor in minting pennies raised their intrinsic value to $\frac{1}{34}$ that of a groat. And if pennies were in short supply, he might well give a groat for 32 pennies. His decision was also influenced by the values prescribed by law and the extent of the laws' enforcement. In short,

\textsuperscript{12}At that time the metallic base of the lira di grossi a oro was 10 ducats and the value of the ducat in silver or billon coin was stabilized at 124 soldi. $10 \times 124 \times 12 = 14,880$.

\textsuperscript{13}Papadopoli, 1:383 n. 5; Reinhold C. Mueller, “L'imperialismo monetario veneziano nel Quattrocento,” Società e storia 8 (1980):288 n. 21, which also describes fifteenth-century limitations on their use as legal tender.

\textsuperscript{14}Usher, The Early History, 198; Spengler, “Coin Shortage”; Spufford, Monetary Problems and Policies, 44–45; and below, chap. 10, sec. v.
four kinds of value—metallic, cost, official, and utility or scarcity—are worth distinguishing in explaining a fifth value, exchange value.

Efforts to have a single unified monetary standard that was bimetallic or trimetallic were affected by these labor costs and scarcity values. Compared with their exchange value, gold coins cost less to make than did silver coins. A bimetallic ratio calculated from a mint’s prices for gold bullion and silver bullion was higher than the ratio calculated from the gold and silver content of coins. A difference of 2–3 percent could result from a difference between the manufacturing costs of gold and silver coin. Larger differences were created when a government set seigniorage high or low so that the total mint charge would increase its revenue or attract more of the desired kind of metal, either gold or silver.\(^{15}\)

Even more allowance for the lower mint charge on gold must be made in comparing billon coins in order to discover the bimetallic ratio prevailing in a particular period, since minting billon cost more than minting fine silver.\(^{16}\) In Venice and Florence the distinction is usually clear: black money contained less than 25 percent silver—generally much less—while white money was almost always more than 90 percent fine. Silver made into billon coin gained more in exchange value than silver coined into grossi. But the problem is complicated in many places by the lack of a clear distinction. Any coin containing less than 50 percent fine silver may be called billon,\(^{17}\) and in Flanders, for example, many coins had a silver content ranging between 25 percent and 80 percent.\(^{18}\) At Venice, such coins of intermediate fineness, important for a time in adjusting to rapid changes in the relative value of gold and silver, were minted only for some fifteen years in the mid-fourteenth century.\(^{19}\)

Other factors also determined the immediacy of effects of changes in

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\(^{15}\)Francesco Casaretto, *Le monete genovesi in confronto con le altre valute mediterranee*, in Atti della Società Ligure di Storia Patria, 55 (Genoa, 1928), chap. 6 and p. 174 n. 2. Casaretto compared silver values and exchange values of coins in the twelfth century and estimated that the difference was highly variable and as much as 25 percent for Genoese silver or billon coins and only 2–3 percent for gold coins. He estimated, accordingly, that the billon coin exchanged for gold coin at a price 20 percent above that at which silver bullion exchanged for gold bullion (p. 63). But for coins of fine silver the difference was less. The estimate of a difference of 2–3 percent is based partly on the differences in mint charges on gold, fine silver, and billon as tabulated in Bernocchi, 3:38–40, and partly on the implications of decrees of the Venetian Senate analyzed below in app. C.

\(^{16}\)Cf. the bimetallic ratios given in table A in Bernocchi, 3:302–3.

\(^{17}\)Grierson, *Numismatics*, 193.


\(^{19}\)The only such Venetian coins produced before 1500 were the soldino (0.670 fine) and the mezzanino (0.780 fine), minted between 1331 and 1347 (see chap. 15, sec. iii and app. A, sec. vi).
bimetallic ratios or the introduction of new coins. Most of all, a legally overvalued coin cannot safely be considered the link coin determining the metallic content of the money of account unless there is evidence that it was also “the real coin which at the time predominated as the means of cash payment in the particular line of business and therefore was the coin referred to explicitly or implicitly in setting prices” (Zerbi’s definition of what he called moneta numeraria).20

