

**The Debasement Puzzle:
an Essay on Medieval Monetary History***

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Abstract

This paper establishes the stylized fact that medieval debasements were accompanied by unusually large minting volumes and revenues. This fact is a puzzle under the commonly held view that metallic coins are commodity money and exchange by weight. An existing explanation is that debased coins were used to reduce the real burden of nominally denominated debts. This explanation is logically flawed: nothing prevents agents from renegotiating contracts and avoid incurring minting costs. The paper also establishes other facts about monetary mutations, which altogether pose a challenge to monetary economics.

Introduction

Sometimes, lest worse befall and to avoid scandal, a community tolerates dishonorable and evil things, like brothels. Sometimes also, by necessity or convenience, vile business is tolerated, like money-changing, or evil business, like usury. But there seems to be no reason on earth why so much gain should be allowed from alteration of the coinage for profit.

— Nicole Oresme, *De Moneta*

When Henry VIII ascended to the throne of England in 1509, £1 contained slightly less than 6.4 Troy ounces of pure silver. Starting in 1542, he began a series of debasements—reductions in the metal content of the currency. These lasted until 1551 and became known as the Great Debasement. Each of these debasements was accompanied by a large volume of minting activity and raised a substantial amount of revenue for the Crown. By the time Henry and his son, Edward VI, stopped altering the coinage, £1 contained less than one ounce of silver. During the Great Debasement, the Crown raised considerably more revenue in this manner than at any other prior time: the Mint represented one of the major sources of revenue for Henry VIII, on a par with the sale of confiscated monastic estates.

This phenomenon was not unique to England; several other European countries had similar experiences. Between 1290 and 1450, France experienced several episodes of large debasements of its coinage, and each raised significant revenues for the Crown. Other countries, such as Spain, the Low Countries, Italy also underwent such episodes.¹ The experiences of these countries are all consistent with the following stylized fact: debasements are accompanied by unusually large minting volumes that yield unusually large revenues for the sovereign.

The institutional aspects of minting were similar throughout Europe during this period. Metal (in the form of silver and gold bullion, plate, or old coins) was brought *voluntarily* to the mint. The mint operated as a government monopoly, and levied a charge for coining, a tax which is known as seigniorage. It retained a portion of the metal and returned the rest, in the form of coins.

In this context, the stylized debasement fact is difficult to explain if one takes the commonly held view that silver and gold coins are commodity money. For if such coins are valued for their intrinsic content (which requires that agents are able to ascertain that content), then one would expect them to exchange according to their weight: the heavier coins commanding a premium over the lighter ones. Since debasements are just an opportunity offered to change heavy coins into light ones, they can provide no *additional* incentive to bring metal to the mint. Yet, as noted, debasements did in fact attract a lot of metal. In a commodity money regime, therefore, large minting volumes following a debasement appear as a puzzle. The puzzle, of course, is not why sovereigns carried out debasements (in fact, it might even be why they did not do so more often), but rather why did private agents respond so.

The puzzle is compounded by the fact that the charge for coining usually increased considerably after a debasement. Given large minting volumes, this helps explain the large revenues collected by the mint, but it makes the volumes themselves even harder to explain. Individuals submit voluntarily to a tax to a much greater degree even as the tax rate increases.

One explanation which has been proposed is that debasement provided debtors with

¹ See Hamilton, *Money, Prices*; Munro, *Bullion Flows*; Cipolla, *Monetary Policy*.

an opportunity to legally reduce the real burden of their debt, even if coins were valued for their intrinsic content in most other transactions. That explanation suffers from a logical flaw, since it does not explain why debtors and creditors could not come to an arrangement and by-pass the sovereign altogether.

Rejection of the money rents explanation presents a modeling challenge: solving the debasement puzzle, which may offer new insights into the reasons why people use and hold money. While we cannot offer here a solution, we present three additional stylized facts about minting and circulation of coins in that period. The first is that both old and new coins circulated side by side following debasements. The second, which is particularly well established for gold coins, is that old and new coins were valued in circulation by their intrinsic content (circulation by weight) rather than by their legal tender value (circulation by tale). The third and perhaps most surprising, is that minting volumes after *reinforcements* of the currency (the opposite of debasements) were also unusually large, about as large as after debasements. We think that these additional facts will, a priori, restrict the kind of models that can be proposed to solve the debasement puzzle.

The paper proceeds as follows. We first present a brief overview. Next, we establish the general features of debasements, using evidence from England and France. We then state the challenge to monetary theory, presenting in addition three additional stylized facts that characterize debasement periods.

Review of Medieval Monetary Institutions

During the Middle Ages, the monetary system consisted of gold and silver coins. Silver coins, which had been in use since Roman times, were joined in the late medieval period by gold coins (1252 in Italy, 1266 in France, 1351 in England). In France (as in Italy), small quantities of silver were also alloyed with copper to produce billon, from which small coinage (black or petty money) could be made in a convenient size.

The unit of account, derived from Roman times, was the pound (*livre*), divided in 20 shillings (*sous*) and 240 pence (*deniers*). Originally, the unit of account expressed physical quantities of metal, but by the late medieval period the two were distinct concepts.

Coins were produced by mints.² By the late 13th century, all mints within a given political entity were under direct control of the sovereign. The mints were run as businesses by private entrepreneurs, who leased the mints for fixed terms. The leases were often auctioned off to the highest bidder, that is, the bidder promising the highest minting volume. The physical plant and large capital equipment were provided by the sovereign. Individuals (goldsmiths, money-changers) could come to a counter at the mint and deliver their metal in the form of bullion, old coins, goldware or silverware, and they would be paid back, within a few weeks, in newly minted coins of the same metal (gold or silver) as they brought.³ They always received back less (fine) metal than they brought. Part of what was withheld by the mint paid for production costs and the rest was sent to the king as “profit” or tax. This tax was called seigniorage, although for practical reasons we will include production costs in seigniorage in our discussion.⁴

A king, when sending minting instructions to his monetary officers, specified the characteristics of the coins to be minted. A particular coin was defined by its type (that is, the imprint it received during the mechanical process of minting), its weight and its fineness.

² See Saulcy, *Recueil*, vol. 1, pp. vii–xvi; Blanchet and Dieudonné, *Manuel*, vol. 2, pp. 7–20; Spufford, *Mint Organization*.

³ Occasionally, the mint purchased silver bullion with gold coins, for example in 1359–1360 and in 1420 in France.

⁴ In most countries, sovereigns had progressively eliminated private mints, and by the 14th century the seigniorage tax was a monopoly profit.

The *legal tender value LTV* of a coin was the official number of units of account per coin, set by the king. During the Middle Ages, the type did not bear any indication of legal value, but coins with different weight and fineness usually had distinguishing features.

The *mint equivalent ME* of a coin at a given date is the ratio of that coin's legal tender value *LTV* to its gold or silver content *C*. It represents the number of units of account that the mint "produces" per unit of weight. The *mint price MP* is the number of units of account per unit of weight which the mint is willing to pay individuals in exchange for metal. *Seigniorage* (gross of production costs) is simply the difference $ME - MP$, withheld by the mint. It is expressed in units of account per unit of weight. The seigniorage rate is $1 - MP/ME$.

A *mutation* is any change in *ME*. It can occur with a change in *LTV* or in *C*. Fixing the type but altering either weight or fineness alters the metallic content of the coin. Altering the type amounts to creating a new coin.

Enhancement or *crying-up* consisted of raising the *LTV* of an existing coin, holding *C* fixed; *crying-down*, on the other hand, consisted of lowering the *LTV* (when it was set to 0, the coin was decried and the coin ceased to be legal tender). This was a mere matter of decree.

A decrease in *C* is called *debasement*.⁵ An increase is called *reinforcement*.⁶ Debasement could occur in two ways: by alteration of an existing coin or by introduction of a new coin, with a new type and a higher *ME*. Both methods were used, but even when the existing coinage was altered, a change in fineness and even in weight was indicated by a small change in the design of the coin, such as a dot under a specific letter of the legend in France.⁷ In principle, debasements could be carried out in secret, since the orders were

⁵ We thus define debasement as an operation on a coin. In Italy, one coin might be debased while other coins of the same metal were left unchanged. In French and English practice, the whole denomination structure for a given metal was changed proportionately in the course of a debasement, so that we can think of debasements as operations on the currency.

⁶ Reinforcements always occurred with the introduction of a new coin, usually distinctive and with high fineness. Reinforcements are often described in the literature as "currency reforms."

⁷ The mark was called a *différent* and its use was almost always specified by the king when he sent his minting order: see Blanchet and Dieudonné, *Manuel*, vol. 2, p. 57. Out of the hundreds of debasements that occurred since Philip the Fair, Jean Lafaurie, *Monnaies*, reports only 14 instances where no mark of difference was used in a silver coin (five cases in 1359 and 1360, the rest between 1419 and 1422), and in only three cases was the fineness altered without changing the weight. For gold, one coin in 1388 was debased by weight with no mark of difference.

not publicized, and the mint officers were sworn to secrecy.⁸

As far as we know, metal was brought to the mint voluntarily, even during periods of debasement. This is explicitly true for the Great Debasement from 1542 to 1551 in England: Lord Jenkinson states: "As the old Coins were brought in voluntarily, it was not thought necessary, on these occasions, to issue a proclamation for calling them in; nor have I found any proclamation for that purpose."⁹ Measures were sometimes taken to promote reminting. In France, for example, the king sometimes ordered his officers or his subjects to bring in their gold-ware and silverware.¹⁰ Moreover, when a coin was no longer legal tender—as often happened during reinforcements, its only legal use was to be brought to the mint for reminting. But coins were rarely decried except during reinforcements. It remains doubtful that the king had much power to enforce these laws.

⁸ In practice, the debasements could not be kept secret for long. Only debasements where the fineness alone was modified, and where the mint price did not change concurrently, stood a chance of being kept secret; but such debasements were quite rare, as can be seen in Tables 9 and 11, where they are marked with a + sign. In such cases, the instructions sent to the mintmasters would often require them to keep the alteration of coinage secret (5 instances for gold, 15 instances for silver, all between 1348 and 1360). Sometimes, a lag between the announcement of the change in mint price and the actual (secret) debasement was purposely introduced, which indicates that merchants took changes in the mint price to be an indicator of a possible debasement. In other cases, a new coin was announced with an official fineness, and the fineness was secretly modified a few weeks later. How closely the secret could be guarded is difficult to say, but it is unlikely that money traders and bullion merchants could have been fooled very long or very often. The speed at which debasements followed one another suggests no more than a few weeks, if at all. See Saulcy, *Recueil*, for details.

