

3.

Swedish Payment Systems 995–1534¹

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3.1. Introduction

In principle, a market economy could be based on barter – a simple exchange of commodities and services for other commodities or services (i.e. goods). But it is difficult to imagine a sizeable market in the absence of money. Money was, of course, a commodity just like other goods initially, but it has the property of being acceptable as payment for almost all other goods. This property makes it much easier for a buyer and a seller to conclude a deal, at least when people have confidence in the monetary system. In a pre-industrial society such a general trust may exist if the pennies are roughly of the same size and carry the same quantity of intrinsic value. During the Swedish Middle Ages this intrinsic value consisted of silver in the pennies.

In times of monetary stability, medieval pence could readily be used as units of account (price tags) when goods needed to be valued, making exchange even easier. Some people believe that price stability is a modern idea, but many a medieval source makes it clear that keeping money stable was considered to be an important virtue for the regent.² In Sweden, as in other European countries, there were periods of stable money that helped market exchange to flourish, as well as periods of royal counterfeiting and economic decline. Many medieval economic problems can be attributed to the swings between stability (trust) and money debasement (distrust).

In Sweden, the basic currency unit during the Middle Ages was the mark, which existed up to 1776. There was a difference between the silver mark and ‘mark penningar’ (the mark in pennies). A silver mark was a weight measure, while the mark penningar was the currency unit. In the Middle Ages, the mark penningar was a unit of account. It was not until the 16th century that a coin was minted with the value of one mark penningar.

1 We want to thank especially Lars O. Lagerqvist and Cecilia von Heijne for comments on this chapter.

2 Spufford (2000, p. 59), and Franzén (2006, p. 66).

When discussing the medieval payment system in Sweden it is also important to problematise the concept of Sweden. The boundaries of Sweden changed during the Middle Ages and they differed from what they are today. Finland was conquered in the 12th and 13th centuries. Scania (Skåne), Blekinge and Halland in the south belonged to Denmark for most of the Middle Ages, apart from a brief period in the 14th century (Scania was part of Sweden in 1332–66). Gotland in the Baltic Sea belonged to Sweden up to the 1360s, when it was lost to Denmark. During the 14th century there were several personal unions between Nordic countries, for example between Sweden and Norway in 1319–55 and 1362–63. They eventually lead up to the Kalmar Union, which is a term for a series of personal unions between Sweden (including Finland), Denmark and Norway in 1397–1523, although technically the countries did not relinquish their sovereignty. The Union split into two parts – Denmark-Norway and Sweden (including Finland) – in the early 1520s. There were also important differences within the borders of the Swedish realm, reflecting a feudal decentralisation of the monetary system.

3.2. Coins, Cash and Credit in Medieval Sweden

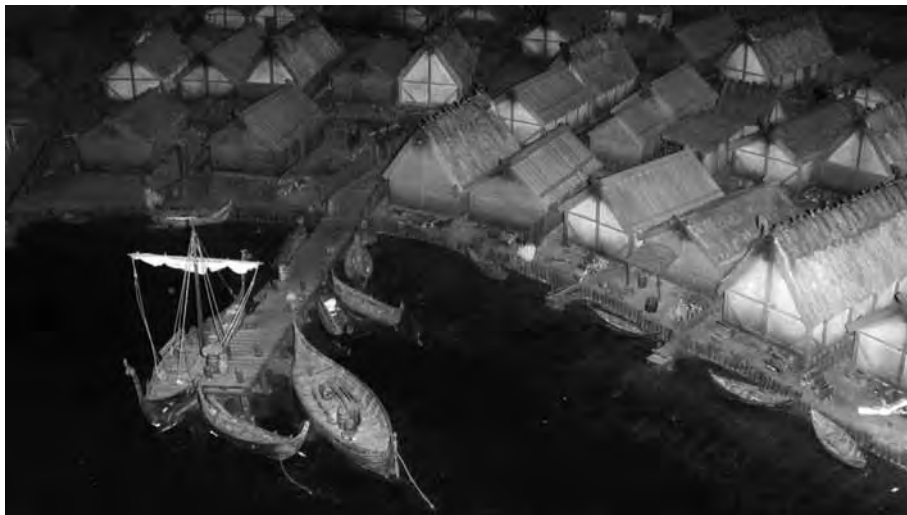
The first Swedish coins were made in the town of Sigtuna on Lake Mälaren (north of present-day Stockholm), probably in the year 995,³ and at roughly the same time in Norway. Those coins were minted in as pure silver as was possible a thousand years ago and they were produced by a Christian king in surroundings that were still rather pagan. But since the mint die prototype was of Anglo-Saxon origin, the monarch depicted on the pennies was the English king Ethelred, not the Swedish king Olof Skötkonung. This early minting occurred at the end of what we today call the Viking Age. In neighbouring Denmark, minting had already been practiced on and off since the 820s. But unlike the more advanced Denmark and Norway, Sweden discontinued minting sometime in the 1030s. This is indeed an economically puzzling lacuna that lasted for more than a century. The Viking Age, with its networks of international exchange, came to an end in the middle of the 11th century; together with other signs of diminishing external trade, one is tempted to see this long interruption in Swedish minting as part of a period of economic stagnation.⁴

We do not have a single written contemporary record that mentions the Sigtuna pennies. Thus, we do not know how (or even whether) they were tallied. In fact we do not know if they were used at all in market transactions. The first minted coins played just a marginal role, and circulating silver was completely dominated by foreign coins.⁵ When minting restarted in the 12th century, it did so in the southern parts of the realm. That is to say, first on the island of Gotland in the 1140s and in the province of Västergötland (West Gothland) in the 1150s (Geatish pennies).

3 Lagerqvist (1970, p. 16).

4 Heckscher (1941, pp. 65–6).

5 Jonsson (1995).



A model of Birka, a Viking town 1200 years ago, at the Museum of National Antiquities in Stockholm. Birka in Lake Mälaren was established in the 8th century and became an important international trading port. As far as we know, no Swedish coins were minted at that time but foreign coins, mostly Arabic, circulated widely.

These two kinds of new penny were very different in appearance from the Sigtuna coins and were (up to roughly the year 1300) sometimes minted on one side only. What is more, the appearance of the new Swedish pennies varied according to where in the kingdom they were minted, reflecting that European society was characterised by political and economic decentralisation, including the introduction of monetary systems that were based on local institutions, rather than on institutions of a centralised monarchy.

A *provincially based monetary system* had already been introduced in the late 1020s in Denmark, when Cnut the Great abandoned his uniform money for the whole of Denmark in favour of two monetary systems – for the eastern and western parts of the country, respectively. German patterns may have inspired the Danish king,⁶ and such a decentralized monetary structure was to become a characteristic sign of the *feudal system*. The Danish and Scanian marks were still valued differently in the 14th century (see Table A3.3).⁷ Later, Sweden became a typical feudal example with more than one monetary system in use well up to the early 16th century. Not only did the different pennies in Sweden have different intrinsic values, they were also tallied in different ways.⁸

6 Hybel and Poulsen (2007, p. 327).

7 Hybel and Poulsen (2007, p. 333).

8 Klackenborg (1992, pp. 180–1), and Jonsson (2002, p. 46)



Silver coins and other silver objects from the late Iron Age.

Photo: Gabriel Hildebrand/Museum of National Antiquities (in Stockholm).

Up to at least the end of the 13th century, five different types of penny were minted inside what are Sweden's borders today and each type was tallied in its own way. There were Geatish pennies, Svealand pennies, Gotlandic pennies, Scanian pennies and pennies from the county of Jämtland. The last two types of penny were part of Danish and Norwegian minting, respectively, while the first two types – Geatish and Svealand pennies – were united into a single mainland monetary system, Swedish pennies, sometime around the year 1300. Gotlandic pennies have been found in many places round the Baltic Sea and played an important role in the south-eastern part of mainland Sweden up to at least the 1260s,⁹ but also later in the 15th century.

Thus, up to the late 13th century there were regional variations in the currency system. The following relation: 1 mark = 8 öre = 24 örtug, held everywhere in Sweden. However, while one mark was equal to 192 Swedish pennies or penning (plural: penningar) in Svealand, in Götaland/Geatland/Gotland (mainly in Värmland, Dalsland and Västergötland) it equalled 384 penning (i.e. 1 penning of Svealand = 2 penning of Götaland) and in Gotland it equalled 288 penning (the coins of Gotland also circulated in Öland, Småland and Östergötland). What is now the south of

⁹ Klackenborg (1992, p. 183).

Sweden (Skåne, Blekinge and Halland) belonged to the Danish system, where initially one örtug was equal to 10–12 penning.¹⁰

When the Swedish mainland got the same currency system around 1300, the Svealand system was adopted, i.e. 1 mark = 192 penning also in Götaland. This transition to a common monetary system was part of the state formation process. However, Gotland (which Denmark conquered in the 1360s) retained its own system.¹¹ The Gotlandic mark (mark gutnisk) was of the same or lower value than the Swedish mainland mark (see Table A3.2).¹² From 1340 a coin of higher denomination called gote was minted in Gotland.

Initially, the division into mark, örtug and penning was a common Nordic system. In the 14th century Denmark and Norway adopted the German system, where 1 mark = 16 skilling = 192 pennies. Gotland and Götaland adopted the Danish counting system from around 1450.¹³

All through the Middle Ages (as well as later) foreign coins were also in use in Sweden. This phenomenon can be seen as a typical feudal trait. One use of foreign money was for trade in export harbours such as Stockholm and Kalmar or cross-border trade in the regions that were close to Norway and Denmark. Thus, Danish and German coins were often in use in the forested province of Småland.¹⁴ Foreign money was also in use when the domestic coin was debased (see below) and when the Crown for one reason or another ceased to mint, as seems to have been the case in Sweden in several years around 1400.¹⁵

There are many examples of exchange rates on foreign coins. The most frequently mentioned up to the mid-14th century were English and French silver coins. In Denmark in 1332–52, the gros tournois functioned more or less as an official norm for the monetary system.¹⁶ After 1350, German coins and various foreign gold coins came to play a larger role. No gold coins were minted in Sweden during the Middle Ages.

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The Swedish pennies have not left many traces in the written sources from the mid-12th up to the mid-13th century. This silence, together with the fact that the coins – like their Viking Age forerunner – were still made of almost pure silver, raises the question of how they were used in an economic context. Contemporary sources mention that pennies were weighed out, indicating that they were treated as bullion

10 Hildebrand (1894, vol. I:2, p. 773).

11 Franzén (2006, p. 40).

12 Franzén (2006, pp. 156–8).

13 Jonsson and Östergren (1998) and Hallenberg (1798).

14 Klackenbergh (1992, pp. 183–4).

15 Hildebrand (1894, vol. I:2, p. 842), and SDhk 16586.

16 Fauerholdt Jensen (1990, p. 16).

rather than money (including foreign coins).¹⁷ In the second half of the 13th century the production of coins increased in the realm, and references in the sources indicate that they were in regular use in the expanding markets. Archaeological evidence suggests that at the turn of the 14th century money was commonly used not only among aristocrats and burghers, but also among peasants in the countryside. Only the far-northern part of Sweden, with its populated river valleys, was still outside this modernization.¹⁸

There was undoubtedly a trend towards using more and more money in economic transactions in Sweden. This tendency was intensified during the Late Middle Ages (1350–1527), albeit with periods of severe monetary setbacks. From the mid-13th century – even earlier on the island of Gotland¹⁹ – the trend in Sweden was for new coins to have less and less intrinsic value; in other words, Swedish pennies included more and more copper at the expense of their silver content. This was not confined to Sweden. The same phenomenon is clearly evident in the more advanced regions in western Europe. Older coins with a higher intrinsic value were melted down or tallied in a higher nominal than the new coins.²⁰

Under such circumstances – when a coin’s debasement was characterized by transparency – it was a modernizing step (towards today’s money, which has no intrinsic value). Another point to note is the importance of money in the special function of *legal tender*, that is, when the regent accepts his coins as payment of taxes. Such a benevolent royal attitude can be seen as a way of raising the market value of money and helping trade to expand.