ii. NEW LINKS FOR MONEYS OF ACCOUNT

Although the libre, solidi, and denarii used in Western Christendom in the year 1000 referred to moneys of account based on the denarii derived from the Carolingian monetary system, by 1300 so many other coins had come into use and the denarii were so debased generally that the old moneys of account had become linked more tightly to other coins. The English development, however, was unique in this respect, because English pennies (i.e., denarii) continued to be made of fine silver during the centuries in which those on the Continent were being debased. Even in the fourteenth century, except in a very few years, the English penny’s fineness was maintained, and its weight was not substantially reduced until mid-century.21 When larger English silver coins were issued—groats in 1279, shillings in 1504—they were also of sterling fineness and were made exactly 4 or 12 times the weight of the penny. Until the late seventeenth century the English £, s., and d. constituted a money of account based on the silver coins of that integrated series. When gold coin began circulating extensively, the gold pieces were given various values in that money of account. The gold coins, insofar as they were made legal tender, were generally undervalued until gold began to fall in value compared with silver about 1690. For some years around 1700 the largest silver coin, the sovereign, was worth 20 shillings, and the most used gold coin, the guinea, was worth officially first 22 shillings and then 21 shillings, 6 pence. For decades England in effect used a bimetallic standard.

When that bimetallic standard disintegrated, the result was a monometallic standard which, rather surprisingly, turned out to be a gold standard. As supplies of gold increased, it became clear that the guinea was overvalued. Isaac Newton, in a famous report submitted when he was director of the mint in 1717, calculated accurately the extent to which gold coin was then overvalued. As a result, the guinea was revalued to 21 shillings. Contrary to what Newton had expected, it kept that value when gold continued to fall in value during the rest of the century. The silver

20Moneta effettiva, 18; and cf. 74.
21Feavearyear, The Pound Sterling, 350; and a table kindly furnished by John Munro, “The Alterations of the English Coinage, 1279 to 1526.”
content of 21 shillings became worth more abroad than the gold content of 1 guinea, although it was worth less than that in England. Large silver coins disappeared from English circulation as silver was shipped to India, while gold was arriving from Brazil. Practically, England shifted to a gold standard a century before the fact was given legal recognition in the Act of 1819, when specie payment was resumed after the Napoleonic Wars. Thus England kept its single monetary standard in spite of changes in the coins used.

In contrast to the unity of money of account preserved in England, a multiplicity of moneys of account developed in the Italian cities—even within the same city—even before they had begun coining gold. Venice’s money of account was based on both a billon penny and a groat of fine silver in the first half of the thirteenth century. If billon and fine silver are considered two separate metals, as they are by some scholars, Venice then had a bimetallic standard. When that standard broke down, diversely based standards emerged to distinguish a standard of value based on the billon penny and a standard based on the silver groat. The money of account based on black money was called the “pound of small pennies” (lira di piccoli) to distinguish it from newer moneys of account called a “pound of groats,” or more literally translated, the “pound of large pennies” (lira di denari grossi), and a “pound paid in large pennies” (lira a grossi).

Later—much later in some places—as the metallic value of piccoli became infinitesimal, all moneys of account became linked to newer coins of higher value than 1 piccolo, even the money of account that kept the name lira di piccoli. Indeed, long before piccoli coins had gone out of use, the word piccoli had taken on a new meaning. It was used to designate a denomination in a money of account: that is, in many usages it was understood that the word piccoli denoted not the coins that were called by that name but a subdivision of the lira, namely, 1/240 of a lira, the value of which depended not on the piccolo coin but on some other coin. To be sure, which meaning the word had is doubtful in some cases in the fourteenth century, but there are innumerable instances in later centuries when piccoli in “lira di piccoli” did not refer to coins in use.

In Milan and many other cities of northern Italy the money of

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23 Jacob Viner summarized the situation thus: “England . . . although legally on a bimetallic basis had for some time been in effect on a gold standard basis, since the mint ratio of silver to gold was such as generally to undervalue silver and keep it out of circulation” (Studies, 123, citing R. G. Hawtry, Currency and Credit, 3d ed. [1928], 320–32).