⁹ Jenkinson, *Treatise*.

¹⁰ See Landry, *Essai économique*, p. 109, n. 4.

The Stylized Fact

Most of the debasements that occurred in France and England between 1300 and 1600 took place during periods of financial difficulties. Available data on minting volumes in the Middle Ages show that debasements were usually followed by greatly increased activity. Debasements were also accompanied in most cases by increases in the seigniorage rate. As a result, we find that seigniorage, most of the time a trivial source of revenue, becomes significant after debasements.

A Brief History of the Currency in England and France

In France, the silver currency went through 123 debasements between 1285 and 1490 (Appendix). Of these, 112 reduced the silver content of the currency by more than 5%. The single largest debasement reduced it by 50%. Gold coinage changed comparatively less in the same period: there were a mere 64 debasements, of which 48 were by more than 5%.¹¹ Some of these debasements can be followed in Figure 1. These plots depict the minting volume of silver and gold in France between 1354 and 1490; years of debasements greater than 5% are indicated by vertical half-tone stripes. Reliable data is not available prior to 1354.

Compared to France, England enjoyed monetary stability. English debasements appear again as vertical stripes in Figure 2, which depicts the minting volumes of silver from 1220 to 1599, and gold from 1344 to 1599, including the Great Debasement. While debasements occurred for both gold and silver during the 14th and 15th centuries, they were far less frequent than in France. Seigniorage rates always remained low, debasements occurred at long intervals, and the pound sterling never lost more than 20% at a time.

This reign of monetary stability ended with Henry VIII, who began in 1542 what is now known in England as the Great Debasement. During the following 10 years, gold or silver were debased 10 times and the pound sterling lost 83% of its silver content. The seigniorage rate went from 2% to 58%. Yet the volume of minting was so large that the single mint at the Tower of London was not enough, and the King had to open six new mints. The increase in volume is quite noticeable in Figure 2.

¹¹ Gold was sometimes cried up to match a silver debasement: this is the case for nine debasements.

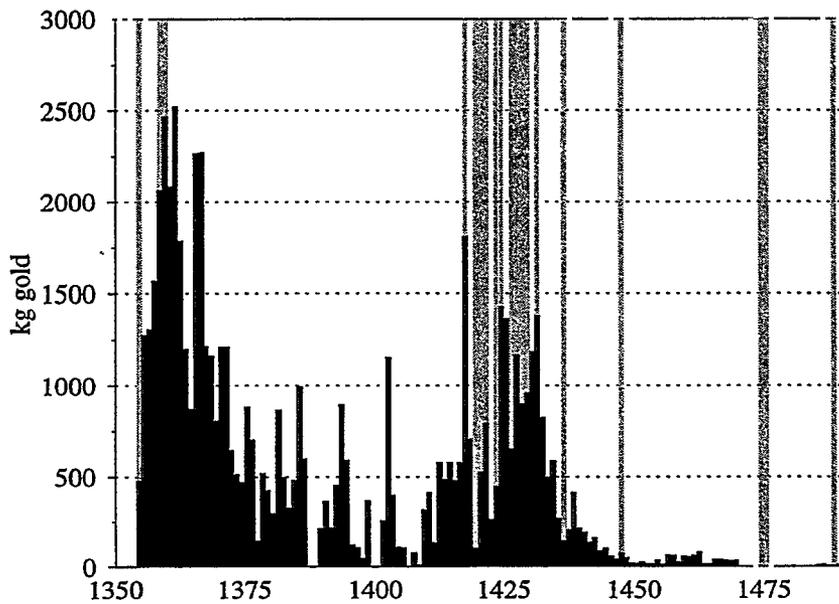
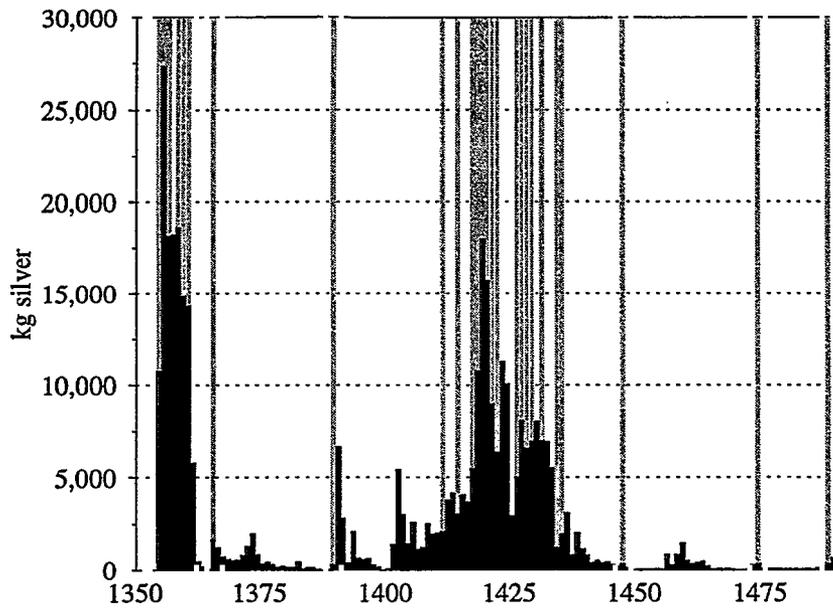


Figure 1: Silver and Gold output of the French mints, 1354–1490. Vertical stripes indicate years in which a debasement greater than 5% took place. Source: Saulcy, *Recueil*, Miskimin, *Money, Prices, and Money and Power*, Sussman, *Missing Bullion*.

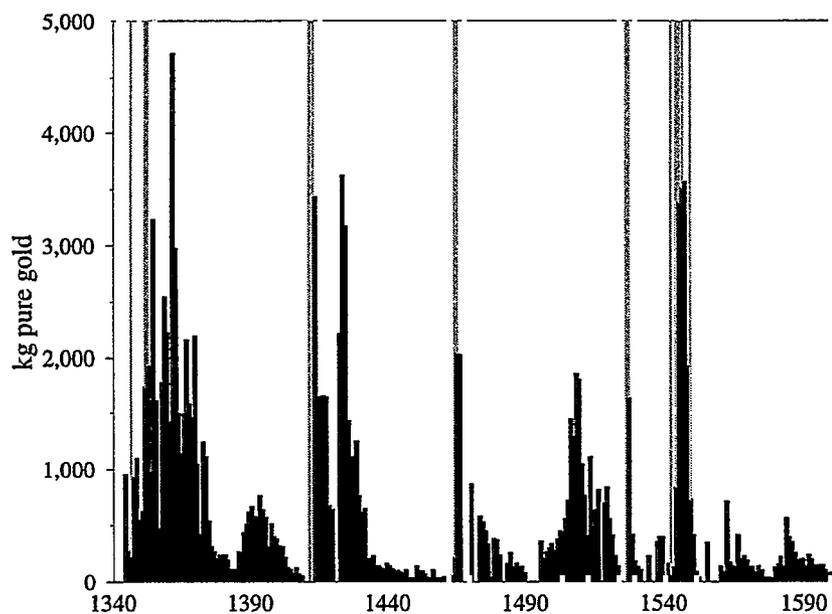
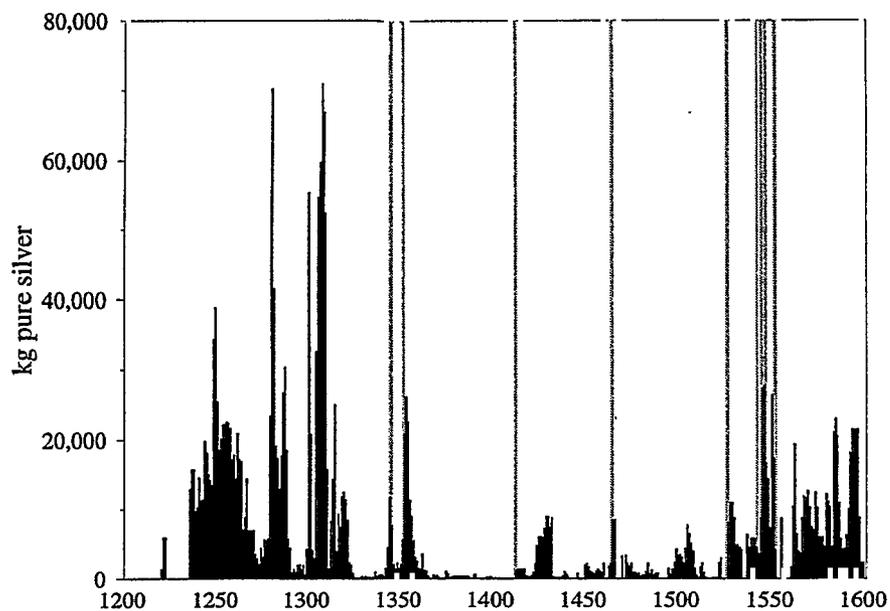


Figure 2: Silver and Gold output of the English mints, 1220–1599. Vertical stripes indicate years in which a debasement greater than 5% took place. Gold was not minted prior to 1344. Source: Challis, *Appendix 2*.

Some Numbers

Figures 1 and 2 suggest that large debasements were followed by unusually large minting volumes that yielded unusually large revenues for the sovereign, but they are only suggestive. We now take a closer look at the data to establish the stylized fact. We use different methods for France and England because the nature of the data is different.

Using the data for France on an annualized basis as in Figure 1 is problematic for two reasons. First, the frequency of debasements and reinforcements was such that we could not usefully define “debasement years.” The minting volume for a given year comprises normal coins, debased coins and reinforced coins. Furthermore, over 20 mints operated in France, and we have output reports for various mints at various times, although no series is continuous for any one mint. Mints carried out debasements over differing periods, and sometimes a subset of mints would operate under different mint equivalents than the rest. When the reports are available, we do know how many coins were minted at which mint equivalent, so that we can distinguish between “debasement volume” and the rest. Reasonably complete minting data are available for several French mints. As a result, we have proceeded mint by mint, and computed monthly volumes of debasement coinage and non-debasement coinage. Debasement coinage is defined as follows: when a debasement has occurred, we count as debasement coinage all coins minted at the new *LTV* in the following 12 months or until another mutation occurs.

Table 1 reports the results for the most productive mints: for silver, ten mints account for 70% of the known volume between 1354 and 1490, while for gold five mints account for 68%.¹² For silver, the increase in volume following debasement is quite clear.