This was clearly the case during long periods in the Middle Ages, but there were times when a fiat type of money appeared. This was not uncommon in states of crisis, such as during wars and outbreaks of the plague, or simply as a result of royal incompetence. In the 1350s, 1360s, 1510s and early 1520s emergency coins, consisting almost entirely of copper, were minted in Sweden. Archaeological finds have shown that several types were covered with a thin layer of silver in an attempt to make them look much more precious than they really were.²¹ Such a swindle could possibly result in large profits for the Crown, but not for long. The disclosure of such a fraud severely undermined confidence in the monetary system.

Goods other than coins were also used for transactions in medieval Sweden. Primitive barter, where one good was simply exchanged for another good, was still practiced in Sweden but there was also an exchange of goods against goods in the markets that were part of what we might call a *monetarised economy*. Since money is just one good among other goods (see above), it was often not possible for a buyer to provide the seller with coins. But medieval man created several witty methods of solving this

17 Klackenberg (1992, p. 185).

18 Klackenberg (1992, p. 179).

19 Myrberg (2008, p. 181).

20 Hildebrand (1894, vol. I:2, p. 936), and Franzén (1998, p. 222).

21 Malmer (1980, p. 58), and Franzén (2006, pp. 77–8).

problem. One was the construction of credit institutions such as pawns and guarantors. Another was to use goods other than money as if they were money, so called *intermediary goods*.²² In fact, intermediary goods can be regarded as money if they are valued in monetary terms. Silver spoons and iron are two examples of popular substitutes for coins and they were often given a price tag in monetary terms when used as cash or credits (pledges) in the markets.²³ Charters that can be described as mortgage deeds expressed in monetary terms are known from as early as the second half of the 13th century (when real property was pawned).²⁴ *All in all, payments in ready money, in mints, were an exception rather than a rule in medieval economic transactions.*

3.3. The exchange rate between mark penningar and mark lödig

For the 16th century, the gross weight of one silver mark (*mark lödig*) is generally assumed to have been 210.616 grams of silver, which amounted to 9/10ths of the Cologne mark (233.8 grams). Up to the 14th century, it was not uncommon for purchases of land and other relatively large transactions to be made in silver marks, that is, in weighed silver. The fact that the payment was in weighed silver was sometimes explicitly recorded.²⁵

Payment could also be in weighed gold; this was not rare in early transactions. In what may be the earliest recorded purchase of any kind in Sweden, King Knut announced that he had exchanged one of his farms for landed property in the province of Södermanland owned by a monastery. In this transaction, which took place some time between 1167 and 1185, the monks also paid 12 marks in gold.²⁶ Another early document, from the province of Småland, records the purchase of fishing water by the Nydala monastery for three marks in gold. This transaction was confirmed by the King in about 1192.²⁷ Payment in weighed gold became less common after the mid-13th century.

Due to successive debasement of the coin, the mark penningar deteriorated relative to the silver mark during the Middle Ages, from 1:3 in the second half of the 13th century to 1:16 in the late 1510s.²⁸ As mentioned above, no mark coins were minted until the 16th century.

The term ‘mark lödig’ is known from 1341 onwards. Before that the Latin term ‘*marchas argenti puri*’ (mark pure silver) was commonly used. Although we know roughly how much silver these terms referred to, there is some uncertainty about the

22 Heckscher (1941, pp. 45–6).

23 Franzén (1998, pp. 257–261).

24 Franzén (2006, pp. 50–1).

25 See, e.g., SDhk 761, and Hildebrand (1894, vol. I:2, pp. 938–9).

26 SDhk 214.

27 SDhk 268. See also SDhk 287.

28 Hildebrand (1894, p. 933) and Thordeman (1936, p. 92).



*A scale from the late Iron Age. Various medieval monetary units – such as mark, öre, örtug and penning – developed from weight measures with the same names.
Photo: Museum of National Antiquities (in Stockholm)*

gross weight, the fineness and whether it was minted or unminted silver. During the Middle Ages there seems to have been a shift in the meaning of this term. Mark lödig came to denote a gross weight rather than (almost) pure silver.²⁹

During the early Middle Ages the mark silver, which was a common Scandinavian measure, probably varied somewhat between regions. According to Hans Hildebrand, the mark was 209 grams in Stockholm, 215 grams in Skara and 218 grams in Uppsala.³⁰

One uncertainty concerns the purity of mark lödig or *marchas argenti puri*. Chemically pure silver was not available before modern times. The maximum purity of silver in the Middle Ages was probably 95–96 per cent. If the silver mark contained only 85–95 per cent pure silver, its fine silver content would then be only 180–205 grams.³¹ To complicate matters, the term mark silver (Latin: *marcha argenti*) could differ in meaning from *marcha argenti puri* and refer to a significantly lower unit of value³² (for example, the mark silver of Riga and Gotland in the 14th

29 *KHL*, 'mark'.

30 Hildebrand (1894, p. 757).

31 *KHL*, 'mark'.

32 Hyötyniemi (1999, p. 8).

century, discussed below). In Sweden, however, the term mark silver (*marcha argenti*) was mostly synonymous with *marcha argenti puri*.³³

In 1272, a source from Forsheda in Småland counted the mark silver or mark sterling as 144 sterling coins. Since the fine silver content of the sterling was 1.338 grams,³⁴ this mark silver contained 193 grams fine silver. In another source, from Lübeck in 1267, the mark sterling is counted as 160 sterlings (see Table A3.7). From these two sources it can be established that the Swedish mark silver or mark sterling was 90 percent of the mark sterling used in Lübeck, which is exactly the relation between mark lödig and the Cologne mark in the 16th century. However, this determination of the mark silver is not consistent with all sources. Moreover, the exchange rate in Sweden probably differed from that abroad.

In 1282, the Vatican put the Swedish silver mark as equal to 0.8532934 marks of Troy weight, which in turn was valued 160 sterlings, implying that the Swedish mark silver was set equal to only 136.5 sterlings or 182 grams fine silver in sterling coins (1.332 grams fine silver per sterling). According to the same source, the Danish mark silver was 4 per cent larger than the Swedish.³⁵

In 1334, 1 mark silver was set equal to 5 marks penningar, and 15 marks pennin-gar to 160 gros tournois (see Table A3.6).³⁶ Since the fine silver content of 1 gros tournois was 3.6 grams, the relation would imply that 1 mark silver contained 192 grams fine silver in gros tournois.

Brita Malmer shows that the fine silver content of the penning-coins in the early 14th century was 0.21 grams for group Kr H Ä I and 0.23 grams for group E H L S.³⁷ The exchange rate for the mark silver in the early 14th century was in the range 1:4.5 – 1:5. Assuming that the lighter coins, group Kr H Ä I, circulated at the exchange rate of 1:5, that would imply that 1 mark silver was equivalent to around 200 grams pure silver, or 210 grams silver of 95–96 per cent fineness.³⁸

While during the 13th century and the first half of the 14th century the mark silver probably referred to minted silver of close to 90–95 per cent purity with a gross weight of 210–220 grams, in the 15th century the term mark lödig probably referred to unminted silver, which could be somewhat less pure. The value of unminted silver was lower than that of minted domestic coins in the late 14th and early 15th centuries (see Figure 3.2), i.e. free minting must have been restricted in one way or another, increasing the seignorage rate. Although Hans Forssell argues that in 15th century Lübeck the fine silver was of 98 to 99.5 per cent purity,³⁹ i.e. as fine as silver could

33 For an example, see SDhk 2506.

34 Lindert (2006).

35 SDhk 1207. See also Fauerholdt Jensen (1990, pp. 32 and 81).

36 See also Franzén (2006, p. 157, table 5:5).

37 Malmer (1980, pp. 15-19 and 242).

38 The coins containing a larger amount of silver, belonging to group E H L S, must have circulated at a somewhat better exchange rate than 1:5, since assuming such a rate for these coins implies that the mark silver contained 220 grams pure silver, which seems rather unlikely.

39 Forssell (1872, p. 35).

be made at that time, the Swedish mark lödig probably referred to silver of much lower purity. In 1479, goldsmiths were obliged to use silver of 14.5/16 (90.625 per cent) fineness (16 so-called lod = 100 per cent pure silver). In Västerås in 1524, a document refers to the mark lödig of 14/16 fineness (87.5 per cent pure silver), and in 1523 the melting of one mark lödig showed that its silver was of 13.75/16 fineness (85.9375 per cent pure silver).⁴⁰

In accordance with these sources, the assumption in the present study is that the silver mark was of 15/16 fineness up to 1350 and then linearly decreased to 14.5/16 fineness in 1479 and to 14/16 fineness in 1524. This implies that the silver mark contained 197 grams fine silver in 1350, 191 grams in 1479 and 184 grams in 1524 (see Table A3.1).

In 1375–1400, the mark lödig was valued around 6 mark örtug, which contained around 150 grams fine silver in örtug coins. In 1420–40, the exchange rate of the mark lödig was quite stable at around 8.25 marks örtug, which contained around 170–175 grams fine silver in örtug coins.⁴¹ In 1528, 1 mark lödig was worth around 20 marks örtug, which contained 177 grams fine silver in öre coins.⁴² This implies that örtug coins usually circulated significantly above their intrinsic metal value.

During the late Middle Ages many foreign silver coins seem to have circulated at a lower value per unit of silver than the domestic coins, or at roughly the same value as unminted silver, a clear difference with the situation in the early Middle Ages. For example in 1460, 1 mark lödig was worth around 7.7 marks of Lübeck, which contained around 180 grams fine silver. In 1484, 1 mark lödig was worth around 10 marks of Lübeck, which contained around 200 grams fine silver.⁴³

From the late 13th century, the downward trend in the fine silver content of the mark penningar was practically continuous and particularly notable in three periods: the decades around 1300, the early 15th century and the early 16th century. In addition, temporary dips occurred in the 1350s, 1360s and early 1520s. These periods of debasement were characterized by war and civil strife, presumably pressing the rulers to use less silver in the coins.

Figure 3.1 describes the fine silver equivalent of one mark penningar in 1277–1539. By the latter date, the mark penningar held only one tenth of the amount of silver it had contained in the late 13th century. The graph is based on around 800 quotations stating the value of the mark penningar relative to the silver mark. With the exception of land prices, this is probably the densest economic series available for medieval Sweden. The large number of quotations indicates the importance that was attached to documenting the relationship between mark silver and mark penningar in economic transactions. Most of these transactions concern sales of landed prop-

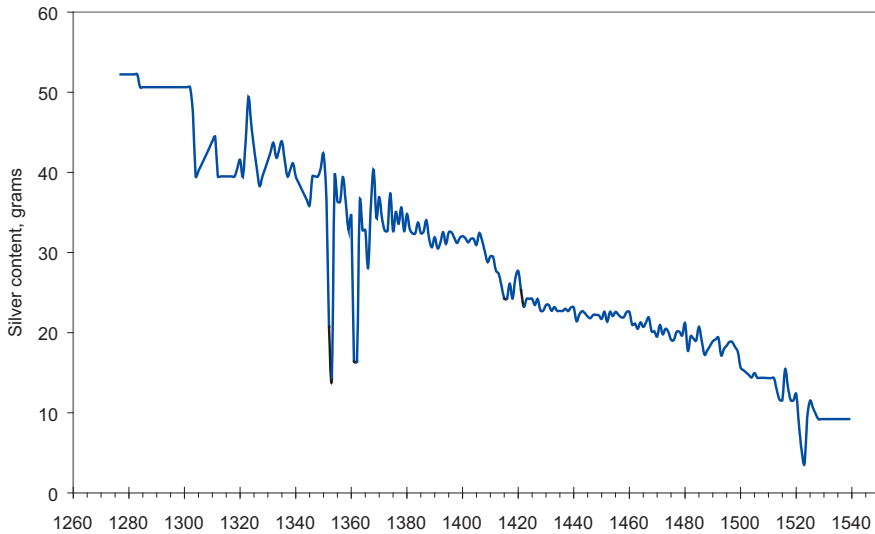
40 *KHL*, 'mark'.