24 Feavearyear, The Pound Sterling, 2.

25 See below, chap. 8, sec. iii.

account derived from the pennies coined since Carolingian times by imperial mints was called the lira imperiale, divided into soldi and denari imperiali. Originally the metallic equivalent of that lira had been the content of 240 denarii, but before the end of the thirteenth century the denarius had become so debased that the metallic equivalent of the lira imperiale depended instead on that of larger coins such as the sixpence (sesino), which was about 50 percent silver, and the groat (grosso), of higher fineness, worth 24 denari imperiali. A different money of account based on a kind of half-penny called the terlino or terzuolo was also used, but it was stabilized with 2 lire terzuolo consistently worth 1 lira imperiale. After the gold florin had been given varying values in the lira imperiale for decades, and then stabilized at 32 soldi imperiali for quite a while, it became the basis of another money of account (as explained below in chapter 19, section iv).

In Florence a multiplication of moneys of account began very soon after the minting of gold. At first, in minting the gold florin in 1252, Florence created a bimetallic standard by giving the gold florin the same value as 20 of the silver groats, also called florins at that time, each of which was worth 1 soldo. A single denomination of account, the lira, then equaled both 1 gold florin, containing 3.55 grams of gold, and 20 silver florins, each containing about 1.59 grams of silver, a bimetallic ratio of 8.96 to 1. That bimetallic standard was extremely short-lived, however, for gold soon rose in value, and two moneys of account based on two quite distinct standards of value were used. A money of account based on the gold florin was adopted for big business affairs, officially and in practice. A money of account called the lira di piccioli was used in local trade and became linked to both billon and silver coins. There was no stable market value or legally declared relationship tying the gold florin and the silver coinage into a single standard of value, for the price of the gold florin in lire and soldi di piccioli fluctuated freely and frequently in response to market conditions.

In Venice, a similar separation between the money of account based on gold and that based on silver or billon developed more slowly and intricately but was clear-cut by the early fifteenth century. (That separation will be explained in detail below, in chapter 16.)

In Milan, Florence, and Venice, the simultaneous use of both a money of account based on gold and a money of account based on silver led to adoption of a standard way of expressing the value of the gold

30Bernocchi, 3:76–79, 139–68, 263–68.
TABLE 2.

Coins Issued by Louis IX of France, 1266

<table>
<thead>
<tr>
<th>Coin</th>
<th>Weight</th>
<th>Fineness</th>
<th>Value in Money of Account (deniers tournois)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denier</td>
<td>1.13 g</td>
<td>0.299 (0.338 g silver)</td>
<td>1</td>
</tr>
<tr>
<td>Gros</td>
<td>4.22 g</td>
<td>0.958 (4.04 g silver)</td>
<td>12</td>
</tr>
<tr>
<td>Ecu</td>
<td>4.20 g</td>
<td>1,000 (4.20 g gold)</td>
<td>120</td>
</tr>
</tbody>
</table>


money compared with that of the silver money. This domestic exchange rate consisted of the fluctuating price of the florin or the ducat stated in the silver-based lira di piccoli. Sometimes and in some places, such as Milan, domestic exchange rates were occasionally decreed by government authorities, but in other cities, most notably Florence, they were set by market action and then officially and regularly registered. The term “domestic” (as used in appendix D) serves to distinguish those quotations of local moneys from the rates of foreign exchange, that is, from the prices of foreign moneys in local moneys of account (and of local moneys in foreign moneys of account).

In France, the pennies (deniers) that had been the basis of the livre tournois, the most used money of account, were so debased by the time of Louis IX that they were 2/3 copper. In his reform of 1266, Louis coined a groat, famous as the gros tournois, which was 96 percent pure silver, and an écu of almost pure gold. He linked all three coins to the livre tournois, with 1 livre tournois equal to 80.8 grams of silver or 8.4 grams of gold (see table 2).