¹² Some caveats must be made about the French minting data. Miskimin, *Money, Prices and Money and Power*, has constructed series for the 14th and 15th centuries. We choose 1354 as our starting date since the data is too fragmentary until that date. But other problems beset the data. It is apparent that some regional mints are not well represented in the series. Sussman, *Missing Bullion*, has supplemented Miskimin's series and we have used those numbers as well. Even corrected, the output series are likely to be incomplete. For example Vuitry, *Études*, vol. 2, p. 326, shows that 90,000 marcs of silver were minted in Paris, Tournai, Saint-Quentin and Angers between 1370 and 1379. None of these mints are represented in Miskimin, *Money, Prices*, Appendix D for that period (in fact, Paris does not appear between 1353 and 1405). Adding Vuitry's numbers would multiply the mean output of those years by 4. Similarly, Saulcy, *Recueil*, vol. 3, documents many leases in the late 15th century for a number French mints which specified minimal output quantities, with severe penalties for falling short. Yet there are no mint reports for these mints. Bearing these points in mind, our feeling is that the output series we use provide a good picture of the time profile of minting activity. In particular, coverage during and after debasements is fairly complete for those mints that are represented. Our discussion bears on these patterns of activity, rather than on the absolute value of total output, which is likely to be under-estimated for France in that period.

Mint	Share of Output	Debasement		Non-Debasement		Ratio
		Number of Months	Mean Monthly Output (kg)	Number of Months	Mean Monthly Output (kg)	
Gold						
Paris	18.9%	32	84.7	412	28.7	3.0
Tournai	15.4%	0	n.a.	108	62.1	n.a.
Montpellier	14.9%	34	16.4	522	27.3	0.6
Toulouse	14.3%	49	20.6	475	19.4	1.1
Troyes	4.8%	16	7.4	185	9.7	0.8
Silver						
Toulouse	11.2%	146	132.6	374	67.4	2.0
Romans	9.8%	93	108.7	790	30.7	3.5
Troyes	9.7%	89	115.4	359	63.8	1.8
Poitiers	7.7%	69	232.6	74	198.8	1.2
Rouen	6.4%	45	373.7	39	228.2	1.6
Crémieu	5.5%	90	83.8	452	37.8	2.2
St.Pourçain	5.4%	70	190.5	83	100.9	1.9
Tournai	5.3%	0	n.a.	87	87.0	n.a.
Montpellier	4.8%	73	89.6	497	25.0	3.6
Dijon	4.5%	34	316.6	247	27.7	11.4

Table 1: Minting Volumes in Debasement Months and Non-Debasement Months, Selected Mints, France (1354–1490). The share of each mint in the total minting output for that period is indicated. Source: as in Figure 1.

For all mints except one, the ratio of debasement average to non-debasement average is 1.6 or higher. An average of these ratios, weighted by shares in total output, is 2.0. For gold, however, the picture is less clear. While the Paris mint shows a ratio of 3, the other mints show ratios of 1.1 or less.

For England, we have annual series for the whole of the country, and the series are shown in Figure 2. The debasements are usually distinct enough that a comparison between output before and after debasement is possible. This is done in Figure 3, where we show the minting of silver and gold in the five years preceding and the five years following each of six debasements. The year in which the debasement occurred is labeled year 0.

Table 2 presents the summary statistics, with the known volumes minted in the three years prior and subsequent to debasements. The contrast between the output figures is quite sharp. Gold minting is almost always at least twice as large after debasements, and for two periods minting volume goes up by a factor of thirty. The increase in silver minting following debasements is even more dramatic. In all cases, it increases by a factor

Debasement Period	Gold Minting (kg):			Silver Minting (kg):		
	Before	After	Ratio	Before	After	Ratio
1344				1544	4578	3.0
1346	603	848	1.4			
1351	673	1645	2.4	2011	16049	8.0
1412	58	1991	34.3	11	1966	172.5
1464	41	1410	34.5	1748	6572	3.8
1527	179	491	2.8	2745	8220	3.0
1542	322	1453	4.5	5735	15603	2.7

Table 2: Minting Volumes in 3-Year Periods before and after Debasements, England. Source: as in Figure 2.

of at least 2.5, and following the debasement of 1412 it increases by a factor of 172.¹³

We have also examined seigniorage rates for both France and England during the same period. The increases in minting volumes appear to have coincided with increases in seigniorage rates.

Figure 4 depicts the seigniorage rates for gold and silver in France.¹⁴ Note that gold was subject to fewer changes, and the ‘normal’ seigniorage rate was near 1%, close to production costs. Silver, even in normal periods, was taxed more heavily, between 5 and 15%; but, during debasements, the seigniorage rate reached 50% and stayed above 15% even as it fluctuated wildly.

In England, we find that the rates are much more stable than they were in France, but the same pattern emerges with substantially higher rates of seigniorage during debasement periods. In Figure 5 we see that the debasement of 1464 was accompanied by an increase in the seigniorage rate on both metals. The Great Debasement stands out with extraordinary rates, reaching 60% on silver.

We have stated that the revenues collected during debasements were large. There are two ways in which one might define “large”: in comparison with non-debasement years,

¹³ We have also considered minting data from the Low Countries (1334–1495) from Miskimin *Money, Prices and Money and Power*. The mean gold output was 925 kg in debasement years against 496 kg in non-debasement years. The contrast for silver output is not as sharp: 5400 kg in debasement years against 5100 kg in non-debasement years.

¹⁴ Our seigniorage rate in fact includes both minting costs and pure seigniorage. For France, we do not have series on the minting costs, but we know them to be quite small as well; for example, in 1401 they were around 3% for silver and 0.5% for gold, see Saulcy, *Recueil*, vol. 2, p. 113.

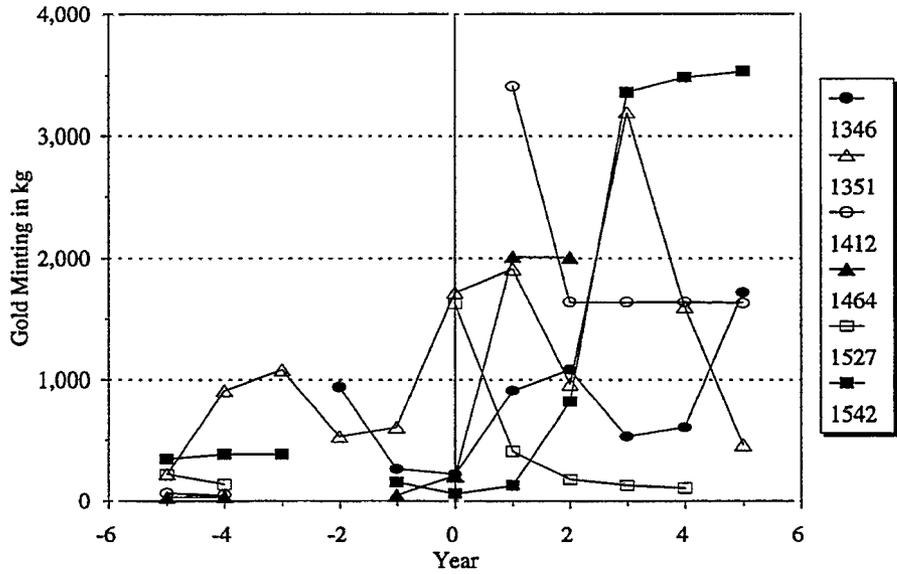
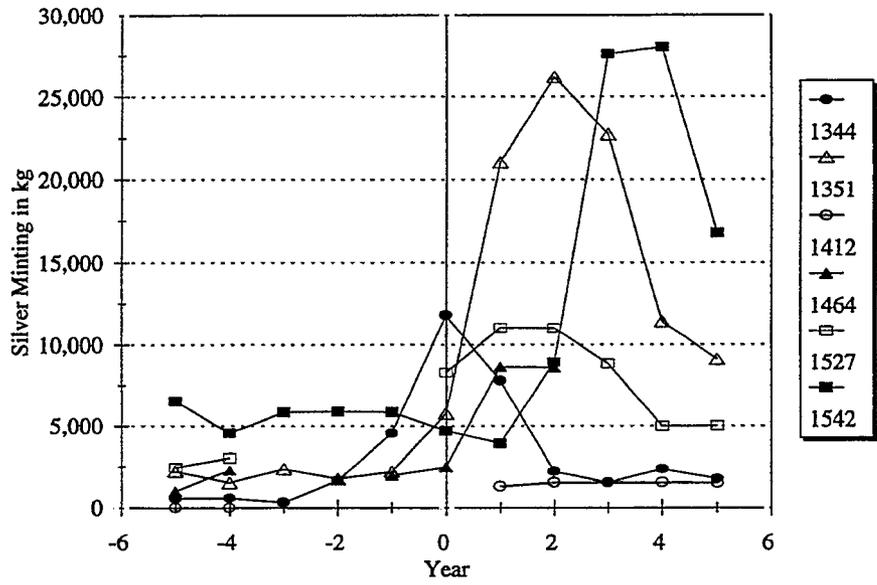


Figure 3: Comparison of Minting Volumes Before and After Debasements, Silver and Gold, England.