41 Thordeman (1936, p. 39), and Table A3.1.

42 Wallroth (1918, p. 19).

43 Forssell (1872, p. 35).

Figure 3.1. Silver equivalence (grams) of one Swedish mark (mark penningar), 1277–1539, based on the exchange rate on mark silver (mark lödig).



Source: Table A3.1.

erty, which of course represented relatively large sums of money at the time. The annual values are found in Table A3.1.

Specifying the exchange rate of the mark penningar relative to the silver mark eliminates one source of uncertainty in economic transactions. The seller was assured that he/she would not receive payment in debased money, and the buyer could be confident that there could be no future claims for payment.

3.4. Exchange rates in the 12th and 13th centuries

The second half of the 12th century and the 13th century (mainly the latter) saw a monetarisation of the economy. While coins played hardly any role in the life of an ordinary peasant around the year 1200, a century later this was no longer the case.⁴⁴ A large part of the economy had been monetarised, even though barter still dominated exchange.

The silver coins that circulated up to the 12th century were not fully monetary objects.⁴⁵ They had to be weighed and were worth just their value as silver metal.

⁴⁴ Klackenberg (1992), and Holmberg (1995, p. 64).

⁴⁵ Klackenberg (1992, p. 185).

They were not distinct from other silver objects.⁴⁶ These coins served as a medium of exchange, but only in limited contexts (i.e. they were only special-purpose money).⁴⁷ In contrast, in the more developed parts of Europe (Western and Central Europe) the coins were counted since their face value was guaranteed by the ruler. As late as in the second half of the 13th century, a payment of 20 marks silver was made by weighing up pennies of Sweden and Gotland,⁴⁸ although there are also examples of Swedish coins being counted from this century.

The earliest evidence of exchange rates refers to the last decades of the 13th century. Petter Dijkman wrote in 1686 that he had access to old sales documents stating that 1 mark silver was worth 3 mark penningar in the years 1277–83, 1289 and 1298.⁴⁹ For 1335 and 1350, he puts the exchange rate at 1:4.5. The sales documents from 1277–89 no longer exist, but it is quite likely that Dijkman did have access to documents that have now been lost. Dijkman was careful only to use direct sources as evidence of early exchange rates. The exchange rates he reports from the 1290s onwards are confirmed by other sources that still exist. For the period 1277–82, the Vatican valued 1 mark in Troy weight at 5.344 Swedish mark penningar, and (as mentioned above) 1 Swedish mark silver at 0.8532934 marks of Troy weight, implying: 1 Swedish mark silver = 4.56 Swedish marks penningar.⁵⁰ In 1291, two different sources valued the mark silver at 3 and 4.25 marks penningar, respectively.⁵¹ Another source sets the value of 1 mark penningar at 10.2 gros tournois in 1291, implying that the fine silver content of 1 mark penningar was just 41 grams (see Table A3.6). Assuming that 1 mark silver contained 197 grams fine silver, this would entail an exchange rate of 1:4.8 between mark silver and mark penningar in 1291. Thus both Dijkman's and the Vatican's exchange rates for the 1270s and 1280s were still prevalent in the early 1290s.

The large differences in exchange rates in the late 13th century were most likely due to the parallel circulation of older and newer pennies that contained different amounts of fine silver. By the early 14th century, the older higher-valued coins had been withdrawn from circulation.

No written sources seem to exist on the exchange rate before the 1270s. Opinions about the development of the exchange rate between mark silver and mark penningar during the course of the 12th and 13th centuries fall into two main categories.

46 See Spufford (1988, p. 67). Stanley Jevons (1875, ch. Ix) describes this as a 'system of currency by weight'. He also points out that such a system was practiced in his own time (the 19th century). He writes: 'In all large international transactions, again, currency by weight is the sole method. The regulations of a state concerning its legal tender have no validity beyond its own frontiers; and as all coins are subject to more or less wear and uncertainty of weight, they are received only for the actual weight of metal they are estimated to contain.'

47 Thurborg (1989).

48 SDhk 761.

49 Dijkman (1686, pp. 78-79).

50 SDhk 1207. See also Fauerholdt Jensen (1990, pp. 81 and 85).

51 Franzén (2006, p. 294).

Some researchers, for example Hildebrand and Bengt Thordeman, assume that the mark penningar was equal to the silver mark in the 12th century, when minting was resumed in Sweden, and the beginning of the 13th century.⁵² This view presupposes successive debasements during the 12th and 13th centuries. The other view is that there was no such equivalence in the 12th century.

Brita Malmer argues that the deterioration in the value of mark penningar took the form of decreasing fineness rather than a reduction of the coin's weight. This is logical since a decrease in weight is easier to detect than a decrease in fineness. A decrease in fineness can be observed during the course of the Middle Ages, while the weight of the Swedish pennies remained stable. While the gross weight of Swedish coins was unchanged during the 13th century, their fineness decreased by around 15–20 per cent.⁵³

To argue for equivalence between mark silver and mark penningar in the 12th century, Thordeman has to assume that the 12th century coins were $\frac{1}{4}$ penning coins. However, it is also likely that the relation between mark silver and the mark in penning coins was initially adjusted to international conditions. In Denmark, the relation between mark silver and mark penningar was 1:2 to 1:3 (see Table A3.3). It is entirely possible that this was also the relation in Sweden when minting was resumed in the 12th century. This is consistent with evidence that the intrinsic metal value of Swedish coins did not decrease substantially during the course of the 12th and 13th centuries and that the relation 1:3 can be confirmed by written sources in the late 13th century.

The provincial law of Uppland, confirmed by the King in 1296, mentions two different mark currencies: mark karlgill and mark köpgild. 1 öre karlgill was equal to 12 penning and 1 öre köpgild to 8 penning. Mark karlgill has been interpreted as mark silver, implying that the exchange rate between mark silver and mark penningar was 1:1.5 not long before the Uppland law had been written. Dovring argues quite convincingly that this is unlikely considering the much larger value difference between mark silver and mark penningar in this period.⁵⁴ The existence of a better mark, not equal to the *marcha argenti puri*, alongside the mark in common circulation was a frequent phenomenon during the Middle Ages (not least as a safeguard against the deteriorated currency). For example, in Norway the term mark forngild was used in the 14th century and had the same value as the 13th century mark in pennies.⁵⁵ In late 13th century Sweden, the exchange rate of mark silver for mark penningar varied from 1:3 to 1:4.5 (both exchange rates are confirmed by written sources, as mentioned above), i.e. the ratio between the lowest and the highest rates was the same as between mark karlgild and mark köpgild. During the Middle Ages it was not unusual for various fines (more fixed in time) to be paid in better currency,

52 Hildebrand (1894, vol I:2, p. 933), and Thordeman (1936).

53 Malmer (1980), and Hemmingsson (2005).

54 KHL, 'mark', and Dovring (1951).

55 Hyötyniemi (1999, p. 8).

while market transactions (which were more variable) were allowed to be made in the deteriorated currency; the latter occurred, for example, in Götaland during the 1410s when the debased Gotlandic coins drove out the better Swedish mainland coins (see below).⁵⁶

3.5. The debasement cycles of the 14th century

In Sweden, periods of high inflation caused by debasement cycles are not documented prior to the 16th century but there are certain indications that debasement cycles did occur earlier. Most notably in the 1350s and 1360s (following the Black Death), the fine silver content of minted coins decreased substantially.

A Swedish coin is mentioned in 1358 that was reduced to one-third of its value against the Norwegian coin, whereas it had recently been at par with the latter. In Kalmar, 1,919 mark penningar were minted in inferior coins in 1361–3 and 785 mark penningar in better coins in 1364–5.⁵⁷ Hence it is possible that two debasement cycles occurred, one in the 1350s and the other in the early 1360s. Another source relates that the payment of Peter's pence in 1356–62 was made in a coin that was 'bad, and of no or inferior value'. When the peasants in 1363 wanted to pay the tax to the Pope in the same bad coins, the tax collectors refused to accept a coin that had been withdrawn from circulation.⁵⁸ A better coin was introduced in that year.

Bengt Thordeman and Brita Malmer have studied two different types of penning: ME II:1 (Th XX) and ME II:2 (Th XXI), which were minted at end of the reign of King Magnus IV Ericson (1319–64).⁵⁹ Both were substantially debased compared to earlier coins. While the fine silver content of the one penning coin minted during the 1340s (ME I:2 or Th XIX) is, on average, 0.22 grams (implying that 1 mark penningar contained 42 grams of fine silver), the fine silver content of ME II:1 varies between 0.02 and 0.17 grams and of ME II: 2 between 0.05 and 0.1 grams. Assuming that both ME II: 1 and ME II: 2 were one penning coins, 1 mark penningar of ME II: 1 contained 4 to 33 grams of fine silver, while 1 mark of ME II: 2 contained 10 to 19 grams of fine silver.

Thordeman concludes that ME II: 1 and ME II: 2 were, in fact, half-penning coins. However, Malmer disagrees; the very large variation in the fine silver content of ME II: 1 rather indicates a gradual deterioration of the coin, which is typical for a debasement cycle (for example, during the 16th century in Sweden). According to Malmer, an ME II: 1 coin had a fine silver content that at its highest, 0.17 grams, was 20–25 per cent less than that of the previously minted 1-penning coins, and therefore it could not have been a half-penning-coin.

⁵⁶ See footnote 102.

⁵⁷ Golabiewski Lannby (1995, pp. 93–4), Rasmusson, (1943, p. 271), Hildebrand (1894, vol. I:2, p. 935), and SDhk 8633.

⁵⁸ Hildebrand (1894, vol. I:2, pp. 830–1).

⁵⁹ Malmer (1980, pp. 22–3), and Thordeman (1936, pp. 33–4).



A minted örtug from Åbo in Finland in the second half of the 14th century; it contained around one gram of fine silver. At that time, one örtug was a male unskilled labourer's pay for around four hours' work in Stockholm (its equivalent in the late 1990s would be a 500-kronor note). It could buy around 0.9 kg of butter or four litres of beer.

Photo: The Royal Coin Cabinet, Stockholm.

The circulation of the worst coins would imply a tenfold increase in prices, assuming that prices followed debasement. However, prices are missing for several years.⁶⁰ Although direct exchange rates between mark silver and mark penningar are missing for the years when the deterioration in value most likely took place (1352–3 and 1361–2), there are two notations on foreign coins. Using cross exchange rates, these two notations provide information about the value of mark silver in mark penningar. The two quotations show that the exchange rate deteriorated substantially, although not as much as the decrease in the fine silver content of the most debased coins.