Some years later we find the gros worth 13 deniers and Louis’s écu, because of the rise in the value of gold, worth much more than 120 deniers. What then determined the metallic value of the livre tournois? Seemingly the denier, because 240 deniers were still counted as 1 livre. But the gros seems to have acquired the value of 13 or 13 1/3 deniers tournois without any alteration of its silver content, and it was the gros that became the basic or link coin of the livre tournois. Only the higher labor value of the denier and its utility in small payments for a time enabled both the gros and the denier to function as basic coins in the trimetallic pattern set by Louis IX.31

The manipulation of the coinage under Philip IV complicated the French system. Beginning in 1295 he raised sharply the rating of such coins as the gros and the écu in the money of account. Then he lowered the amount of fine metal in the silver and billon coins. In 1306 the debased issues were cried down to lower values in livres tournois, and coins of "the good old" standard were issued.\(^\text{32}\)

In the innumerable subsequent changes, French monetary ordinances employed for all the silver and billon coins a formula that produced a figure called the "pied de monnaie." It expressed the legally stipulated relation between the weight of a coin, the proportion of fine silver it contained, and the legal value assigned the coin. This gave a unified monetary standard, because the relation was the same in coins of both high and low denominations if they were minted with the same pied de monnaie.\(^\text{33}\)

Its use did not solve the problems created by many devaluations. The pied de monnaie was changed frequently, especially in the periods of disaster during the Hundred Years' War. The higher the pied de monnaie, the lower the amount of silver represented by a livre tournois. It became necessary to specify at a particular time whether the livre tournois being used was based on those current coins with a high pied de monnaie or those with a low pied de monnaie. Restorations of the currency were called a return to the good money of St. Louis, and although these revaluations did not raise the metallic standard quite that high, they made it high enough to make worthwhile distinguishing it from the debased money it was supposed to replace. That distinction created two concurrent kinds of livres tournois, "monnaie forte" and "monnaie faible." One is tempted to say that there was "no fixed rate of equivalence between coins in use and money of account."\(^\text{34}\) At least monnaie forte and monnaie faible


\(^{33}\)The formula is \(P = TC/\pi t\), where \(T\) is the number of coins cut from a mark, \(C\) is the legal value of the coin, \(\pi\) is the fineness, and \(P\) (the pieds) is \(1/5\) the value in sous tournois of the coins obtained from a mark of silver argent le roi, i.e., 0.958 fine (Fournial, *Histoire monétaire*, 30–31, 135. Wolff, *Commerce et marchands de Toulouse*, 303–13, gives the clearest explanation. See also Miskimin, *Money, Prices, and Foreign Exchange*, 32–33).

METALLIC VALUES AND EXCHANGE VALUES

changed their metallic values whenever a revaluation or devaluation changed the pied de monnaie.

More similar to the developments in Italy was the creation later in France of new moneys of account named after the gold coins on which they were based. Their subdivisions were given the names of silver coins, but the values of these subdivisions depended on the gold coin. For example, the écu became a money of account based on the gold coin bearing the imprint of a shield. It was divided into 18 gros, of which the value had no fixed relation to any coin called a gros but was instead always 1/18 of the value of the golden écu.35

In the busiest monetary center of the north, Bruges, in the county of Flanders, a fief of the king of France, the money of account most used in the thirteenth century was the “livre parisis,” which was tied to the French livre tournois (1 d. parisis = 1.25 d. tournois). But Flanders was practically independent, and by 1317–19 its livre parisis became tied to a Flemish “groot,” with 1 groot equal to 12 deniers parisis. Soon, a money of account more obviously linked to the Flemish groot, the pound groot (that is, 240 gros), became the most used in Bruges and also elsewhere in the Low Countries.36

Black moneys underwent a kind of resurrection as link coins in some countries in the fifteenth or in the sixteenth century, when for fiscal reasons they were coined in excessive quantities and given value as legal tender higher than their metallic value. When white money was scarce and black money plentiful, black money operated as bad money according to Gresham’s law, driving out coins whose silver content was worth more than their legal value. As larger and larger quantities of black money were issued by princes desperately short of funds, the money of account based on the black money declined more and more from the values it had had as long as the issue of black money had been limited. A value higher than its metallic equivalent had depended on the basic coin’s having been issued in limited quantity, and the extent to which it lost value depended on the amount of overissue.