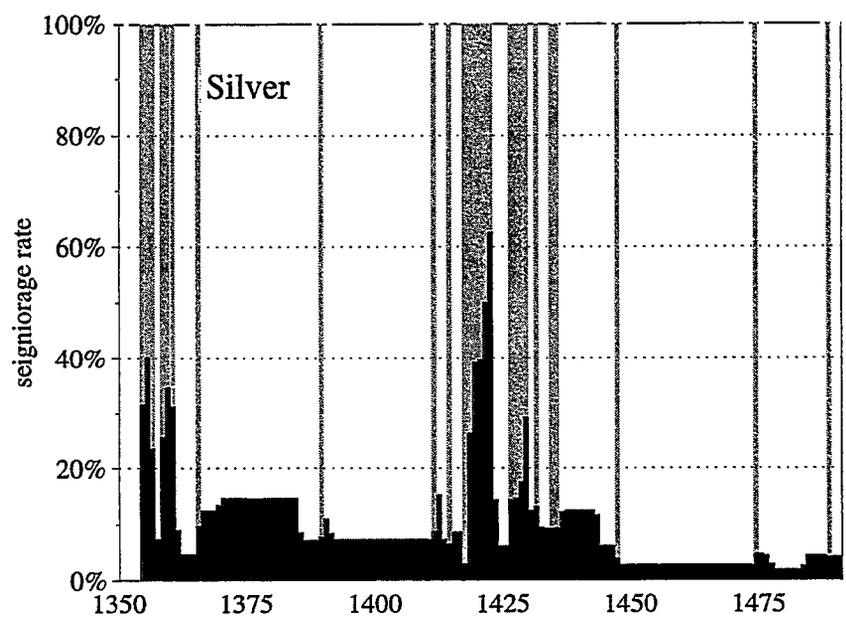
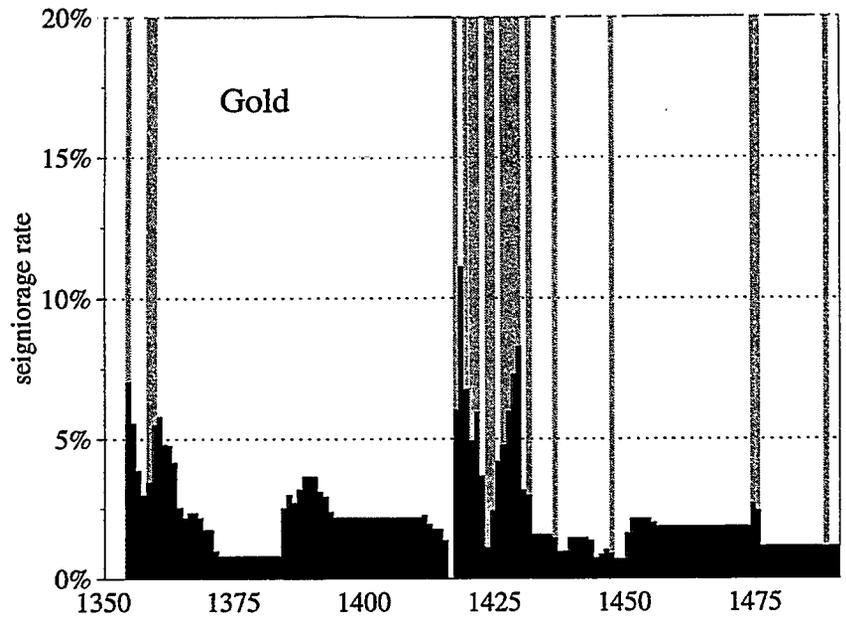


Figure 4: Rate of Seigniorage on Gold and Silver (if unavailable, Billon), France, 1354–1490. Vertical stripes indicate debasement years as in Figure 1. Source: Appendix.

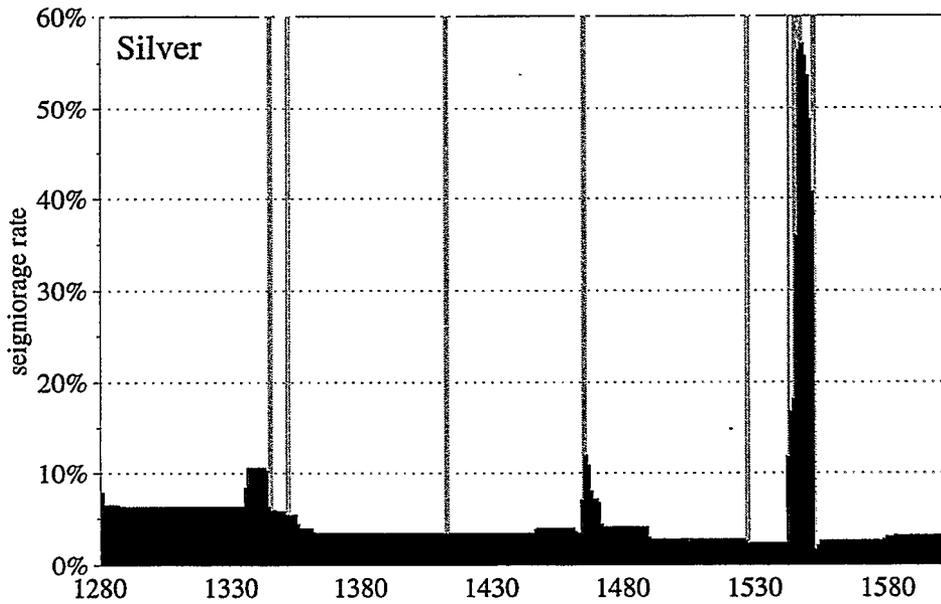
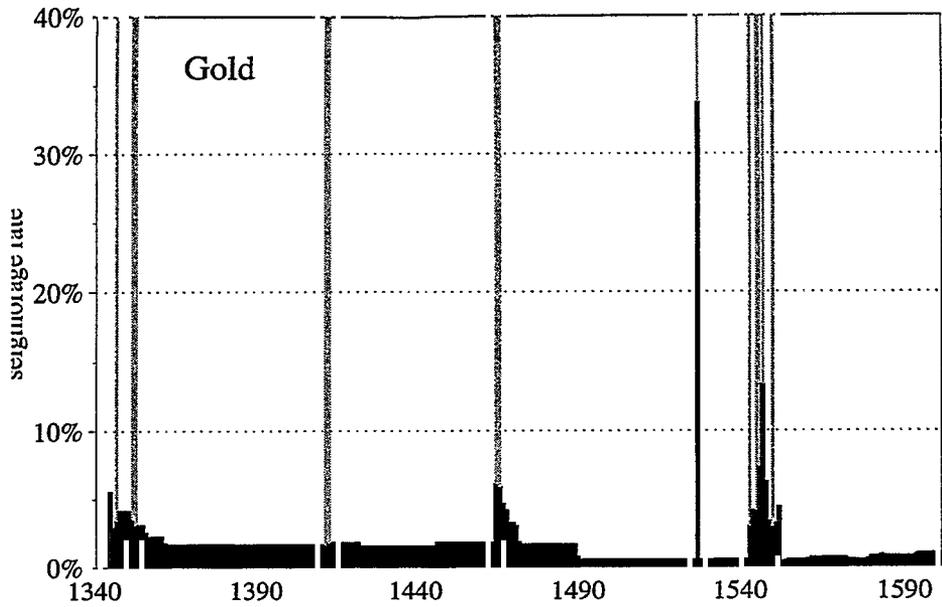


Figure 5: Rate of Seigniorage on Gold and Silver, England, 1280–1599. Vertical stripes indicate debasement years as in Figure 2. Source: Appendix.

Period	Annual Revenues ('000lt)			Period	Annual Revenues ('000lt)		
	Total	Mint	Ratio		Total	Mint	Ratio
1286-1287	756.2			1354-1360*		97.7 ^a	
1289-1290	936.3					162.5 ^b	
1299*	1965.0	978.7	50%	1361-1380	1800.0		
1322	477.4	0.5	0%	1388-1389	2500.0	17.9	1%
1327†*	1254.5	786.7	63%	1418*	674.6	513.1	76%
1329‡	1150.0	41.6	4%	1419-1420*	1151.9	1053.3	91%
1330-1331	820.3			1460-1480	1800.0		
1349‡*	1954.4	1380.0	71%				

Table 3: Total Revenues and Seigniorage, France (1286-1480). Sums are in current livres tournois unless specified otherwise. *: Debasement during that year or the year before. †: first half of the year at annual rate. ‡: second half at annual rate. ^a: in 1330 currency. ^b: in 1361 currency.

Sources: the seigniorage revenues for 1354-60 are computed from the minting data in Saulcy, *Recueil*, vol. 1; the other data are in Vuitry, *Études*, vol. 2, p. 674; Fawtier, *Comptes*; Lot and Fawtier, *Histoire des institutions*, vol. 2, pp. 191, 231-32, 270; Rey, *Domaine du Roi*, pp. 35, 80-90, 96-99, 164, 404; Pocquet de Haut-Jussé, *Compte*.

and in comparison with other sources of revenues for the government. In the first sense, since output increases sharply during debasements and seigniorage rates do not fall and often increase considerably, revenues are indeed large.

The second sense requires a comparison with total government revenues. Unfortunately, the data is very fragmentary. Tables 3 and 4 present what we know.

For France, the available data is presented in Table 3. It appears that seigniorage was a negligible source of revenues during normal years, usually 5% or less. But in debasement years, it could represent 50% of revenues or more, as in the years 1299, 1327 and 1349. We also have some estimate of seigniorage revenues during the two major debasement periods in France: the 1350s and the 1410s, but they require some comments. Concerning the 1410s, the amounts given in Table 3 correspond to revenues in the areas of France under the control of the king and his adviser the duke of Burgundy. As the latter had just abolished a host of taxes that previously provided most of the revenues, it is not surprising that the share of seigniorage in total revenues is extremely high, between 75 and 90%. Concerning the period of the 1350s, the seigniorage collected needs to be compared with some contemporaneous total revenue figure, which we don't have. If we compare to

revenues in the 1330s or in the 1370s, the ratio of seigniorage to total revenues is 8 to 12%. In all likelihood, the ratio was in fact much higher, since the country was again at war and regular tax collection probably at a low. In any case, 8 to 12% is still a larger share of revenues than in non-debasement periods.

Period	Annual Revenues (£'000)			Period	Annual Revenues (£'000)		
	Total	Mint	Ratio		Total	Mint	Ratio
1323–1342		0.1		1470–1483	27	0.5	2%
1343–1344*		1.7		1505–1509	142	0.1	0%
1378–1399	114			1530	100	0.0	0%
1400–1410	73			1535–1539	212		
1452–1463	31			1540–1543	429		
1463–1466*	(30)	5.2	17%	1544–1547*	570	150	26%

Table 4: Total Revenues and Net Seigniorage, England (1323–1547). Sums are in current pounds sterling.
*: Debasement period.

Sources: Revenues from Steel, *Receipt*, Appendix C), Williams, *Tudor Regime*, p. 58; Dietz, *English Government Finances*, pp. 86, 138–40, 159 for 1505–1547. The sales of monasteries account for £60,000 in 1535–1539, £144,000 in 1540–1544, £135,000 in 1545–1547. Taxes, parliamentary or otherwise, amounted to £0.92m in 1540–1547, or £115,000 annually. Mint revenues were £1.2m 1544–51 or £150,000 annually. Mint Revenues from Mayhew, *From Regional to Central Minting*, Tables 4, 5; and Challis, *Lord Hastings*, Tables 12 and 18.

The return on minting activity in England has a striking resemblance to that of France. As in France, seigniorage revenues that were negligible in non-debasement years were substantial in debasement periods. The Great Debasement, in particular, resembles the French-style debasements both in the magnitude of the debasement and in the amount of revenue it created. In non-debasement years the seigniorage rate was very low, as shown in Figure 5. A low rate of seigniorage bearing on a small volume of minting could not have produced large profits. Table 4 confirms this; seigniorage was never more than 2% of revenues in non-debasement periods. In contrast, total profits for the debasement years of 1544 to 1551 have been estimated at £1.2m. During the same period, revenue raised from all other taxes (ordinary revenues as well as taxes granted by Parliament and forced loans) was roughly £1m while the rent and sales of Crown land amounted to just over £1m.¹⁵ Consequently, while minting revenues contributed little to the English

¹⁵ See Challis, *Debasement*.

sovereign's purse during normal years, it represented roughly 1/4 of his revenues during the Great Debasement period. Further, during the debasement period from 1463 to 1466, seigniorage revenues were roughly 1/6 of total revenues.