In March 1351, one mark silver in Cologne weight was still valued at 6 marks penningar (i.e. 1 mark silver in Swedish weight = 5.4 marks penningar).⁶¹ In July 1353, 50 Flemish marks groschen were valued at as much as 950 marks penningar, i.e. 1 Flemish mark groschen = 19 marks penningar.⁶² The mark groschen was equal to 120 groschen or ½ pound groschen. In 1353, 1 mark groschen was valued at 6.2882 gold florins or 3.875 marks of Lübeck.⁶³ Since the mark silver was usually worth 4.5 gold florins⁶⁴ or 45 schillinge of Lübeck, this would imply that in 1353, 1 mark silver was valued at 13.6 or 13.8 marks penningar, 13.7 being the average. This

60 Franzén (2006, pp. 77 and 232).

61 Fritz and Bäärnhjelm (1990, no. 759).

62 SDhk 6594.

63 Spufford (1986, pp. 215 and 227).

64 In 1363, 1000 marks silver in Cologne weight were valued at 5000 gold florins, i.e. 1 mark silver Swedish weight = 4.5 florins. See Fritz and Bäärnhjelm (1990, no. 1295).

exchange rate is consistent with the notation that the debased coins were later reduced to one-third of their nominal value.

Papal sources show that a new coin was introduced on February 22nd 1354 and they clearly distinguish between coins collected before and after that date. The old coin was collected throughout the period 1351–3, which shows that the debased coins could have been in circulation during that time.⁶⁵ The new coin must have been a better one, since in both 1355 and 1356, one mark silver in Cologne weight was valued at 6 marks penningar (i.e. 1 mark silver Stockholm weight = 5.4 marks penningar).⁶⁶

Sources from 1352 and 1353 refer to mark penningar as paid in either proper coins (*prompta pecunia*) or common coins now in circulation (*vsualis monete nunc currentis*), which shows that older, better coins probably circulated at a premium alongside debased coins.

In December 1361, the fee to Vadstena monastery was set at ½ penny of Lübeck or at one or several Swedish pennies, depending on the current value of the coins (*pro qualitate monete tunc currentis*).⁶⁷ During the stable currency, 1 Swedish penny was equal to ½ penny of Lübeck. This example clearly shows that various coins circulated at quite different exchange rates, and that 1 mark silver was valued at maybe between 5.5 (since 1 mark silver was worth around 2.75 marks of Lübeck) and 10–20 marks penningar, depending on the rate.

The only price quotation from when the debasements took place (1352–3 and 1361–2) is for copper in 1361, when copper was valued at 50 marks per ship pound,⁶⁸ the highest notation in the whole of the Middle Ages. By way of comparison, in 1366–7 copper was sold for 25 marks per ship pound and in 1333 for 10 marks per ship pound. Assuming that the exchange rate between mark lödig and mark pennin-gar stabilised at 1:6 after 1363, the price of copper in 1361 indicates an exchange rate of (at least) 1:12.

The newer coins that circulated during the reign of Albert of Sweden (1363–89) had a lower fine silver content than the better coins which circulated before the mid-14th century. During this period the örtug was struck as a coin for the first time, copying the German Witten.⁶⁹ Earlier the örtug had existed only as a unit of account equal to 8 penning. Its fine silver content was 1.05 grams, implying that the fine silver content of 1 mark penningar had decreased to just 25 grams,⁷⁰ a decline of around 60 per cent since the first half of the 14th century. However, the exchange rate of the mark silver in mark penningar decreased by only around 20 per cent from the level in the first half of the 14th century, an indication that coins circulated at a

65 Fritz and Bäärnhjelm (1990, no. 909), and SDhk 6799.

66 Fritz and Bäärnhjelm (1990, no. 952 and 969).

67 Fritz and Bäärnhjelm (1990 no. 1243).

68 SDhk 8007.

69 Malmer (1980, p. 33).

70 Thordeman (1936, p. 90).

value significantly above their intrinsic metal content, allowing a substantial increase in the seignorage rate.

3.6. The gold:silver exchange rate

Silver and gold were both considered to be scarce in Sweden. In the early 1320s, papal emissaries reported that the money they had collected in Sweden had to be kept in the form of the domestic currency, since the scarcity of gold and silver prevented its swift exchange. Some of the money had been transformed into useful things ('res utiles'), such as horses.⁷¹

Foreign gold coins were readily accepted in Sweden. The florin (Latin: floreni), the Florentine gold coin with a weight of 3.53 grams, began to be minted in 1252 and quickly became the dominant international trading coin. It is mentioned in Swedish sources from the end of the 13th century and appears frequently during the 14th century, especially in connection with the activities of papal emissaries.⁷² During the 15th century, use of the Florentine florin seems to have declined in Sweden; it was partly replaced by the Hungarian florin, which held the same weight and fineness as its Italian counterpart.⁷³



A florin from 1347.

Source: Wikipedia, 'Italian coin florin'.

71 Fritz and Bäärnhielm (1990, no 37).

72 The earliest mention in Sweden appears to be in a letter from 1297 which records a payment of 500 florins by the archbishop at Uppsala; SDhk 1760.

73 Hildebrand (1894, vol. I:2, pp. 906 and 911).



Hungarian florin struck in 1353–7.

Source: Wikipedia, 'Guilder'.

English gold coins were in frequent use in Sweden during the 15th century. The large coins, nobles, minted during the reign of Edward III, were particularly popular.



A noble, minted in London in 1354–5. The obverse (left) depicts the king standing in a ship.

Source: Wikipedia, 'Noble (English coin)'.

During the latter part of the 15th century, nobles were increasingly replaced by German gyllen or gulden. These coins were minted in several parts of Germany. The

most widely used type in Sweden was the Rhinish gulden (Latin: *floreni rinenses*; Swedish: *rhensk gyllen*). As these coins became widespread during the late 15th and early 16th centuries, it became more common to specify the exchange rate between mark penningar and the Rhinish gulden, rather than the rate of the domestic coin to the silver mark.⁷⁴



A Rhinish gulden from Mainz, minted between 1399 and 1402.

Source: Wikipedia, 'Guilder'.

The earliest information on the exchange rate between gold and silver (the bimetallic ratio) dates from the first part of the 13th century, when the provincial law of Västergötland stipulated that the price for freeing a slave should be 2 öre in gold or 2 marks in silver.⁷⁵ Since 8 öre made 1 mark, this amounts to a gold:silver exchange rate of 1:8. However, there is no information as to whether or not this rate was used in actual transactions.

In large parts of Europe, between 1250 and 1330 the gold:silver ratio rose from about 1:9 to 1:15. After about 1330, the ratio in Continental Europe and England declined to between 1:10 and 1:11 at the time of the Black Death, reaching a minimum in the early 15th century. During the course of the 15th century, gold became more scarce, and the bimetallic ratio rose somewhat. In central and southern Europe it often fell to between 1:11 and 1:12 during the latter half of the 15th century.⁷⁶ There are, however, some areas where the relative price of silver was higher. In northern Germany, Hamburg often exhibits higher gold:silver ratios. During the latter

⁷⁴ Hildebrand (1894, vol. I:2, p. 910).

⁷⁵ Hildebrand (1894, vol. I:2, p. 948).

⁷⁶ Day (1978, pp. 34, 40), and Spufford (1986, pp. lxi, lxxiii).

half of the 15th century the average was about 1:12, fluctuating between 1:10 and 1:15.⁷⁷

Bimetallic ratios can be calculated for Sweden if the specie contents of mark penningar and foreign gold coins are known, as well as the exchange rates of these coins. For the period 1328–1534 we have found over 100 exchange rate quotations between various gold coins and Swedish mark penningar. Based on the value of florins (see Table A3.11), it appears that the bimetallic ratio in Sweden was remarkably high around 1330 (at 1:15 to 1:18) and went into a long-term decline thereafter.

For a long time, Swedish exchange rates were rather favourable for owners of foreign gold coins. Compared to most European bimetallic ratios, the amount of silver that had to be paid for minted gold in Sweden was high, at least up to the mid-15th century. This may reflect the confidence and status that were associated with the foreign coins, which for long periods held a constant weight of gold.

The value of gold coins could fluctuate significantly. Obviously, contemporaries did not always agree about exchange rates, which were set in a local context. High costs of information and transport may have contributed to a considerable disparity in exchange rates, which could also have been affected by variability in the age and specie content of the coins. The term ‘florin’, for example, does not necessarily refer to the original Florentine coin since florins were copied at many places in Europe, with varying specie content. Wear and tear of the individual coins was no doubt also taken into account in transactions.

This suggests a lack of monetary integration, which is not unexpected, given that the Hanseatic area was a rather backward economic zone compared to highly developed regions such as the Netherlands. A recent study reveals that money markets between Lübeck and Prussia were not well integrated in the 14th and 15th centuries.⁷⁸ Sweden could be expected to be a peripheral region of the Hanseatic area.

Gold always had to be imported to Sweden, pushing its price up. Little is known about how gold flowed into Sweden but international trade was clearly a major source. In 1369, for example, Edward III of England allowed a London burgher to send 200 pounds in gold or silver in order to buy herring in Scania (which was then part of Denmark).⁷⁹ Churches in Sweden were prominent buyers of expensive goblets and other gold objects, nearly all of which were melted down at the time of the Reformation around 1530, or even earlier. Much of the gold came from the Low Countries.⁸⁰

Bringing gold to Sweden, then, would normally require sea transport. A major risk associated with maritime transports was piracy. Pirates were a serious threat to trade in the Baltic area during several medieval periods. One example is Eric XIII (Erik of Pomerania), who turned to piracy after he was deposed as king of the Nordic

77 Volckart (2007, p. 51).

78 Volckart and Wolf (2006, pp. 123–4).

79 SDhk 9491.

80 Rasmusson (1962, pp. 177–81), and Källström (1939).

countries in 1439. Based on a fortress on the island of Gotland, he successfully raided many ships. In 1446, he lost a ship off the province of Småland carrying a valuable cargo of gold and silver, as well as other costly goods, that had been collected as taxes in Sweden. Baltic piracy was still a problem at the end of the Middle Ages.⁸¹

Transporting money, as well as other valuables, by land could also be rather risky. The papal emissaries to Sweden faced these dangers when they had to transport and protect the large sums of money they collected in the form of taxes and contributions. On one occasion in 1328, the emissaries sent a monk, escorted by twelve armed horsemen, to fetch a sizeable sum of money that had been deposited at the towns of Uppsala and Strängnäs. Despite his escort, he did not dare to take the money further than to the monastery of Riseberga in the province of Närke, about 80 kilometres from Strängnäs, where it was left on the advice of the bishop of Strängnäs. Later, the emissaries and the bishop sent an escort of 40 horses to collect the money that had been left at Riseberga. The treasure was further transported to the town of Lödöse on Sweden's west coast. During this journey, the risk of ambush made the emissaries drive their horses so hard that the animals were injured and had to be sold at a substantial loss on their arrival at Lödöse. From Lödöse, the money was shipped to the Netherlands.⁸²

The emissaries had every reason to be cautious. Some years earlier, in 1318, a sum of money collected by papal emissaries had been stolen from the cathedral of Växjö in the province of Småland when a band of robbers broke into the chests where the money was stored.⁸³ After a robbery in the province of Västergötland about a century later, a clergyman reported to the pope that the money collected had to be taken out of the country in secret.⁸⁴

The threat could come not only from robbers but also from the king himself. In about 1460, a papal emissary asked two monks to bring a sum of silver from Skara in Västergötland to the monastery of Julita in the province of Södermanland. The emissary instructed the monks to do this in secret and hide the silver in a bottle of beer; according to him, if the king learnt about the silver he would seize all of it.⁸⁵

Three silver mines seem to have been worked in medieval Sweden. Two of them were in the province of Dalecarlia (Dalarna). One was Väster Silvberg, a place name meaning 'western silver mountain' ('de monte argenti' in a Latin document from 1367); the earliest reference to it is from 1354. There were plans to establish a mint there in 1375, which may indicate a fairly substantial output of silver. However, this

81 *Vadstenadiariet* (1996, no. 564, p. 251). For a description of various periods of more or less intense piracy, see Hildebrand (1894, vol. I:2, pp. 605–15).