In the latter part of the fourteenth century, both white and black money were much debased in Flanders. Although the groot was established as the link coin of the pound groot, much black money was accepted at values above its metallic worth. In commenting on that situation, one

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THE BACKGROUND

expert on Flemish coinage, Herman van der Wee, emphasized that the market value of copper coins could differ from their low metallic value to such an extent that the metallic content did not determine the value of a money of account based on such coins. When black money drove coins of fine silver out of circulation, the value of the money of account, according to his interpretation, “was then determined by the value attached to the money remaining in circulation, . . . i.e., the inflated black money.” Its silver content was so heavily overvalued that linking it with the money of account on the basis of its intrinsic silver value was impossible. The situation became comparable, writes van der Wee, to an “inflation of what we would call fiduciary money.” Then its value did not correspond to its metallic content, “just as in the case of an inflation of paper money the value of the money of account is not determined by the price of the paper material.”

Similarly, Ugo Tucci, describing the debasements in Italy, says that the black money became a kind of fiduciary money.

The value of the money of account in those circumstances depended largely on the quantity issued, that is, on the number of the base coins in circulation, as does the value of modern fiduciary money. That idea was not unknown to medieval shopkeepers and moneychangers, as Carlo Cipolla has shown in his analysis of the legislation at Florence in 1378–82. When the lower middle and working classes of Florence desired to lower the value of the gold florin compared with that of the quattrino, the black money in which they received payment (or rather the base coin of the money of account in which their payment was calculated), they voted to retire from circulation and melt down a stipulated number of quattrini every two months until the florin fell from 75 to 70. The scheme did not succeed, in part because the Florentine currency probably became permeated (anew) by Pisan quattrini, which flowed in to replace the Florentine quattrini withdrawn, and in part because of the strong opposition of the

37 Herman van der Wee, in his critical review of Raymond de Roover’s The Bruges Money Market around 1400, in Business History Review 43 (1969): 375. While de Roover characterized black money as token money (p. 38), he also called it a “perpetual threat to the stability of medieval currency systems.” Yves Renouard, “Le commerce de l’argent au Moyen Age,” Revue historique 203 (1950): 41–52, reviews—and follows—de Roover. Peter Spufford, Monetary Problems and Policies, 40, analyzing an inflation in the Netherlands later in the century, says that the money of account then became based on the black money, not on the better silver coins. He considers the money of account “securely anchored” to the black money, which he calls a “third metal, ‘bad’ silver.” He does not say how much pure silver was represented by the units of account or what the bimetallic ratio was between “‘bad’ silver” and better silver, nor does he discuss the possibility that the relative value of the black money depended less on its metallic value than on the quantity circulating.

38 Ugo Tucci, “Le monete in Italia,” in Storia d’Italia, vol. 5, I documenti (Turin, 1973), 568–70. The basic general issue, namely, the relation between the values of moneys of account and the metallic content of coins, is reconsidered below, in chap. 20.
upper classes, who restored oligarchical rule in early 1382 and hastened to
repeal the deflationary law. 39
The extent to which the values of moneys of account in the late
medieval and early modern periods came to depend less on the metallic
content of particular coins and more on the quantity of coins issued and
on the faith people had in the money will be examined from a different
angle below, in chapter 20.

iii. HABIT VERSUS CALCULATION

While mintmasters and moneychanging bankers figured down to
small fractions the changing content of the moneys in which they dealt,
most everyday usage was governed by ignorance and custom. As W.
Stanley Jevons wrote more than a hundred years ago, when gold and
silver coins were still in use, “The great mass of the population who hold
coins have no theories, or general information whatever, upon the subject
of money. They are guided entirely by popular report and tradition. The
sole question with them on receiving a coin is whether similar coins have
been readily accepted by other people. . . . By far the greater number of
people possess no means of learning the metallic, or even the legal, value
of an unfamiliar coin. Few people have scales and weights suitable for weigh­
ing a coin and no one but an assayer or analytical chemist could decide on
its fineness. . . . People in general accept coin simply on the ground of its
familiar appearance.” On the other hand he also wrote: “Though the
public generally do not discriminate between coins and coins, provided
there is an apparent similarity, a small class of money-changers, bullion
dealers, bankers or goldsmiths make it their business to be acquainted with
such differences and know how to derive profit from them.” 40