The Modeling Challenge

If the model we use to think of money in medieval times is a model of commodity money, then the facts we have documented in the previous section are very puzzling. Since debasements are simply an opportunity to change heavy coins into light coins, and at a cost, they provide no additional incentive to bring metal to the mint. Why, then, did debasements lead people to voluntarily increase the amount of metal that they brought to the mint?

One existing explanation, which we call the "money rents explanation," is that debasements allow debtors to reduce the real value of their debts legally, even if coins were valued by weight for most other transactions. This explanation was proposed by Miskimin.¹⁶

"... a number of payments, feudal contracts, rents, etc. were fixed in terms of the money of account and could be paid in either debased or sound coin. Debasements might have caused people to bring sound money to the mints in order to receive bad money for the payment of such obligations."

As long as the mint price for new coins is higher than the mint equivalent for old coins, a holder of old coins receives more units of accounts by converting old coins into new coins. When contracts are denominated in units of account and when creditors have to accept any coin at its face value in payment, debasements offer debtors the means to reduce the real value of any such debt. This opportunity exists no matter how the coins are traded in other transactions.

There is an immediate logical difficulty with this explanation. Although it suggests an incentive for bringing coins to the mint, it does not rule out stronger incentives not to

¹⁶ See Miskimin, *Money, Prices*, p. 44. It first appears in Landry, *Essai économique*, p. 124, n. 1. Glassman and Redish, *Currency Depreciation*, explain currency depreciation in early modern Europe as the result of the imperfections of bimetallism and wear and tear on the coinage itself. Their explanation does not address the kinds of debasements that we observe in France and during the English Great Debasement.

bring coins to the mint. In fact, following a debasement debtors and creditors could get together and “renegotiate” the debt contract. Once a debasement has occurred, nominal creditors face the prospect of real losses if debtors pay their obligations in the new, lighter coins. But the debtors, to obtain the new, light coins, have to pay a large seigniorage tax to the sovereign. Thus, the creditor can reduce his loss, and the debtor increase his gain, by by-passing the mint altogether and renegotiating between themselves the real amount of the debt.¹⁷

Rejection of the money rents explanation leaves us with the modeling challenge of solving the debasement puzzle. We think that a model that solves it will make an important contribution to monetary theory. However, as we see it, such a model will not only have to explain why minting volumes are large following debasements, but will also have to be consistent with at least three other stylized facts about that period.

- 1) Following debasements, both old (heavy) and new (light) coins circulated side-by-side;
- 2) For gold coins and, in some cases, for silver coins as well, coins were valued in circulation by their intrinsic content (circulation by weight) rather than by their legal tender value (circulation by tale).
- 3) Following reinforcements, minting volumes were also unusually large, approximately the same as following debasements.

Concurrent Circulation of Different Coins

There are two ways to establish concurrent circulation of different coins after debasements. One is with direct testimony from contemporary sources.

Monetary laws, for example, provide evidence of simultaneous circulation. After mutations, several coins were given new legal tender values, which implies that they were

¹⁷ There is some indirect evidence that such renegotiations could occur. In July 1421, a reinforcement occurred in the English-controlled parts of France, including Paris. Landlords prepared to take advantage of a four-fold increase in the real value of leases, and tenants prepared to riot. Paris officials then announced that the coming term would be payable in old (weak) currency, and gave tenants the right to renegotiate, with an option to cancel their leases if they were not satisfied. This measure amounted to a redistribution of bargaining power within an on-going negotiation (*Journal* 1990, §314).

circulating. For example, in France, the debasement of 1303 was followed by a reinforcement in 1305 and 1306, then by another debasement in 1311. During the final reinforcement of 1313, an edict was passed, setting the legal tender value of several billion coins: the old *doubles* of 1303, the *gros* and *obole tierce* of 1306, the *deniers* of 1307 and the *bourgeois* of 1311. Thus coins from two cycles of debasement and reinforcement were presumed to be in the public's hands. Similarly, during the short-lived reinforcement of March 1356, legal tender values were set for the newly minted *gros*, the old *blancs à la queue* of July 1355, the most recently debased *blancs à la queue* of November 1355, and even for the old "full-weight" *gros* minted from 1329 to 1337. The ordinance of Feb 2, 1353, which decried all but the most recent gold and silver coins, complained that "the people give currency to all sorts of coins, and for the price that it pleases."¹⁸

The other type of evidence is indirect: although minting volumes following debasements were large relative to volumes in "normal times", they were not large relative to the total stock of coins prior to debasement. In other words, all old coins could not have been taken in for recoinage. Either they were hoarded (in which case transactions must have been carried out with greatly reduced real balances, which does not seem plausible) or they remained in circulation.

In neither England nor France are minting volumes during debasement periods large relative to the initial stock of coins. This conclusion is based on a rough comparison of the total minting of silver or gold during debasement periods with the total supply of silver or gold coins immediately before such periods.

While there is very little hard evidence on the supply of silver and gold coins in England or France from 1300 to 1600 on which to base this comparison, there is enough information to estimate a *range* in which per capita money holdings were likely to be. Our approach is therefore to construct such a range of per capita money holdings in the late medieval period in France and England, and then compare those numbers with the amount of minting (in per capita real terms) that followed debasements.

First, we obtain an estimate of the per capita holdings of coined metal in terms of grams of silver. In Table 5 we present some existing estimates of the money supply for

¹⁸ Saulcy, *Recueil*, vol. 1, pp. 186, 309, 357.

Year	Money Supply (£m)	Pop. (m)	Money per cap. (g)	Year	Money Supply (£m)	Pop. (m)	Money per cap. (g)
<i>England</i>				<i>France</i>			
1311	1.1	3.7	95	1493	30.5	8	78
1324	1.0	3.7	87	1580	90.0	16	66
1348	0.4	3.7	33	1650	{ 167	20	69
1345–1350 {	0.50	3.7	40		201	20	84
	0.6	3.7	47				
1353	0.5	2.2	60				
1470	0.9	2.3	73				
1526	1.4	2.9	90				
1561	1.4	3.0	60				

Table 5: Estimates of per capita Money Holdings, France and England.

Sources: England money stocks from Mayhew, *Numismatic Evidence* and population from Russell, *British Medieval Population*. France money stocks from Glassman and Redish, *New Estimates* and Riley and McCusker, *Money Supply*, population from Dupâquier, *Histoire*.

this period that do not rely on medieval minting data and use them to estimate mean per capita quantities of silver. Remarkably, these estimates of real per capita money holdings do not vary much over three centuries or between the two countries. They range from 33 g to 95 g of pure silver per capita, with the median around 70 g.¹⁹

To compare minting volumes with estimates of money stock, when we do not know the shares of the two metals in the money supply, we convert kilograms of minted gold into “silver equivalents” using the mint ratio between gold and silver. The total minting during debasement periods is the sum of minted silver and minted gold computed in silver equivalents. We finally obtain per capita quantities of metal passing through the mint in debasement episodes.²⁰

The figures for minting per capita during debasements in France appear in Table 6. The comparison with money holdings seems to imply concurrent circulation, because mint-

¹⁹ Assuming five people per household, 95 g of silver per head would have amounted to approximately 4 to 6 months’ wages for a carpenter. See Phelps-Brown and Hopkins, *Seven Centuries*, and Baulant, *Salairé* for wages, and the Appendix to convert metal into units of account. See Riley and McCusker, *Money Supply*, for similar numbers in the 17th and 18th centuries in France.

²⁰ Here, we define a debasement period as the year in which the debasement occurred plus the next three years or else until a reinforcement occurred, whichever was shorter. We want to allow for the possibility that the stock of money would take more than a year to flow through the mints.

Period	Pop. (m)	Silver Minting: '000 kg g/cap		Period	Gold Minting: kg g/cap	Mint Ratio	Total Minting, in silver g/cap
1354-60	8.25	73.16	8.9	1354-55	1685 0.20	10.0	10.9
	8.25			1358-60	4246 0.51	10.0	5.1
1365-66	8.25	3.61	0.4			10.0	0.4
1389-90	8.25	6.91	0.8			9.6	0.8
1411-12	9.25	3.40	0.4			8.6	0.4
1414-15	9.25	3.64	0.4			8.6	0.4
1417-24	9.25	61.10	6.6	1417-21	3203 0.35	10.9	10.4
1426-29	10.25	16.29	1.6	1423-29	1204 0.12	9.6	2.8
1431	10.25	0.44	0.0	1431	50 0.00	10.1	0.0
1434-36	10.25	2.40	0.2	1436-36	139 0.01	10.5	0.3
1447	11.25	0.35	0.0	1447	74 0.01	10.7	0.1
1473-74	11.25	0.62	0.1	1475-76	2 0.00	10.3	0.1
1488	12.00	0.39	0.0	1488-89	14 0.00	11.0	0.0

Table 6: Total Minting Activity in Debasement Periods, France. The mint ratio is that which prevails in the periods after the debasements ended. Sources: Minting volumes from Saulcy, *Recueil*, population from Dupâquier, *Histoire*, minting ratios from the Appendix.

ing volumes are very small relative to total money stocks. In most debasements, the minting of either silver or gold coin amounted to less than one gram per capita. In fact, the largest minting of either silver or gold coin during any debasement period was only 10 or 11 g of pure silver per capita during the debasement periods of 1354 to 1360 and 1417 to 1424. This is only about a third of the lower end of our range of per capita holdings of pure silver during this period.

For England, the evidence shows minting to be a larger fraction of the money stock, although taken as a whole, it still indicates that there were old coins in existence that were not reminted and which could, therefore, have remained in circulation. The evidence is presented in Table 7.