82 Brilioth (1915, pp. 157–159), and Fritz and Bäärnhielm (1990, no. 136d). See also Hildebrand (1879, vol. I:1, p. 36), for an example of robbery of money in the forests between the provinces of Östergötland and Småland in the late 14th century.

83 Brilioth (1915, p. 158).

84 Beckman (1954, p. 32).

85 SDhk 27528.

mine fell into disuse long before the end of the Middle Ages. The other Dalecarlian mine, Öster Silvberg ('eastern silver mountain'), was started in about 1480 and seems to have fallen into disuse around 1510, when a larger deposit was detected at Sala in the province of Västmanland.⁸⁶

The Crown was always eager to control silver mining. In 1489 the government stipulated that all the silver that was produced in the mines had to be sold to the master of the royal mint at the town of Västerås. The stated reason for this measure was that the amount of coin in the country should increase and not be taken abroad, as had been the case up to now. Even the goldsmiths were now obliged to buy their silver only from the master of the royal mint.⁸⁷

Silver spoons are often mentioned in late medieval documents, and have also been uncovered in archaeological investigations. They were an important form of savings, as well as status objects, for peasants as well as for townspeople. These spoons could also be used as a means of payment, as their weight appears to have been rather standardized.⁸⁸

Taking into account the supply of specie in Sweden, then, it is not surprising that gold was expensive relative to silver. Even so, the exchange rates on gold coins indicate a declining trend over time in the bimetallic ratio in Sweden.⁸⁹ Most of the few florin exchange rates available date from the years around 1330, whereas noble exchange rate quotations are most common in the period 1420–60. The Rhinish gulden occurs most frequently during the decades around 1500. There is a remarkable lack of data from about 1365 up to 1420. This could indicate that foreign gold coins played a minor role in the Swedish economy during this period, most of which was characterized by demographic decline in the wake of the Black Death. In 1363 one gold florin was valued 0.2 marks silver in Cologne weight, which would imply a gold:silver value ratio of roughly 1:12 to 1:13. The exchange rate on nobles (see Table A3.8) in the first half of the 15th century seems to imply a higher gold:silver ratio (at 1:12 to 1:14) than the average internationally. The exchange rates on the Rhinish gulden (Table A3.9) in the late 15th and early 16th centuries are more problematic since it is not clear whether the mark in Götaland referred to mark örtug or mark danska (equal to 0.75 marks örtug), but these rates do suggest a lower gold:silver ratio than in the first half of the 15th century.

How is the gradual improvement in the position of silver over gold to be explained? Although Swedish silver coins continued to be debased, over time each gram of silver in them tended to fetch increasing amounts of gold when exchanged against foreign coins.

86 Hildebrand (1894, vol. I:2, pp. 718 and 732), and Ekström (1948). Silver was probably not produced continuously at Silvberg. As late as 1511, however, the Crown purchased silver at Silvberg for minting purposes; SDhk 36922.

87 Hildebrand (1894, vol. I:2, pp. 732 and 916).

88 Franzén (1998, pp. 113–4), and Myrdal and Söderberg (1991, p. 95).

89 Information on the gold content of the coins is found in Volckart (2006).

It is possible that the supply of foreign gold coins in Sweden increased, which would have tended to alleviate the scarcity of gold. This cannot be determined with any certainty. We know, however, that gold possessions in the form of rings or Rhinish gulden are often recorded in the towns of Stockholm and Arboga during the latter part of the 15th century and the early 16th.⁹⁰

Another indication that gold became less scarce in Sweden is the frequency with which foreign gold coins are mentioned, compared to other coins, in medieval documents. The digital database *Svenskt Diplomatariums huvudkartotek* (SDhk), produced by the National Archive of Sweden, presently contains summaries of texts of about 41,000 charters from the medieval era. Table 3.1 summarizes some information on how often various types of coin are mentioned in this database (note, however, that the possibility that some evidence in the charters is missing in the database cannot be ruled out).

Table 3.1. *Number of documents (or summaries of documents) in which the most common foreign gold coins are mentioned compared to ‘mark’.*

Period	Total number of documents	Documents mentioning foreign gold coins	Documents mentioning ‘mark’	Foreign gold coins in per cent of ‘mark’
1340–1419	15,286	294	3,143	9
1420–99	15,103	376	1,859	20

Source: SDhk.

Note: The gold coins included are florins, nobles, and gulden.

Not all references to ‘mark’ denote the Swedish mark; they could also indicate Lübeck marks, Danish marks etc. The right-hand column of Table 3.1 thus informs us about the frequency with which the most common foreign gold coins (florins, nobles, and gulden) are mentioned compared to Swedish as well as other silver (or sometimes copper) coins. The role of foreign gold coins appears to have increased. They are mentioned more frequently in the period 1420–99 than during the preceding period 1340–1419, particularly compared to references to ‘mark’, which became less frequent. The greater availability of gold coins could to some extent explain why the bimetallic ratio in Sweden changed in the favour of silver during the late medieval period.

According to Table 3.1, the number of documents referring to ‘mark’ decreased over time. This should not be taken as an indication of de-monetization in the 15th century (although that possibility cannot be excluded, either). The smaller number of references to ‘mark’ may be due to the fact that in the SDhk database, many docu-

⁹⁰ Franzén (1998, pp. 107, 112), and Rasmusson (1962, p. 181).

ments after 1420 are available only as short summaries omitting details of payment, whereas documents prior to 1420 are often published in full.

3.7. Mark gutnisk and dansk during the 15th century

During the 15th century, different mark currency units were used concurrently in Sweden – mark gutnisk, mark jämtsk, mark svensk, mark stockholmsk, mark dansk, mark östgötsk, mark rigisk, mark stackota, etc. Moreover, Finland developed its own counting system. There is some confusion as to what exactly some of these terms denoted. Meanings often differed even within the same period. This situation reflects the fact that the monetary system was not fully unified, and that significant regional differences persisted, a kind of monetary refeudalisation. Partly due to the Kalmar Union, Danish and Gotlandic coins circulated widely in Götaland. It was not until the reign of Gustavus Vasa, and the end of the Kalmar Union, that the monetary systems of Götaland, Svealand and Finland were unified once more.

In the second half of the 14th and the early 15th centuries the Nordic countries and the Wendish towns de facto formed a monetary system, where attempts were made to fix the exchange rates between different coins.⁹¹ The Hanseatic towns started to mint a coin of higher denomination, named Witten, equal to 4 pfennings or 1/48 mark. In Sweden, the larger örtug coins were minted with the same weight (1.3 grams) and fineness as the German Witten. Since the örtug was equal to 1/24 mark örtug, this implies that one Swedish örtug was roughly equal in value to the Witten. The German Witten coin could also be referred to as German örtug.⁹² Denmark followed the Wendish towns and minted Witten coins of its own, called hvid. The relation: 1 Lübeck mark = 2 marks örtug is confirmed by written sources in 1349–75. In Götaland in the early 15th century, German, Danish and Gotlandic coins dominated the circulation.

A source from Småland in 1417 discusses a mark currency unit for which the following relation applied (1 mark = 8 öre):⁹³

$$1 \text{ öre} = 4 \text{ 'gutnyska'} = 4 \text{ 'ængliska'} = 3 \text{ 'hwyte pænnia'}$$

A similar relation is documented from other sources during the 1410s for the Götaland region.⁹⁴ The common application of the relation shows the dominance of for-

91 Lundholm (1956, pp. 211–5).

92 SDhk 17811.

93 SDhk 18918.

94 In Östergötland 1411 (Danmarks riges breve 310): 1 øre = 3 'hvide tyske penge' = 4 'gotlandske penge' = 4 'engelske'. In Småland 1412 (SDhk 17811): 1 'øre' = 3 'thydiska örtogher' = 4 'siælenske ængliske' = 4 'gotniske'. In Östergötland 1415 (SDhk 18646): 1 'øre' = 4 'ængliske' = 3 'thyske hwite' (the omission of Gotlandic coins shows that the öre referred to better coins in this case).



Lübeck in the late middle ages. In the second half of the 14th century the Nordic countries and the Wendish towns formed a monetary system with fixed exchange rates between various coins.

Source: http://en.wikipedia.org/wiki/File:Lubeka_kolorowa_litografia_ksi%C4%85%C5%BCKkowa_XIVw.jpg

eight coins in this region at the time. The ‘hwyte pænna’ (white penny) referred to the German (and to a lesser extent the Danish) Witten coin, with the nominal value of 4 penning or 1/48 of a Lübeck (or Danish) mark. The ‘ænglisk’ (engelsk) mostly referred to the Danish 3-penny coin, equal to 1/64 of a Danish mark or one English sterling. Thus the relation states that one mark örtug was equal in value to 32 gotar or gutniska, or to half a Lübeck or a Danish mark.

This relation was consistent with the fine silver contents of the various coins, although the German coins may have been undervalued. The Danish engelsk (sterling) minted in the late 14th and early 15th centuries had a fine silver content of 0.66 grams, implying that a Danish mark engelsk had the fine silver content of 42 grams (1 Danish mark engelsk = 16 skilling = 64 engelsk). In comparison, the fine silver content of 24 Swedish örtug, equal to one Swedish mark örtug, was 25 grams in the 14th century and 21 grams after 1405. The fine silver content of one mark gutnisk, equal to 32 gutar, was around 22 grams in 1340–1400, but was reduced significantly during the course of the 15th century. The fine silver content of the mark of Lübeck, equal to 48 Witten, was 50–55 grams in the late 14th century.⁹⁵ In 1401 it was reduced to 46 grams and in 1411 to 40 grams.⁹⁶ The relation 4 engelsk for 1 öre, half a Danish mark in engelsk for one Swedish mark, would be reasonable, given the silver contents of the Danish engelsk and the Swedish örtug.

Yrjö Hyötyniemi argues convincingly that the relation 1 mark = 8 öre = 32 gotar was not a part of the Gotlandic monetary system, but was initially the counting of one Swedish mark in Gotlandic coins. The gote was originally a Gotlandic örtug, where 1 mark was equal to 24 gotar, and one gote to 12 Gotlandic pennies. However, at times during the first half of the 14th century, Gotland adopted the mone-

⁹⁵ *KHL*, ‘engelsk’ and ‘hvid’, and Thordeman (1936, pp. 38 and 57).

⁹⁶ Nordström (1850, p. 129).

tary system of Lübeck, where 1 gote was set equal to 3 pennies of Lübeck. The Gotlandic mark was replaced by the silver mark of Gotland, which was equal to the mark of Lübeck, but counted in Gotlandic coins. One Gotlandic mark silver was initially set equal to 64 gotar or 768 Gotlandic pennies or $2\frac{2}{3}$ of the traditional Gotlandic mark. The counting of 1 mark = 32 gotar was only possible because 1 Swedish mark was fixed at $\frac{1}{2}$ mark of Lübeck. According to Hyötyniemi, the Gotlandic mark continued to exist as a local custom.⁹⁷ Hyötyniemi's hypothesis is supported by a source from 1343 stating that one Gotlandic silver mark was worth 30 groats of Flanders, which in the international markets was paid 0.9–1.1 marks of Lübeck (see Table A3.2).