For the history of money in Venice, or in any country, a persistently
recurrent problem is discerning the effects of these two contrasting at­
titudes: that of what Jevons called “the great mass of the population” and
that of the “small class who make it their business to be acquainted
with . . . differences of fineness and weight.” The problem is all the more
persistent because the contrast was not absolute in practice. No clear-cut
line separated the “mass” from the “small number.” Some differences
between coin and coin could be detected by the eye, by ringing, or by
biting. Visible insignia were much more important to some people than to
others. Coins accepted in some social circles and for some uses might be

39 Carlo M. Cipolla, Il fiorino e il quattrino: La politica monetaria a Firenze nel 1300 (Bologna,
1982), 98–103.
rejected in other circles or for other uses. Custom ruled in some situations, rational calculation in others; but a few generalizations may be hazarded.

The coins of small denomination were those most ruled by custom. Their metallic value was normally lower relative to the costs of their manufacture than was the case for coins of larger denomination. They passed most rapidly from hand to hand, suffered most from wear and tear, and were the least affected by international trade balances. They were the most expensive to melt or to export, especially if the export was forbidden, as it was in most countries. Only if the market price for silver bullion rose very far indeed above the mint price would it pay to cull them for export. But once their use had become customary, they could circulate domestically at a legal value far above their intrinsic or metallic worth.

Did the force of custom enable coins of larger denominations also to circulate at traditional and legal values far above their metallic worth? To the extent that it did so, custom overrode the commodity conception of money and turned coins into a kind of fiduciary money. Coins were accepted in payment because of the receiver's _fiducia_ that he would be able to make payments with them.

This was a new, third level of faith in "money." At the first level, represented by the first coins, faith in the fineness of the metal was all that was asked for by the imprint placed on it by the authority who minted it. The amount of the metal had to be determined by weighing the coins. At a second level, coins could be counted out with faith that they were of a standard weight, at least approximately. At the third level, coins were accepted, not because of faith in the amount of precious metal they contained, but because of faith that they could be used to make payments similar to those in which they had just been accepted.

Just when that third level of faith was attained is disputable. Opinions vary on the extent to which coins were accepted at legal or customary values above their intrinsic values in medieval and early modern Europe. On so broad a question it is not surprising to find contradictory evidence. One indication of the relative force of faith or custom versus that of calculation is the behavior of prices when the metallic equivalents of the moneys of account were reduced, either by crying up the link coins or by reducing the amount of silver in the coins. After a detailed study of the reaction of grain prices to such devaluations in fourteenth-century France, Harry A. Miskimin concluded that changes in metallic value were quickly reflected in prices—a triumph of calculation over custom. But that was "certainly not true in 1303" nor of land rents generally, commented Joseph Strayer, and efforts of the king's agents to prevent prices from respond-

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41 _Money, Prices, and Foreign Exchange_, 61–64; he also concluded that "prices existed in many currencies simultaneously."

42 In his review of Miskimin's _Money, Prices, and Foreign Exchange_, in _JEcH_ 24 (1964): 409.
ing to changes in the currency were sometimes quite successful later in the century, according to R. Cazelles.\textsuperscript{43} In the much later debasement of the coin in England begun by Henry VIII, perhaps the most thoroughly studied example, not all prices rose in proportion to the decline in the metallic value of the currency.\textsuperscript{44} Miskimin’s flat statement that “since all money was taken and given as metal, it was presumably all equally good” does not apply universally.\textsuperscript{45} Sometimes some prices responded quickly to changes in the coinage, sometimes some prices did not. A comparison of cases suggests that much depended on the people’s recent experience. Many rapid changes in the content and official values of coins destroyed a people’s faith in what the government declared to be the value of its money, as happened in some decades in fourteenth-century France. On the other hand, when the content of coins and their values had been fairly constant for a generation or more, custom had more power. Then custom supported the people’s faith that they could use the money they accepted in payment to make payments of equivalent value themselves. Such faith gave coins some of the characteristics of fiduciary money.