For the debasement periods of 1344 to 1347 and 1346 to 1349, minting is a very small fraction of the money stock. For the period from 1527 to 1530, minting is substantially higher, but still only amounts to roughly half of the money stock using the low end of our range of money stock estimates. This leaves four debasement periods (from 1351 to 1354, from 1412 to 1415, from 1464 to 1466 and the Great Debasement from 1542 to 1551)

Period	Pop. (m)	Silver Minting:		Gold Minting:		Mint Ratio	Total Minting, silver g/cap
		'000 kg	g/cap	'000 kg	g/cap		
1344–1347	3.70	23.4	6.3				6.3
1346–1349	3.70			2.8	0.74	11.16	8.3
1351–1354	2.20	75.7	20.5	7.8	2.11	11.57	44.9
1412–1415	2.50	4.3	2.1	6.7	3.18	10.39	35.1
1464–1466	3.25	19.7	8.6	4.2	1.83	12.16	30.9
1527–1530	3.88	39.3	12.3	2.3	0.73	11.51	20.7
1542–1549	3.96	111.9	33.9	14.0	4.25	8.14	68.5

Table 7: Total Minting Activity in Debasement Periods, England. Sources: Russell, *British Medieval Population*, Challis, *Appendix 2*.

when minting numbers come close to money holdings. But closer examination casts some doubts. In 1464, the figure of per capita minting is about 31 g, at the very low end of our estimates, and less than half the estimate for the money stock in 1470 (see Table 5). For the 1412 debasement, minting per capita is 35 g, again in the very low end; moreover, the quantity of silver brought in is only 12% by value of the total. It is hard to imagine that this represents the whole stock of silver. Finally, the Great Debasement in fact covers 10 debasements over a period of eight years. Since total minting for that period was only one or two times the estimated money stock, it is hard to believe that coins of different debasement vintages were not simultaneously in circulation during the period. That leaves only the 1351 debasement period as the only possible exception to our stylized fact.

Circulation by Tale or by Weight

With regard to the relative values at which old and new coins circulated, there is apparently no contention that gold coins circulated in any other way than at their intrinsic value. For silver, the mixture of evidence leads us to conclude that there were cases in which silver coins circulated by weight and cases where they circulated by tale, with perhaps both occurring at the same time. Miskimin states that in the Middle Ages “coins are weighed and circulate as bullion; the market rate for bullion then dominates over all official rates.”²¹

²¹ Miskimin, *Money, the Law*.

But other authors have flatly stated that silver circulated by tale. Some do it as a working assumption, and condition their whole work on it, as does John Gould in his explanation of the Great Debasement.²² Others, such as John Munro, simply asserts that “silver coins in particular normally circulated by “tale,” at decreed face values, and not by weight.”²³ We have been unable to find authors who provide evidence for this practice.

Instead, we have found numerous indications to the contrary, showing that even silver coins did not circulate by tale in late-medieval Europe. The evidence sheds light on actual practices by individuals of the time.

Some anecdotal evidence comes from a diary kept by an anonymous Parisian cleric between 1405 and 1449.²⁴ For example, in 1419 and 1420, the Parisian’s diary gives prices for new silver coins in terms of old billon coins. In June 1419, he complains, on the occasion of a new issue of coins, that “purchases always required discussions” (*par achat courait toujours marchandise*). (*Journal* 1990, §§ 254, 261, 284).

Other indications that silver coins circulated by weight can be found in contemporary account books. One finds silver receipts in different coins converted to gold coin values, or to a fixed ‘strong’ silver coin value. Georges d’Avenel claims that during the debasements of Philip IV (1295-1313) most real estate sales contracts were specified in strong money.²⁵ Léon Borrelli de Serres provides other examples, among which an account-book of 1305 attesting to the joint circulation of *gros* worth 21d., 34d. and 36d. in 1305, before the reinforcement.²⁶ After the 1329 reinforcement, accountants at the Saint-Denis abbey broke down their receipts into weak, medium and strong currency.²⁷ A city treasurer in Tours in 1359 counts “24s. which are worth 132s. 9d.” The Saint-Jacques Hospital in Paris in 1360 separates receipts in strong, medium and weak money. D’Avenel adds that in such separate accounts, receipts in strong money dominate. There is evidence that even royal accountants made the distinction in their own receipts: in September 1421, the wages of a

²² Gould, *Great Debasement*, p. 16. He justifies his assumption by saying that “the law was on the side of fiat value” and by appealing to a convenience argument.

²³ Munro, *Bullion Flows*.

²⁴ See *Journal*. The writer is commonly known as the “bourgeois of Paris,” but his name has not survived. Evidence internal to the manuscript shows him to be a cleric, probably a doctor of the Sorbonne and a canon of Notre Dame.

²⁵ D’Avenel, *Histoire économique*, vol. 1, pp. 53–55.

²⁶ Borrelli de Serres, *Recherches*, vol. 2, pp. 529–30.

²⁷ Miskimin, *Money, Prices*, p. 61.

royal officer were given as 6 sous parisis (7.5st.) per day in weak money (*foible monnoie*), converted, for the accounts, into 1.5 sous parisis in strong money, the exchange rate being 4dp. in strong money per weak *gros* of 20dp. (*forte monnoie, 4d. pour gros*).²⁸ There are also examples of accounts where all silver coins are converted into gold coins for book-keeping purposes. In his study of trade in medieval Toulouse, Philippe Wolff has found plenty of evidence of concurrent circulation of silver coins with different market values.²⁹ Accountants and merchants would count in livres of this or that coin, and convert to gold coins to keep track of the different values of the silver coins (the accounts of the abbey of Saint-Denis near Paris in 1358 and 1359 show the same practice as do the accounts of the Bonis brothers in Montauban in the 1340s and 1350s.³⁰ In 1432, archives in Toulouse reveal the simultaneous circulation of four different gold coins.

These numerous examples show clearly that debased coins did in many cases circulate jointly with older coins, and that they traded, or were counted by individuals in their accounts, according to their intrinsic content.

Minting Volumes following Reinforcements

In a previous section we established the stylized fact that minting volumes were unusually large following debasements. We now establish a similar fact for reinforcements. In fact, minting volumes after reinforcements were as large, if not larger, than after debasements.

Since there was only one reinforcement in England during the period under consideration (in 1551) and there is no minting data for the years immediately following, we rely exclusively on French data, presented in Table 8. This table is identical to Table 1, except that we now separate into debasement minting, normal minting and reinforcement minting. Normal periods are those during which no mutation occurred.

For silver, the increase in volumes following mutations is clear. In fact, the stylized fact about debasement is strengthened, when the distinction is made between normal and reinforcement periods. Of the ten most active mints, only Tournai stands apart: the

²⁸ Douët-Darcq, *Comptes*, p. 273; see also Fawtier, *Comptes*, p. 38.

²⁹ Wolff, *Commerce et Marchands*, p. 311, pp. 337–39.

³⁰ See Fourquin, *Campagnes*, p. 285 for Saint-Denis and Forestié, *Livres de comptes*, for Montauban.

Mint	Share of Output	Debasement		Normal		Reinforcement		Deb. Norm Ratio	Reb. Norm Ratio
		Number Months	Mean Output	Number Months	Mean Output	Number Months	Mean Output		
Silver									
Toulouse	11.2%	146	132.6	302	26.5	72	238.5	5.0	9.0
Romans	9.8%	93	108.7	743	26.8	47	51.5	4.1	1.9
Troyes	9.7%	89	115.4	309	20.7	50	436.3	5.6	21.1
Poitiers	7.7%	69	232.6	44	32.6	30	436.5	7.1	13.4
Rouen	6.4%	45	373.7	10	6.7	29	310.6	55.6	46.2
Crémieu	5.5%	90	83.8	406	38.5	46	26.6	2.2	0.7
St.Pourçain	5.4%	70	190.5	41	58.7	42	142.1	3.2	2.4
Tournai	5.3%	0	n.a.	70	328.9	17	9.2	n.a.	0.0
Montpellier	4.8%	73	89.6	475	19.2	22	155.9	4.7	8.1
Dijon	4.5%	34	316.6	229	17.2	18	171.3	18.4	10.0
Gold									
Paris	18.9%	32	84.7	412	28.7	0	n.a.	3.0	n.a.
Tournai	15.4%	0	n.a.	104	55.0	4	75.3	n.a.	1.4
Montpellier	14.9%	34	16.4	507	25.8	15	77.2	0.6	3.0
Toulouse	14.3%	49	20.6	454	19.4	21	18.2	1.1	0.9
Troyes	4.8%	16	7.4	182	8.6	3	76.9	0.9	9.0

Table 8: Minting Volumes in Debasement, Normal and Reinforcement Months Selected Mints, France (1354–1490). The share of each mint in the total minting output for that period is indicated. Source: as in Figure 1.

minting data comes from a period during which this mint operated independently of the rest of France and did not engage in much debasing or reinforcing. All others, except Crémieu, show twice as much minting in debasement and in reinforcement periods as in normal periods. The average of these ratios, weighted by output shares, is 10.7 for debasement and 8.1 for reinforcement. For gold, the result is once again less strong, although still noticeable. Output-weighted ratios are 1.6 and 2.5 for debasement and reinforcement.

Conclusion

This paper establishes the stylized fact that debasements were accompanied by large minting volumes and unusually large revenues for the sovereign. However, this fact is difficult to explain if one takes the commonly held view that gold and silver coins are commodity monies that exchange by weight. One explanation of this puzzle is that debased coins were used to reduce the real burden of debts denominated in nominal terms. But this explanation has a logical flaw: following debasements, debtors and creditors could renegotiate nominal debt payments to avoid the seigniorage tax, and reminting would not have to occur. We also establish that, following debasements, old and new coins circulated side by side and exchanged at prices which reflected their intrinsic contents. Moreover, reinforcements generated the same kind of minting volumes as debasements did.

In our opinion, the stylized facts we have presented suggest that models of commodity money, which currently assume well-informed agents, may be inadequate. In fact, there is currently no model of commodity money which is capable of successfully confronting the facts we present.³¹

A potentially fruitful line of research may be to weaken the full information assumption. This must be done with care, however. One cannot assume that all agents are uninformed about debasements; otherwise no unusual volumes would be observed at the mints, since no one would know that the debasement occurred. (Debasements were usually accompanied by a change in mint price, which was no doubt used as a signal that a debasement had just taken place.) We must also take into account the fact that debasements became known within a matter of weeks. Therefore, the lack of information must be either very transient, or due to underlying, structural reasons. One solution might be to distinguish between knowledge that a debasement occurred, which we believe was common, and the ability to use that information in everyday transactions. The existence of a few agents deprived of that ability may be enough to create profit opportunities from

³¹ Sargent and Smith, *Coinage, Debasements*, study a model of commodity money with full information and a cash-in-advance constraint, and propose to shed light, among other things, on medieval debasements. The cash-in-advance constraint requires that, if coins do circulate, they circulate by tale. Thus circulation by tale is assumed, not explained. Empirically, we find this assumption unwarranted. Theoretically, the model only explores the internal consistency of the concept of debasement in an economy where debased coins will circulate, if they do, at par with the original coins. It does not provide a complete, structural explanation of debasements.

converting old coins into new coins.

Whatever the nature of the model that will solve the debasement puzzle, we believe that it will deepen our understanding of commodity money, and of money itself.