By the late 14th century, the fixed relations between various Nordic and German coins could no longer be maintained. Other Danish coins were not as good as the sterling coins. For example, in 1386 the Danish mark was valued at only 0.625 marks of Lübeck and in 1406 at 0.75 marks of Lübeck. Although in 1405 the Gotlandic and Swedish marks were set equal in value, in 1389 1 Swedish mark was valued at 1.2 Gotlandic marks. In 1402, the Gotlandic silver mark was set equal to 32 öre, implying (given that the öre was equal to 3 gotar in accordance with the traditional Gotlandic system) that the gote was valued at only 2 pennies of Lübeck.⁹⁸ It was probably the old gotar with a higher fine silver content that was still valued at 6 penning (Swedish pennies) or 3 pennies of Lübeck in the early 15th century.

Around 1410, Gotlandic coins seem to have deteriorated significantly compared to the Swedish. When a differentiation occurred between the Swedish mark and the mark of 32 gutar, the latter was initially called 'tysk mark' (German mark), which according to Hyötyniemi shows the connection to the Hansaetic monetary system. It was not until the 1420s that this mark was labelled mark gutnisk, but according to Hyötyniemi this was not a Gotlandic but a mainland Swedish mark.⁹⁹ By 1413, 1 Swedish mark was valued at 1.5 tyska marks (see Table A3.2). By 1424, 1 mark of Lübeck was worth 4 marks gutnisk/tysk and 2 Danish marks.¹⁰⁰ Since the 1 mark örtug was worth 2 or more marks gutnisk/tysk, this implies that by the 1420s the Danish mark was of an equal or even lower value than the Swedish mark. In 1453, one Swedish öre was set equal to 8 'old' and 12 'new' Danish engelsk.

During the course of the 15th century, the fine silver content of the mark of Lübeck more than halved; it was reduced to 28 grams in 1424, to 25 grams in 1433 and to 20 grams in 1461.¹⁰¹ The mark örtug was quite stable throughout the 15th century, and was reduced only slightly, from 20–21 grams in the first half of the century to 17–19 grams in the second half. Table A3.4 also shows that the exchange

97 Hyötyniemi (1999).

98 Hyötyniemi (1999, p. 9).

99 Hyötyniemi (2000, p. 47).

100 Lundholm (1956, p. 212).

101 Forssell (1872, p. 39), and Lundholm (1956, p. 213).

rate of mark of Lübeck decreased from 2 marks örtug in the late 14th century to just 1 mark örtug in the second half of the 15th century.

During the course of the 1410s the debased Gotlandic coins drove out the better Swedish örtug as well as the Danish engelsk and German Witten coins from circulation in Götaland. The force of Gresham's Law is indicated by the Växjö Statute of 1414, which decreed that fines connected to honour, manslaughter and wounds must be paid in the better Swedish mainland coins, while all other transactions were to be made in Gotlandic coins of lower value.¹⁰² However, in Svealand the premium on örtug-coins relative to Gotlandic allowed them to dominate circulation. During the first half of the 15th century a split occurred between counting in mark gutnisk in Götaland and in mark örtug in Svealand. During the second half of the century, when Gotland introduced the Danish monetary system, there was a gradual shift towards counting in mark danska, although this unit came to be linked to the Stockholm mark. In the first half of the 16th century, mark gutnisk and mark danska first became pure units of account of Swedish coins, and then disappeared as such.

During the uprisings in Sweden and Norway, Eric XIII fled to Gotland in 1436 and ruled the island up to 1449, when Denmark regained control. During his reign in Gotland, the fine silver content of the mark gutnisk was reduced significantly, to between 2.2 and 6.5 grams,¹⁰³ which was between 1/10 and 1/3 of the mark in Swedish örtugs.¹⁰⁴ This is clearly visible in the exchange rates of mark gutnisk in Table A3.2. While one mark örtug was worth around 2 mark gutnisk in the period 1420–34, it increased to 4 or more in the 1440s.

Although the relation 1 öre gutnisk = 4 gotar is the best known, the relation 1 öre = 3 gotar can also be documented for the 1440s and 1450s. According to Paul Sjögren, mark stackota was the same as mark gutnisk, and öre stackota the same as öre gutnisk.¹⁰⁵ Dovring and Hyötyniemi argue against this, claiming that 1 mark stackota = 0.75 marks gutnisk.¹⁰⁶ According to Hyötyniemi, the mark stackota was the traditional Gotlandic mark, equal to 24 Gotlandic örtug, and mark östgötsk and mark västgötsk were only other names for this currency unit, while mark kalmarsk was the same as mark gutnisk. According to Dovring, the difference between the two marks would explain why the öre östgötsk was equal to 3 gotar, while one öre gutnisk was equal to 4 gotar. The problem with Dovring's and Hyötyniemi's argument is that there are also sources which confirm that 1 öre gutnisk was set equal to 3 gutar.¹⁰⁷ Hildebrand shows that one source uses mark stackota and mark gunniska as

102 Hallenberg (1798, p. 13).

103 Thordeman (1936, p. 57).

104 The debasement could have been implemented some years before Eric came to Gotland. See Hyötyniemi (2002).

105 Sjögren (1944, p. 349).

106 Dovring (1947, pp. 195–7), and Hyötyniemi (2000, pp. 47–9).

107 SDhk 24756 (year 1445) and 26053 (year 1452).



Valdemar Atterdag Holding Visby to Ransom, 1361, signed in 1882 by Carl Gustaf Hellqvist (1851–90), a Swedish history painter. The Danish king Valdemar IV (Valdemar Atterdag) is depicted collecting taxes from the inhabitants of Visby on the island of Gotland in 1361. The townspeople were required to fill three large barrels with gold, silver and other valuables. Gotland had previously been part of the Swedish kingdom; the island suffered an economic decline in the late Middle Ages, probably due to long-term structural factors rather than to the Danish invasion. Some details in the painting are incorrect. For example, the man on the right appears to be Jewish, but there were no Jews at that time in Visby. The dachshund is another anachronism since the first dachshunds were bred in the 16th century. Source: Nationalmuseum.

synonyms.¹⁰⁸ If there was a difference between the mark of 32 gotar and the mark stackota of 24 gotar, where the latter was worth $\frac{3}{4}$ of the former, it is clear that mark gutnisk was used as a term for both.

Another possibility for the counting in 3 and 4 gutar per öre gutnisk is that gutar of different values circulated so that the better-valued gutar appreciated. Hyötyniemi shows that better coins were minted towards the end of Eric XIII's rule in Gotland, 1444–8.¹⁰⁹ After this period the gote is commonly referred to as 'grossus'. In the Swedish mint regulation of 1453, one örtug was set equal to 8 'old and new' gotniska or 4 grossa,¹¹⁰ the last probably referring to a Gotlandic coin as well. This implies that the grossa was valued at twice as much as the gotniska. Counting 4 gotniska to one öre

¹⁰⁸ Hildebrand (1894, vol. I:2, p. 942).

¹⁰⁹ Hyötyniemi (2002).

¹¹⁰ Liedgren (1967, p. 15).

gutnisk, it would imply that one mark örtug would be set equal to 6 mark gutniska in the lower-valued coins. Although such a low exchange rate for the mark gutnisk is not known from other sources, it is possible that the mint regulation attempted to set a value below the actual market rate. Counting 3 grossa to one öre gutnisk, it would imply that one mark gutnisk would be set equal to $\frac{1}{4}$ mark örtug, which during the second half of the 15th century in Götaland developed into a unit of account also for Swedish coins.

From the mid-15th to the mid-16th centuries, Götaland used mark danska as a unit of account, which gradually replaced mark gutnisk. In 1453, the official value of the Danish hvid was set to 3 Swedish penning. Since one Danish mark was 16 skilling or 48 hvid, one mark danska was equal to 144 Swedish penning, i.e. one mark danska was set to 6 Swedish öre or $\frac{3}{4}$ mark örtug. Later this became an account identity linked to the Swedish money, not to actual Danish coins. Both systems could be used in the same transaction. Accounts were sometimes specified in mark örtug, but the total sum could be written in mark danska, without indicating that mark örtug was converted into mark danska.¹¹¹ To make matters even more confusing, the term ‘mark svensk’ could have two different meanings, either mark örtug (mostly in Svealand) or mark dansk in Swedish coins (mostly in Götaland).¹¹² The term ‘mark stockholmsk’ was also commonly used instead of mark örtug.

Hallenberg shows that mark gutnisk was a unit of account in the 1530s, equal to $\frac{1}{3}$ mark danska or $\frac{1}{4}$ mark örtug, and no longer referred to actual Gotlandic coins. It is not entirely clear whether such a unit of account already existed in the 15th century. Although the relation 1 svensk mark = 3 mark gutnisk was quite common in the second half of the 15th century, the mark svensk probably referred to the mark dansk, which was equal to $\frac{3}{4}$ of the mark örtug.¹¹³

During the 1540s, counting in mark danska and gutniska was gradually replaced by the Swedish system. During this transitional period the terms ‘skillingar svenska penningar’ (shillings Swedish pennies) and ‘mark danska i svenskt mynt’ (Danish marks in Swedish coins) were common. Here, there was no Swedish skilling, neither was the payment made in Danish skilling (i.e. one ‘skilling svenska pengar’ was not necessarily equal to one skilling in actual Danish coins). It was purely an accounting system based on Swedish coins. For example, in 1545 one mark in Danish coins was exchanged for $1\frac{2}{3}$ marks danska in Swedish coins, which in turn was equal to $1\frac{1}{4}$ marks örtug.¹¹⁴

Majvor Östergren and Kenneth Jonsson (1998) point out that although a transformation into a Danish monetary system is considered to have taken place in Gotland after the mid-15th century, where the gote was replaced by the hvid (= 4 penning = $\frac{1}{16}$ skilling = $\frac{1}{48}$ mark), the old gutar continued to dominate the circulation of

111 Hallenberg (1798, pp. 84 and 155).

112 Hallenberg (1798, pp. 35–6).

113 Dovring (1947, pp. 195–6).

114 Hallenberg (1798, pp. 169 and 302–7).

the island during the second half of the 15th century. One reason for this was probably that the minted amount of hvids was quite small in relation to the gutar minted before the mid-15th century. Table A3.2 shows that one mark lödig was, with a few exceptions, valued consistently at 30–40 marks gutnisk in the whole period 1445–1513. When the exchange rate of 1.4 mark gutniska for 1 mark örtug is mentioned in 1480, the coins are referred to as ‘gutniska vita’,¹¹⁵ while in the 1430s and 1440s the term ‘svarta gutniska’ was used.¹¹⁶

The fine silver content of the Gotlandic mark in hvids (1 mark = 48 hvids) deteriorated, from 9.5–11 grams in 1455–80, to 5.5–5.9 grams in 1480–1500, 5–6.1 grams in 1510 and 4.9 grams around 1530.¹¹⁷ The fine silver content in 1480–1510 would roughly entail an exchange rate of 30–35 marks gutniska for one mark silver. This corresponds quite well to the estimated exchange rate for 1513 in Table A3.2, where one mark gutnisk is probably valued at 2–2.5 marks örtug, which shows that mark gutnisk in 1513 most likely referred to Gotlandic hvids minted in 1480–1510. The example from 1513 shows that, in Götaland, mark gutnisk could still refer to actual Gotlandic coins.

Hence it is clear that especially after the mid-15th century, but possibly also earlier, the term ‘mark gutnisk’ referred to different types of currency. Exactly how the term mark gutnisk was used in the 15th century, and whether it differed from the term mark stackota, still calls for further research.