\textit{iv. PAPER MONEY AND BANK CREDITS}

If pieces of metal were accepted at values determined not by their content but by their imprint, why could not the government issue pieces of paper that would be accepted in payment at values determined not by their content but by their imprint? In the seventeenth and eighteenth centuries governments began to do exactly that in effect, but the first widely accepted paper money depended as much on faith in bankers as on

\textsuperscript{43}In his “Quelques réflexions,” 255.

\textsuperscript{44}J. D. Gould, \textit{The Great Debasement: Currency and Economy in Mid-Tudor England} (New York and Oxford, 1970), 86, concluded that “it is not true either that the proportion in which coinage was debased invariably reflected an equiproportional increase in the supply of money, or that the increase in the supply of money necessarily resulted in an equi-proportional rise in the price level.” Such specific price series as those for grain, masons’ wages, and cloth behaved differently. And “coins of differing de facto mint equivalents circulated . . . at the same level of value.” Similar conclusions were reached by Christopher E. Challis, “The Circulating Medium and the Movement of Prices in Mid-Tudor England,” in \textit{The Price Revolution in Sixteenth-Century England}, ed. Peter H. Ramsey (London, 1971), 117–46. Regarding England in 1690, Horsefield (\textit{British Monetary Experiments}, 26) says: “Clipped coins in use circulated at their full nominal value.”

\textsuperscript{45}Money, Prices, and Foreign Exchange, 117. In the same summary section, entitled “Not a Conclusion,” he also wrote: “These facts would seem to eliminate Gresham’s law as the instigator of coinage movements,” a statement that also seems too sweeping or at least much subject to misinterpretation, even if one grants what seems to be his main point, that international arbitrage based on comparison of mint prices for bullion was not the “instigator of currency movements” (Cf. Harry A. Miskimin, “L’applicazione della legge di Gresham” [Paper presented at the fourth “Settimana di Studio” of the Istituto Internazionale di Storia Economica “Francesco Datini,” Prato, 1972]; and above, chap. 4, n. 9).
faith in governments. The bank notes issued by the Bank of England bore not the imprint of the royal ruler but the bank’s promise to pay.\textsuperscript{46} When the Bank of England was founded in 1694, bankers’ promises to pay had been serving as an important means of payment for three or four centuries, most notably at Venice. Venetian bankers’ promises had not taken the form of paper money that passed from hand to hand. Instead, sums owed by a banker as recorded on his books had been transferred upon oral order from one creditor to another. While coin dominated in small transactions, bank credits had become the form of money most extensively used in big commercial and governmental operations.

True banking had developed, it is now generally agreed, not from moneylending or pawnbroking, but from the manual exchange of coins.\textsuperscript{47} The local moneychanger turned banker was often the principal supplier of bullion and scrap coin to the mint, and it was often he who first received and first handled the imperfect products of the mint’s craftsmen. It was he who had the first chance to cull overweight coin; who knew both local and foreign coins of whatever sort better than did any other merchants, as well as the moneys of account based on them; who could distinguish legitimate from counterfeit coins; and who knew bullion prices and domestic and foreign exchange rates and how to profit from differences between and among them. It was the local banker, accordingly, who was able to impose some kind of order in the confusion arising from an endless variety of coins and from multiple moneys of account. While receiving coins in deposit, he created a substitute superior to specie for many purposes, namely, bank money.

The banker created this surrogate for specie in the following manner. He accepted good, bad, and average coins and sorted them out with two purposes in mind. In order to determine how much he would credit the depositor, he assessed their weight and fineness and evaluated them in a money of account, discounting some because they looked worn or sweated and perhaps allowing a premium on heavy specimens. He knew that he could later find occasion to put some light coins back into circulation, while those that were too mutiliated or too obviously clipped could be sold by weight to the mint at the price of bullion. The heaviest coins he

\textsuperscript{46} Although the issue of bank notes by the Bank of Stockholm occurred earlier, the issues of the Bank of England gained much wider circulation (Shepard T. Clough and Richard T. Rapp, \textit{European Economic History}, 3d ed. [New York, 1975], 187–92). The bills of credit issued by the Province of Massachusetts in 1690 and then widely imitated in other colonies were a slightly earlier form of paper money, less acceptable in European financial centers than on the rapidly growing frontier, where the needs for new forms of money as means of payment were greatest (Richard Sylla, “Monetary Innovation in America,” \textit{JEH} 42 [1982]:23–26; for the multiplicity of forms invented in the Colonies, see William Letwin, “Monetary Practice and Theory of the North American Colonies during the 17th and 18th Centuries,” in Barbagli Bagnoli, ed., \textit{La moneta nell’economia europea}, 439–69).