Appendix

We present data pertaining to mint prices and equivalents in France and England. The data for France is not readily available anywhere.

France

The data is drawn from two main sources: Saulcy (1879, 1 and 2) and Lafaurie (1951). Saulcy publishes manuscript lists of mint prices and characteristics of gold and silver coins, from the late 13th to the late 15th century. The list we relied upon principally is on pp. 35–68. A few gaps or corrupted passages were completed with the other lists, pp. 14–6 and 22–6. The information in the lists was compared to and corrected with information from the other volumes of Saulcy as well as Lafaurie (1951). For 1285–1330, we have also used Borrelli de Serres (1902).

From 1418 to 1420, four separate authorities minted coins in France: the duke of Burgundy had been given the right to operate several mints in Eastern France, the king of England had set up his own mints in newly-conquered Normandy, the French king Charles VI minted in Paris and other places in Northern France, and the Dauphin, future Charles VII and self-proclaimed Regent in May 1418, operated in Southern France. Burgundy's French mints ceased to function in 1420. After the Treaty of Troyes and the death of Charles VI in 1422, the English king was recognized in the North of France and the same coins were issued in all territories under English control. At the same time, the Dauphin was recognized as Charles VII in the rest of France, and two minting authorities operated from then on. Paris was taken by Charles VII in 1436, and after the expulsion of the English in 1453 the kingdom was reunited. In the table that follows, we have indicated the mint equivalents for Paris under Charles VI and later Henry VI (1418–36), followed by the mint equivalents for the areas under the Dauphin, later Charles VII.

Silver prices are given in sous tournois for a Troyes marc of silver *Argent-le-Roi*, that is, 244.753g of silver 23/24 pure. For the period 1329 to 1436, this is 5 times the *pied de monnaie* (the measure used in official documents of the time). Sometimes the mint equivalent for billon coins was different; also, the mint price for bullion with low fineness (i.e., bullion of same fineness as billon) was different. The date is that on which the mint price became effective in Paris. The records in Saulcy show that provincial mints usually followed within a week or two. The begin and end-dates of the records of minting from the various mints usually match these dates pretty well, so that it is possible to identify how much was produced at which prevailing prices.

From November 23, 1356 to late 1360 the Languedoc was on a different regime, with the ME and MP at 148 and 160 for silver, 140 and 160 for billon.

The gold mint equivalents and mint prices are in livres tournois (lt) for a marc of pure gold.

			Silver:		Billon:				Silver:		Billon:
			ME	MP	ME				ME	MP	ME
1	Jan	1266	58	54	58	25	Dec	1329	90		90
10	Feb	1288		58		11	Apr	1330	60	57.50	60
1	Jan	1290	63.43	58	59.20	12	Jun	1333		55.50	63.85
6	Apr	1293	63.43	61		9	Mar	1334		<i>no minting</i>	
3	Apr	1295		61	67.50	13	Feb	1337	90	72.50	90
20	May	1296	72.50	66		3	Nov		90	72.50	
18	Dec		72.50	68		1	Feb	1338	90	76	
4	Jul	1297	72.50	70		18	Feb	1338	90	80	
25	May	1298	108.75	75		28	Oct		90	84	
7	Jun	1299	108.75	78		16	Nov		+120	92	
11	Oct		108.75	85		18	Dec		120	96	
23	Apr	1302	108.75	88		3	Jan	1339	120	100	120
23	Aug	1302	108.75	95		19	Aug		120	105	120
2	Feb	1303	108.75	104		17	Dec		120	110	120
23	Aug		+169.17	120	173.57	5	Feb	1340	+150	125	+150
7	May	1304	169.17	125	173.57	14	Apr		180	135	+180
24	Jun		169.17	132	173.57	1	Aug		180	140	180
8	Sep		169.17	135	173.57	4	Dec		180	150	180
18	Oct		169.17	145	173.57	5	Feb	1341	210	164	210
1	Mar	1305	169.17	150	173.57	17	Feb		240	192	240
18	Apr		190.30	170		17	Aug		240	200	240
12	Oct		63.44	55.50	58.05	13	Dec		240	210	240
16	Jun	1306	63.44	54	58.05	10	Mar	1342	240	220	240
24	Jan	1307	63.44	53.50	58.05	30	Jun		300	250	300
14	Sep	1308	63.44	59		7	Sep		300	260	300
1	Nov	1309		59		9	Apr	1343	300	270	300
11	Nov	1310†	?	70	?	22	Sep		225	212	275
20	Jan	1311		75	78.75	1	Nov		75	64	75
8	Jul			75	78.75	16	Feb	1345	75	68	75
9	Aug			73	78.75	9	Apr		75	70.50	75
19	Sep	1313		54.58	78.93	17	Jul	1346		90	+120
1	Mar	1318	74	67.50	78.93	27	Jan	1347		100	120
7	May	1322	74	67.50		4	Mar			135	180
27	Oct			68.75	72.50	23	Jul			150	180
2	Mar	1323	88.50	80	88.50	11	Jan	1348		96	110
22	Jan	1326	88.50	85		30	Aug			100	+120
24	Jul		120	90	120	8	Dec			105	120
20	Jan	1327	120	100	120	22	Feb	1349	180	125	180
8	Jan	1328	120	108	120	12	May		180	135	180
7	Nov		120	111	120						

Table 9: Mint Equivalent and Mint Price of Silver, France (1266–1500). Prices are in sous tournois per Troyes marc (=244.753g) of King's silver (23/24 pure). See text for explanations and sources.

†: no official change in ME but the mint price suggests that a debasement had already occurred. No minting, Oct 10, 1329 to Sep 10, 1330.

		Silver:				Billon:						Silver:				Billon:			
		ME		MP		ME		MP				ME		MP		ME		MP	
8 Aug	1349	180		155	180	147				24 Nov	1354	120	84	120	80				
23 Jan	1350	180		155	180	150				23 Jan	1355	120	96	120	92				
23 Apr				100	120					27 Jan		+160	96	+160	92				
11 Aug				105	120					4 Apr		200	106	200	104				
22 Aug				105	+180					20 May		200	130		124				
24 Nov				112	180					24 May		+240	130		124				
5 Feb	1351			120	180					6 Jul		240	150		144				
6 Mar				128	180					18 Jul		320	200	320	188				
24 Mar				128	225					25 Aug		+360	220	360	208				
18 May		240		128	240					28 Sep		400	250		238				
23 Jun		240		148	240					19 Oct		400	280		268				
18 Aug		240		175	240	165				31 Oct		500	280		268				
12 Sep		240		200	240	190				10 Nov		500	320		308				
28 Sep		+270		200	+270	190				17 Nov		+600	320		308				
17 Oct		270		210	270	190				15 Dec		600	360		348				
16 Dec		270		220	270	200				5 Jan	1356	120	105	120	95				
15 Jan	1352	270		240	270	220				9 Aug		240	130		126				
4 Feb		150		92	150	85				19 Sep		300	145						
27 Mar		150		106	150	96				29 Oct		300	170						
2 Jun		150		114	150	104				9 Dec		240	200	240					
24 Jul		150		122	150	112				10 Jan	1357	240	210						
31 Jul		200		122	200	112				20 Feb		240	230						
16 Aug		200		130	200	120				4 Mar			260						
24 Oct		200		138	200	128				26 Mar		140	130	140	124				
25 Nov		200		140	200	150				23 Jan	1358	225	170	225					
10 Dec		240		140	240	150				1 May		270	200	270	190				
31 Dec		240		180	240	170				1 Jul		320	240		230				
6 Feb	1353	240		200	240	184				24 Jul		400	280		270				
22 Apr		320		240	320	220				30 Aug		160	135	160	130				
2 Aug		320		255	320	235				21 Oct		225	140	225	138				
25 Oct				95	130	90				22 Nov		+300	160		158				
27 Nov		162.5		95	+162	90				27 Nov		300	172						
8 Dec		162.5		95	162	90				6 Dec		300	190						
10 Feb	1354	162.5		107	162	100				25 Feb	1359 ^a	180	140	180					
27 Mar		162.5		117	162	110				27 Feb		200	140	200					
16 Apr		162.5		135	162	125				16 Apr		240	150	240					
26 Apr		240		135	240	125				24 Apr		300	180						
24 May		240		182	240	170				3 May		+360	230						
5 Jul		320		212	320	200				1 Jun		300	180						
17 Sep		320		240	320	228													

Table 9 (continued) ^a: Paris only.

						Silver:				Billon:			
						ME	MP	ME	MP	ME	MP	ME	MP
12 Jun	1359	+	350	180									
9 Jul			350	240									
12 Jul		+	400	240*									
31 Jul			480	324*									
8 Sep			600	443*									
5 Oct			750	443*									
19 Oct			750	588*									
22 Oct			900	588*									
24 Nov			360	300*									
4 Dec		+	450	300*									
15 Dec			450	368.75*									
31 Dec			720	492*	600								
21 Jan	1360		1080	689.50*									
10 Feb			1200	840*	960								
25 Feb			1500	1057.50*									
3 Mar		+	2000	1456*									
18 Mar			2500	2040*									
21 Mar			240	220	240								
23 Apr		+	320	220									
29 May		+	384	220									
2 Jun			240	140									
17 Jun			240	140	240								
22 Jun			400 ^a	210									
8 Aug			500	280									
12 Aug			600	350									
22 Aug			600	370									
10 Sep			165	140									
22 Oct			264	140									
3 Nov			264	160									
19 Nov			264	180									
17 Dec			120	98	120								
23 Apr	1361		105	100	105	85							
24 Jul	1364		105	100	105	85							
2 May	1365		120	105	120	100							
3 Aug	1369		123	105	120	100							
12 Oct	1373		123	105	120	100							
11 Mar	1385		125	116	125	112							
13 Oct			125	116	125	116							
30 Oct	1389		135	120	135	114							
31 Oct	1390		135	120	135	117							
8 Apr	1391		135	125	135								
26 Oct			135	125	135	122							
25 Mar	1392		135	125	135	122							
26 Oct	1411		160	135	160	128							
30 Nov	1412		160	140		133							
7 Jun	1413		145	140		140							
3 Nov			145	140		140							
4 Jun	1414		160	146									
10 May	1417		200	160	200								
21 Oct			300	180	300								
28 May	1418		300	190									
<i>Charles VI, Henry VI until 1436</i>													
19 Jan	1419		300	200									
7 Mar	^{b, c}	+	480	330									
14 May	^b		420	330									
18 Jun	^c		400	300									
2 Jul			480	330									
17 Jan	1420 ^b		420	330	420								
9 Apr			640	360									
6 May			800	520									
13 Oct	^b		720	520									
19 Dec	^b		150	140									
11 Feb	1421			560									
11 Aug			150	123	150								
23 Nov	1422		150	135	150								
4 Jun	1423		150	138	150	116							
9 Aug	1426		150	148	150	140							
<i>Dauphin, Charles VII</i>													
4 May	1418		300	180									
25 Dec			300	195									
20 Mar	1419		320	180									
11 Apr			340	230									
9 May			+360	240									
30 May			+400	260									
10 Jun			420	280									
14 Jun			500	300									
19 Sep			540	300									
4 Nov			600	330									
3 Feb	1420		600	360									
23 Mar			600	400									

Table 9 (continued) *: The mint price was stated in gold coins (the *royal* containing 3.547g of 24c gold). Prices were as follows: Jul 12–31: 5R, Jul 31–Sep 9: 6.75R, Sep 9–Nov 24: 7R, Nov 24–Mar 23: 6R. The equivalence in units of account come from the sources, and appear to reflect a market value of the gold coin. ^a: in Paris, Rouen, Troyes, Bourges, Limoges and Tours only. *ME* = 300 elsewhere. ^b: Paris only. ^c: Tournai only.