3.8. Mark rigisk and revalsk

During the Middle Ages, the Livonian currency (mark of Riga and Reval) was strongly integrated with the Nordic and Hanseatic monetary system. As early as in 1211, Riga decided to mint its currency at the same exchange rate with the mark silver as in Gotland.¹¹⁸ In Finland, which had been conquered by Sweden, artig coins of Riga and Reval were more common than Swedish coins during the 15th century, and were called revalsk or räflisk [örtug].

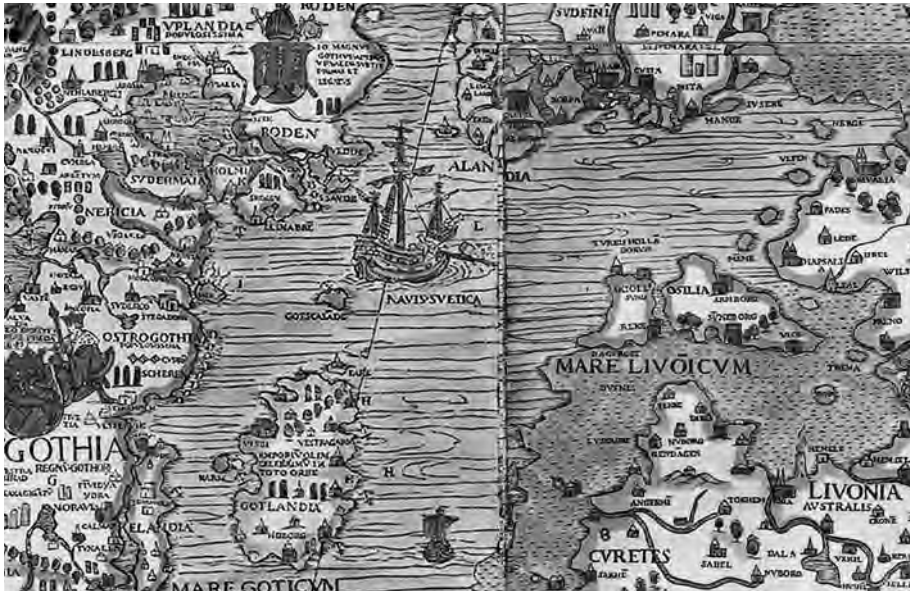
The fixed relation between mark rigisk and mark gutnisk was broken in the early 14th century. While 1 mark silver was worth 7 marks gutniska in 1312, it was worth 6 marks rigiska in 1315–16 (see Table A3.2 and Table A3.5). Hyötyniemi argues that it was in this period that 1 mark silver of Riga was set equal to 6 old marks rigisk or 144 artig of Riga (since 1 old mark rigisk = 24 artig). The counting in this silver mark, also called mark rigisk, continued even though the silver content of the artig deteriorated. In 1343, the Livonian artig was minted at the same value as the Gotlandic örtug (gote), which in turn had the same value as 3 pennies or 1/4 schilling of

115 Dovring (1947, p. 197).

116 See, for example, SDhk 23731, Dovring (1947, p. 197), and Hallenberg (1798, p. 17).

117 *KHL*, ‘hvid’.

118 Myrberg (2008, p. 88).



Parts of the Baltic Sea according to *Carta Marina*, created by Olaus Magnus (1490–1557). The coins of Gotland ('Gotlandia', lower left), were also used in Götaland ('Gothia'). Riga (capital of present-day Latvia) in Livonia, lower right, minted coins according to the standard of Gotland in the 13th century. In Åbo in Finland (to the right of 'Alandia'), coins of Riga and 'Rivalia' (present-day Tallinn in Estonia), visible to the right, were circulating in the 15th century. The currency of the Swedish realm was sometimes denominated as 'mark stockholmsk' or 'mark holmsk'. 'Holmia', upper left, is present-day Stockholm.

Lübeck.¹¹⁹ The mark silver of Riga was, therefore, at par with 36 schilling or $2\frac{1}{4}$ marks of Lübeck, implying that 1 artig of Riga or revalsk was at par with 6 Swedish pennies (penningar) in the second half of the 14th century.

During the 15th century Finland counted the Swedish mark in coins of Livonia. Since the Livonian coins that circulated in Finland were of a different fine silver content, the artig coins were valued differently, mostly varying from 4 to 6 Swedish pennies (see Table A3.5). For example, in 1414, 5 revalska was set equal to 23 penning ($23/24$ öre) of the Åbo mark. The Åbo mark was not a variant of mark rigisk, but the Swedish mark counted in coins of Riga (however, örtug coins were also minted at Åbo¹²⁰). Similarly, in Viborg one öre was set equal to 4 revalsk in 1415. Since there was no fixed relation between öre and revalsk, no separate mark currency unit developed at that time in Finland comparable to the mark gutnisk in Götaland.

¹¹⁹ Hyötyniemi (1999).

¹²⁰ Thordeman (1936, p. 39).

In the 1420s a third mark *rigisk* came in use, which was set equal to 36 old *artig* (new *schilling*) or *revalska* (i.e. 1 mark silver of Riga = 4 new marks of Riga), which put the mark *rigisk* roughly equal to the mark *örtug*.

As late as the 1530s and 1540s the mark *rigisk* was used as a counting unit in Finland, where 1 mark *rigisk* = 9 Swedish *öre*. The Swedish mark was counted as 32 *skilling* of Riga, while 1 mark of Riga was equal to 36 *skilling*.¹²¹

3.9. Mark *jämtsk* and *hårdalsk*

Jämtland and Härjedalen belonged to Norway in the Middle Ages but had close contacts with Sweden (for example, Jämtland was then part of the episcopate of Uppsala). The term ‘mark *jämtsk*’ is documented earliest in 1346 and was used at least up to the early 16th century.¹²² The same source often mentions both mark *jämtsk* and mark *svensk*, which shows that two different currency units were used. The term ‘mark *hårdalska*’ is also mentioned, although it is not clear whether it was the same as the mark *jämtsk*.¹²³ Neither Jämtland nor Härjedalen minted their own coins.

The only known exchange rate is from 1437, when 1 mark *jämtsk* = 1 13/35 (\approx 1.37) Swedish marks, i.e. 1 mark silver \approx 6 marks *jämtsk* at the time.¹²⁴

How the term mark *jämtsk* came to be used is not clear, but it could have to do with the monetary union between Sweden and Norway in the 1340s and 1350s. In 1340 Norway started to mint coins with the value of 5 marks *penningar* to one mark silver, instead of 4 marks *penningar* hitherto. This was an adjustment to the Swedish mark *penningar*.¹²⁵ It is possible that the mark *jämtsk* was based on the Norwegian currency from the 14th century (or the better currencies of Denmark in the early 15th century). Norway stopped minting its own coins after the late 14th century. In the second half of that century the mark *lödig* was worth 6 Norwegian marks, which is the same rate as for mark *jämtsk* in 1437. However, no definite conclusions should be drawn.

3.10. Parallel *örtug* units

The continual reduction of the fine silver content of coins implied that coins of the same nominal value could contain different amounts of silver. While the older, better coins often tended to be withdrawn from circulation (in accordance with Gresham’s Law), they were often at a premium relative to inferior coins, which allowed them to stay in circulation. This happened with the older *örtug* coins in the late 15th

121 Hallenberg (1798, p. 233).

122 SDhk 5259 and 36939.

123 Ahnlund (1948, pp. 484–486).

124 *KHL*, ‘mark’.

125 Rasmusson (1943, p. 269).

century, after the fine silver content of the new örtug coins was reduced from 1478 onwards.

The örtug minted before 1478 was called ‘gammal örtug’ (old örtug) and its successor was called ‘ny örtug’ (new örtug). In 1481, 1 gammal örtug = 9 penning = 1.125 new örtug, while the nominal value of the örtug was supposed to be equal to 8 penning.¹²⁶ In 1493–1509, 1 gammal örtug stood at 10 penning, in the early 1510s at 12 penning and in the late 1510s at 16–18 penning.¹²⁷

Thordeman points out that gammal örtug functioned as a stable currency unit in this period, similarly to the role of the daler/riksdaler after 1534.¹²⁸ Although Rhinish gulden and mark lödig also functioned as stable units during monetary instability, gammal örtug could be more convenient to use since it was of a lower value.

In 1523, the fine silver content of öre was reduced. Thereafter one minted örtug was equal to ½ öre, i.e. 12 penning. The minted örtug was later called ‘halvöre’ (half öre). After 1523, one gammal örtug was equal to ¾ öre (i.e. 18 penning according to the highest exchange rate, reached in the late 1510s). From the late 1520s onwards, gammal örtug became a unit of account equal to ¾ öre, and no longer referred to the old örtug-coins minted before 1478.¹²⁹

In 1589–90 a gammal örtug was minted with the value of ¾ öre (in proper coins). This was the last time örtug coins were minted in Sweden. The coin contained 0.27 grams fine silver, which was less than a third of the örtug minted before 1478.¹³⁰

The örtug continued to exist during the 16th century as a unit of account, when one mark = 24 örtug, which became different from the minted örtug. Furthermore, one mark dansk was also divisible into 24 örtug, and the örtug units of Götaland and Svealand differed in value. Hence, before 1550 one öre was equal to 3 örtug in Svealand but to 4 örtug in Götaland.¹³¹

3.11. The debasement cycle in the first quarter of the 16th century

During the first two decades of the 16th century, a substantial debasement of the circulated coins led to inflation. This reached a high in the early 1520s, when ‘klipping’ coins were brought into circulation.

The exchange ratio of mark lödig to mark penningar rose from 1:10 in 1499 to 1:13 in the first decade of the 16th century and to 1:16 in the late 1510s. In a letter dated 1510 to the Archbishop, the Swedish Regent Svante Nilsson complained about the monetary disturbances. He proposed that the nominal value of the old örtug

126 Sandbergska samlingen, O:1, f. 63, RA.

127 Forssell (1982, pp. 22–5).

128 Thordeman (1936, p. 51).

129 Hallenberg (1798, pp. 189–99).

130 Lagerqvist and Nathorst-Böös (1968, p. 146), and Wallroth (1918, pp. 44–7).

131 Hallenberg (1798, pp. 175 and 189–99).



The Entry of King Gustav Vasa of Sweden into Stockholm, 1523, painted in 1908 by Carl Larsson (1853–1919), representative of the Arts and Crafts Movement. The minting of large amounts of debased *klipping* coins, to finance the war against the Danish king, caused substantial inflation in 1523.

Source: Nationalmuseum.

(minted before 1478, see above) would be increased from 10 to 12 penning, the new örtug from 8 to 10 penning, and fyrkar (half-örtug) from 4 to 5 penning. In this way the better coins would not be driven out of circulation and exported, as had occurred hitherto (in accordance with Gresham's Law).¹³² Figure 3.2 also shows that there was a negative seignorage on (the heavier) silver coins at this time.

The örtug coins minted in the early 16th century had a fine silver content that was only slightly lower than that of the coins minted in the late 15th century. What caused the monetary disarray was the minting of coins of lower denominations which contained significantly less fine silver per mark than the örtug coins. After 1512 the minting of örtug coins ceased for the rest of the decade.¹³³

In 1521–3 Gustavus Vasa led a rebellion against the Danish King Christian II, who also ruled over the Swedish territories. Both Christian II and Gustavus Vasa minted *klipping* coins with a very low silver content compared to their face value,

¹³² SDhk 36678. See also Hammarström (1956, p. 130).