\textsuperscript{47} See below, chap. 6, n. 45.
put aside, perhaps to be sold later at a profit or exported. His total evaluation of the coins received, arrived at in agreement with the depositor, he registered in his books in the denominations of the most prestigious local money of account. That credit to the depositor’s account constituted a claim to ownership of the value of the deposit, an amount the banker was obligated to pay to its owner on request. He could pay either by giving back specie or by adhering to an order from the depositor to transfer the claim to another party. The claim could—and did—become a means of payment when the depositor transferred all or part of the claim to a third party. That third party obviously had to agree to accept the banker’s promise to pay. His faith—his *fiducia*—in the solvency of the banker and thus in his ability to convert the claim into cash on demand made the claim fiduciary money in the current sense—a means of payment based on a promise.

Faith in a banker’s promise, as well as the possibility of avoiding the cost and loss of time involved in evaluating the various kinds and qualities of coins that made up any payment in cash and the possibility of avoiding the headache involved in calculating continuously the relationship between coin and money of account, helped the banker to wean his clients away from the use of specie and to accustom them to leaving their deposits as much as possible intact in order to utilize them for making payments by transfer of the claim from account to account on the banker’s books. The facility and security that his service offered enabled the banker to concentrate in his hands both the circulating capital of businessmen and the savings of commercially inactive persons. The banker, or more correctly the banking system, thus functioned as a socializer of the liquid wealth of many different persons and acted as a clearing house and as a common bookkeeper for the entire business community. Since the banks had to retain only a fractional cash reserve in order to meet daily demand, they contributed to the transformation of wealth into productive capital by lending the excess reserves to other businessmen and by investing directly in commerce and manufacture.

It is well known that within a banking system bank loans can have the effect of creating money or credit, via the mechanism of multiple

expansion.\textsuperscript{49} The extent to which banks in medieval and early modern Europe created credit is even more obscure than the extent to which today’s banks do so. The inference that they did create credit, that is, that they did expand the money supply beyond the total value of coins issued and circulating, is based on the proven existence of certain essential preconditions: bankers operated on a system of fractional cash reserves; they granted lines of credit to individuals, companies, and governments, often in the form of bank money; they sometimes monetized government debt in this way; and finally, they were welded into a banking system by a more or less functional arrangement of interbank accounts.\textsuperscript{50}

Moreover, the factor of credit creation, combined with the cost of “telling” the coins at the time of deposit and withdrawal, and the tendency for the demand for coin to exceed supply at least occasionally contributed to the tendency of bank money to separate from its metallic base and to become a new standard of value, as well as a separate means of payment. Businessmen therefore sometimes specified whether a payment was to be made by transfer of bank money or in cash. Bankers could turn the differential, or “agio,” between full-weight coins and bank money into a source of profit.

In the market places of medieval and early modern Europe, banks and the means of payment that they created played an important role in mediating and facilitating transactions. Even though bank money circulated primarily by oral order and therefore almost exclusively in the local market place, it helped to overcome the inconveniences caused by the at best unpredictable availability of good coins. The easily transferable bank deposit or claim, registered in a widely used money of account, was the forerunner of the bank note.

\textsuperscript{49}The theoretical maximum expansion of credit is the reciprocal of the reserve ratio, so that a reserve ratio of 1 to 3 can lead to a threefold expansion of the money supply (see, for example, Lester V. Chandler, \textit{The Economics of Money and Banking}, 3d ed. [New York, 1959], chap. 5).

\textsuperscript{50}de Roover, \textit{Money, Banking, and Credit}, chap. 13, “Bank Deposits As Money,” and p. 320. For a contrary opinion see Ederer, \textit{The Evolution of Money}, 113, 116, 121, where the definitions are extremely restrictive.