	ME	MP		ME	MP
1 Jan 1266	29.167		19 Jan 1342	143.75	136
1 Aug 1290	43.125		28 Jun	178.5	168
10 Jan 1296	47.045		16 Sep	178.5	171
22 Aug 1303	107.813		10 Apr 1343	‡	
3 May 1305	48.125		22 Sep	*121.5	107
30 Jun 1306	48.125	44	1 Nov	* 45	43.333
13 Apr 1308	43.125		27 Mar 1344	45	44.167
13 Aug 1310	56.455	49.5	17 Jul 1346	52	50
8 Feb 1311	59.167	57.5	4 Mar 1347 *	78	72
12 Jan 1313 *	44.375		6 Apr	78	75
25 Aug 1314 *	59.167		27 Sep	78	75
6 May 1315	59.167	53	21 Jan 1348 *	52.826	51.5
28 Feb 1316 *	44.375		28 Aug	+ 53.407	51.5
11 Apr	* 36.979		26 Mar 1349+	55.227	51.763
8 Dec	* 59.167		28 May	+ 57.857	52.075
15 Nov 1317	59.167	58	3 Dec	57.857	53
15 Oct 1322	59.167	57	4 Sep 1350	57.857	53.938
16 Feb 1326	72.5	67.5	4 Jun 1351	57.857	54.875
28 Jan 1328	90.625	84.375	20 Jun	+ 59.268	54.925
21 Mar 1329 *	81.2	75.6	23 Jul	+ 60.75	54.925
25 Dec	* 52.2		9 Aug	100	96
11 Apr 1330 *	34.8		23 Aug	60.75	56.25
20 Sep	42	40.5	24 Sep	67.5	58.125
9 Jan 1332	49.5	40.5	17 Nov	67.5	60
9 Mar 1334	49.5	†	3 Feb 1352 *	54	48
1 Feb 1337	54	50	20 Apr	54	48.75
1 Feb 1338	54	52	8 May	* 72	65
13 Nov	62.5	58	19 Dec	*108	97.5
12 Dec	62.5	59.5	12 Jan 1353	108	99
25 May 1339	62.5	61.5	3 Feb	*135	123.75
14 Jun	72	66	24 Oct	* 54	50.25
9 Aug	72	69	21 Nov 1354 *	45	41.875
20 Jan 1340	72	71	24 Nov	65	60
7 Feb	90	82	1 Jun 1355	65	61.25
14 Apr	108	95	16 Jun	65	62.5
7 May	+112.696	100	29 Jan 1357	65	63.125
27 Jul	112.696	104	21 Jun 1358 *	78	75.75
7 Oct	112.696	108	31 Aug	82.5	78.75
7 Feb 1341	126.25	115	20 Apr 1359	86.25	80.625
24 Aug	143.75	130	2 Jun	*103.5	97.5

Table 10: Mint Equivalent and Mint Price of Gold, France (1266–1500). Prices are in livres tournois per Troyes marc (=244.753g) of pure gold. See text for explanations and sources.

Notes: †: no minting. ‡: no *LTV* set; the mint equivalent was 54 coins per marc, the mint price was 52 coins per marc. *: crying-up or crying-down only. +: fineness changed, type, weight and *LTV* unchanged.

	ME	MP		ME	MP
22 Sep 1359	*138	130	<i>Dauphin, Charles VII</i>		
6 Jun 1360	* 86.25	81.25	17 Jun 1418	104.727	94
9 Jan 1361	63	60	2 Jun 1419	150	144
13 Aug 1363	63	61	Aug 1420	320	300
5 Aug 1364	63	62	Jan 1421	340	320
11 Apr 1365	64	62.5	10 Aug	88.696	80
30 Aug 1368	64	62.9	26 Sep	88.696	85
12 Mar 1371	64	63.5	12 Sep 1422 ^b	80	78
18 Mar 1384	67.5	65.5	21 Jan 1423	80	80
5 Sep 1386	67.5	66	2 Mar	85	84
4 May 1387	69	66.5	Aug 1424	91.304	87.5
8 Apr 1391	69	67	7 Aug 1426	+114.545	108
1 Apr 1393	69	67.5	Nov 1426	* 95.455	90
28 Jul 1394	69.75	68.25	9 Nov 1427	+100	92.5
5 Nov 1411	72	70	Jul 1428	+105	97.5
5 Mar 1412	72	70.75	18 Jan 1429	+116.667	105
11 Oct 1415	72	72	9 Oct	80	77.5
10 May 1417	100.174	92	5 Apr 1431	80	77.5
20 Oct	+104.727	92	15 Oct	105	102
<i>Charles VI, Henry VI</i>			4 Dec	80	78.75
7 Mar 1419 ^a	166.957	150	28 Jan 1436	87.5	86.25
18 Jun 1419	*157.091	144	1 Sep 1437	87.5	87.5
2 Mar 1420	174.783	171.667	26 Apr 1438	87.5	86.25
13 Jul	209.739		19 Nov 1443	87.5	86.875
15 Jan 1421	279.652		12 Aug 1445	89.053	88.125
26 Jun	104.87		8 Jan 1447	99	97.75
11 Aug	78.75	76.5	26 May	+ 97.958	97.281
3 Jun 1423	78.75	77.5	18 May 1450	+100.605	99
6 Sep	78.75	78	16 Jun 1455	101.319	100
28 Jan 1435	87.5	86.25	3 Jan 1474	113.021	110
			2 Nov 1475	119.87	118.5
			24 Apr 1488	131.676	130.167

Table 10 (continued) ^a: Paris and Tournai only. ^b: The period 1422–1431 is complex. Toulouse and Tournai were also debasing, but with different MEs (MPs unknown). For Tournai: 9 Oct 1423, 78.652; 5 Aug 1429, 82.841; 1 Sep 1430, 86.786; 19 Sep 1431, 91.125. For Toulouse: Oct 1424, 104.727; Jul 1425, 83.478; 1 Mar 1426, 87.273; Jan 1428, 91.428; Feb 1428, 87.273; Dec 1429, 80; Jun 1430, 87.273; Jun 1434, 78.545.

England

		ME	Pence Mint Price		Halfpence		Farthings	
			English	foreign	ME	MP	ME	MP
	1278	242	236					
Dec	1279	243	224	226				
	1281	243	227.5	229.5				
Aug	1286	243	228	229.5				
	1290	243	228	231.5				
Jul	1335				252	225.6	254	233.6
Dec	1343	270	252					
Jul	1344	266	250.25					
Jun	1345	268	252.25					
Jul	1346	270	254.75		279	*	281	*
Jun	1351	300	284.25					
May	1355	300	288.44		*	*		
Mar	1361	300	290		*	*		
Apr	1412	360	348		*	*	*	*
Apr	1446	360	346		*	*	*	*
Apr	1448	360	346		*	*	*	*
May	1461	360	348		*	*	*	*
Aug	1464	450	396		*	*	*	*
Sep	1466	450	412		*	*	*	*
Sep	1467	450	418		*	*	*	*
Oct	1470	450	426		*	*	*	*
Apr	1471	450	432		*	*	*	*
Mar	1489	450	438		*	*	*	*
Nov	1526	506.25	495		*	*	*	*

Table 11: Mint Prices and Mint Equivalent of Silver, England (1278–1542). Prices are in pence per Tower pound (=349.91g) of sterling silver (11oz 2dwt or 92.5% pure). *: same mint equivalents and mint prices as for pence.

Source: Mayhew (1992), Tables 3 and 10, Appendix 2.

		ME	MP			ME	MP
Dec	1343	14.466	13.333	Dec	1445	16.167	15.875
Jul	1344	12.698	12.296	Aug	1464	20.833	18.333
Jun	1345	12.698	12.361	Mar	1465	22.5	21.458
Jul	1346	13.502	12.939	Sep	1467	22.5	21.775
Jan	1349	14	13.417	Oct	1470	22.5	21.975
Jun	1351	15	14.538	Apr	1471	22.5	22.125
May	1355	15	14.667	Mar	1489	22.5	22.375
Mar	1361	15	14.750	Jul	1526	24.75	
Apr	1412	16.167	15.875	Nov	1526	25.312	25.183
Feb	1422	16.167	15.917	Nov	1526	25.312	25.172

Table 12: Mint Prices and Mint Equivalent of Gold, England (1343–1526). Prices are in £ per Tower pound of standard gold (23 c $3\frac{1}{2}$ gr or 97.05% pure).

Source: Mayhew (1992), Tables 3 and 10, Appendix 2.

	Gold (£)		Silver (s)	
	ME	MP	ME	MP
Nov 1526	*27	26.863	45	44
May 1542	28.983	27.775	53.28	44.4
Apr 1544			+59.2	48.203
Apr 1545	31.563	28.932	+88.8	51.8
Apr 1546	+34.719	29.511	+133.2	51.8
Apr 1547	34.719	33.561	133.2	59.2
Jan 1549	35.771	34.719		
Apr			133.2	62.9
Jul 1550			133.2	74
Dec	28.8	27.15		
Apr 1551			266.4	111
Oct	35.552	35.416	60	59
Aug 1553	35.552	35.354	+60.545	59.074
Aug 1557			60.545	59.032
Nov 1560	+36		+60	58.5

Table 13: Mint Prices and Mint Equivalents of Gold and Silver, England (1526–60). Prices are in £(gold), shillings (silver) per Troy pound (=373.24g) of standard gold (96.44% fine) and sterling silver (92.5% fine) respectively.

Source: Gould (1970), Tables I and II.

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