¹³³ Thordeman (1936, p. 90), Malmer (1980, p. 43), and Wallroth (1918).

which led to price increases when goods were paid for in clipping coins.¹³⁴ The clipping coins of Christian II were not minted in Sweden, but were imported in huge volumes. The face value of the clipping coin minted by Gustavus Vasa was 18 penning (the contemporary market value of the gammal örtug). While the rate between mark lödig and mark penningar was 1:16 in 1514–20, the market rate between mark lödig and mark klippingar was according to one source as high as 1:50.¹³⁵

Lagerqvist and Nathorst-Böös write that today the clipping of Gustavus Vasa is very rare compared to the clipping of Christian II. One theory is that Gustavus Vasa simply replicated the clipping of Christian II on a large scale, and in this way could blame him for the problems with inferior coins.¹³⁶

At a meeting in Vadstena on 1st January 1524 it was decided that the clipping coin would be devalued by 1/3, i.e. to 12 penning. Shortly afterwards the clipping coins were demonetised. There are indications that already in April 1524 the clipping coins were only worth their metal content.¹³⁷ Another problem arose briefly when the Danish klippings were decreed to be invalid in Denmark but continued to be valid as means of payment in Sweden, which caused an inflow of Danish klippings to Sweden¹³⁸ (later the latter were also decreed to be invalid¹³⁹). The rate between mark lödig and mark penningar stabilised at 1:16 to 1:20 in 1523–35.

3.12. Seignorage

As long as the face value of a coin exceeded the cost of producing it, the ruler made a profit, commonly labelled *seignorage*. Too little is known about the cost of producing silver coins to establish any tendencies over time. Gross seignorage includes these costs of production.¹⁴⁰ Furthermore, information on the actual mint price is very scarce. Another mode of calculation consists in relating the market value of the mark penning, expressed as the exchange rate against the silver mark, to the metallic silver content of the coins representing one mark.

An example may clarify the procedure. Information on the specie content of the

¹³⁴ The term 'klipping' was used because the coins were clipped directly in a square shape to save time. Clipping coins were minted on several occasions during the 16th and 17th centuries.

¹³⁵ 'Myntz och Sölfwers Werdering', Riksarkivets ämnessamlingar, Misc. 26 Myntväsen, vol. 4. The fine silver content of one clipping coin with the nominal value of 18 penning was, according to Wallroth (1918, p. 14), 0.4456 grams and 0.382 grams, respectively. According to Thorde- man (1936, p. 51), in reality, many clipping coins probably had a lower silver content. See also *KHL*, 'klipping'.

¹³⁶ Lagerqvist and Nathorst-Böös (1968, pp. 130–1).

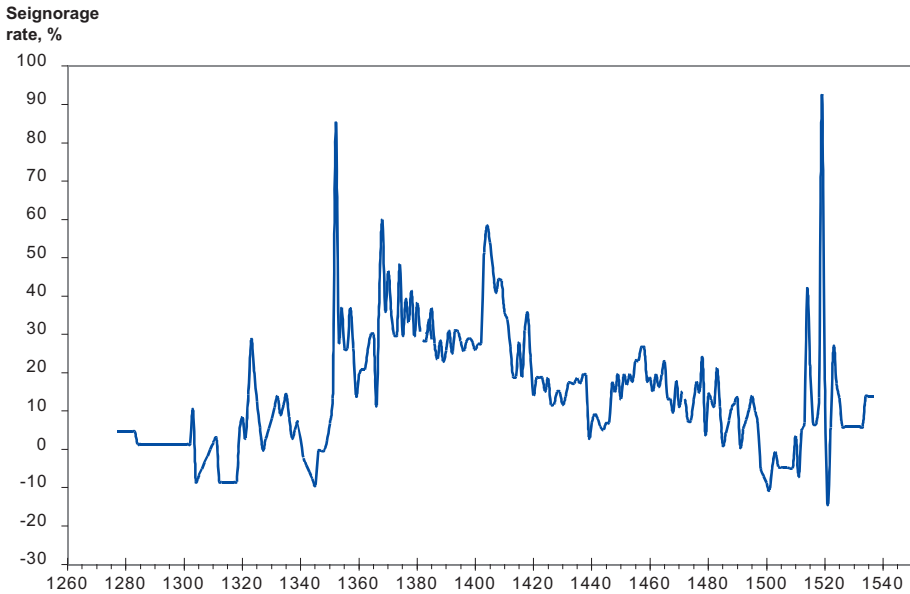
¹³⁷ *KHL*, 'klipping'.

¹³⁸ Hallenberg (1798, pp. 88–9).

¹³⁹ In the latter part of the 1520s, 4 marks in Danish clipping coins were worth 1 Swedish mark in new coins. See *Stockholms stads tänkebok 1524–29* (1929–40, p. 245).

¹⁴⁰ Redish (2000, p. 27).

Figure 3.2. *The gross seignorage rate (in per cent) 1277–1539 based on the market value of mark silver in mark penningar and the fine silver content of the coins representing one mark.*



Sources: Table A3.1, Malmer (1980), Thordeman (1936) and Wallroth (1918).

coins is based on numismatic studies.¹⁴¹ In 1425, for instance, the measured silver weight of mark penningar was 20.7 grams. The market value of mark penningar in grams of silver, on the other hand, is the ratio between the fine silver content of the mark lödig (194 grams in 1425 according to Table A3.1) and the market rate of exchange between the silver mark and the mark penning (in 1425 it took 8 mark penningar to buy one silver mark, so the rate was 8). The value of the mark penningar in grams of silver was then $194/8 = 24.2$ grams.

The gross seignorage can now be calculated as the market value of mark penningar (24.2 grams) less the metallic silver content of the coins representing one mark (20.7 grams). The market value of the minted coin thus exceeded its specie content. This is expected, given the cost of minting and the ruler's profit on minting. Disregarding the cost of minting, it would have paid to buy silver marks at the going exchange rate and strike them into new coins – but minting was the sole and carefully guarded privilege of the regent. In this case, the excess amount of silver was 3.5

¹⁴¹ Thordeman (1936), and Malmer (1980). Malmer's estimated silver weights, combined with her assumptions regarding wear and tear, tend to give unrealistically high silver values of the penning.

grams (24.2 less 20.7 grams). The gross seignorage rate is estimated as the ratio of gross seignorage to the metallic silver content of the coins representing one mark, in our example $(24.2 \text{ less } 20.7)/20.7 = 17$ per cent.

Figure 3.2 shows that our measure of the seignorage rate fluctuated in the period 1277–1350. Initially the gross seignorage rate was close to zero per cent, i.e. coins circulated in accordance with their fine silver content. There were times when gross seignorage was negative, which is counter-intuitive and implies that the ruler minted coin with too high a silver content, or rather that the market did not appraise the coin at its full specie content. The results for this period should be regarded with scepticism until further numismatic studies have been carried out.

After the mid-14th century the curve looks quite different. The inflation coins of the 1350s and 1360s temporarily increased the seignorage rate. As mentioned above, in the early 1360s King Albert, coming from Mecklenburg in Germany, introduced a new type of coin, the Witten, later called the örtug (1 örtug = 8 penning or 1/3 öre). Coins of this type were in general use in the Hanseatic towns of northern Germany. Although Albert's reign was characterized by war and civil conflict in Sweden, there was remarkable monetary stability as measured by the exchange rate between mark silver and mark penning, which for several years stood at 1:6.¹⁴² The high level of seignorage during this period suggests that, besides being profitable for the ruler, the introduction of new and better coins was appreciated by the people. Conversely, the inferior coin introduced in the early 15th century by King Erik of Pomerania during a period of financial disorder quickly resulted in a deteriorating seignorage rate.

With the exception of a few years around 1500, our measure of the seignorage rate is always positive after the mid-1360s, which seems reasonable. The broad trend over time is that the seignorage rate decreased during the late Middle Ages, up to about 1500. This could be due to several factors. First, people may successively have learnt more about the true specie content of the coins and become more aware of the ongoing debasement. Second, the long demographic decline after the Black Death, continuing well into the 15th century, should have served to reduce demand for money.

At the same time, what was perceived as a general scarcity of silver and silver coin probably tended to counteract the long-term decline in the seignorage rate. In 1453, King Karl Knutsson complained of a shortage of domestic currency in the country, leading to the use of bad foreign coin. He mentioned in particular the Gotlandic [gutnisk] coin, which was used to buy Swedish coin. Thus, according to the King, the small amount that was minted in Stockholm was taken away and melted down. The King aimed to expand domestic minting, but these plans were only partly realized.¹⁴³

¹⁴² Hildebrand (1894, vol. I:2, pp. 831–6).

¹⁴³ Liedgren (1967, p. 14), and Hildebrand (1894, vol. I:2, p. 850).

Sometimes the rulers were active in taking specie out of the country. King Christian I reportedly took large sums of silver and gold (in the form of English nobles) with him when he left the country in 1461, in order to pay for his purchase of Holstein.¹⁴⁴ In the 1520s, King Gustavus Vasa arranged for large amounts of silver, much of it confiscated from churches and monasteries, to be shipped to Lübeck in order to pay his war debt.¹⁴⁵

The scarcity of silver continued throughout the medieval era. Exports of silver and coin were prohibited by the Government in 1474 and again by the Chancellor in 1486, arguing that the domestic coin must be improved.¹⁴⁶ The melting down of domestic coin was banned in 1478, and at the same time restrictions were placed on bringing Danish coin into Sweden.¹⁴⁷ Yet the problem remained. This is indicated by the fact that the ban on silver exports was repeated in 1493, 1498, and 1499.¹⁴⁸ As mentioned above, in 1510 the ruler, Svante Nilsson, observed that silver coin was being taken out of the country.¹⁴⁹ Figure 3.2 also shows that the gross seignorage rate was significantly negative at the time. A negative profit from minting implies that there is a positive profit on turning coins into bullion. Gresham's law seems to have been at work, according to which debased coin will replace coin with a higher specie content. Despite the fact that mark penningar were successively debased, it was apparently still profitable to take these coins out of the country to have them melted down.

Great hopes were placed on increasing output from the silver mine at Sala in the province of Västmanland, which was started in about 1509. However, there is no record of a substantial increase in silver production at Sala until about 1530.¹⁵⁰

There were other ways by which the ruler could profit from minting, apart from the fact that the market value of mark penningar usually exceeded the metallic silver content. A 1497 contract between King Hans and the master of the Mint stipulated that the King would receive one gulden for each gold mark and 0.5 marks for each Cologne mark in silver (worth 10/9 of the Swedish mark) that was minted. The master of the Mint was also obliged to mint 20 gold marks and 20 silver marks for the King every year. The King agreed to deliver the necessary gold and silver and to pay for the metal that was lost in the melting process; otherwise the mint master was not to be paid for making these coins.¹⁵¹

The reign of Gustavus Vasa was characterized by a strengthening of both central state power and the monarch's personal power. One consequence of this probably

144 *Vadstenadiariet* (1996, no. 719, pp. 302–4).

145 Källström (1939, pp. 30 and 76), and Hammarström (1956, pp. 407–9).

146 1474: Hildebrand (1894, vol. I:2, p. 917. The 1486 prohibition: *Stockholms stads tänkeböcker 1483–1492* (p. 133).

147 Liedgren (1967, p. 16).

148 Hildebrand (1894, vol. I:2, pp. 917–918), and SDhk 33742 (April 3, 1499).

149 SDhk 36678 (Västerås 16 February, 1510).

150 Hammarström (1956, pp. 276 and 305).

151 Hildebrand (1894, vol. I:2, p. 925).

was that minting became more profitable for the King. When the King purchased silver for the mint in the beginning of 1529, he paid 16 marks for one silver mark in the mining district; he complained at that time that silver had become so expensive that he had no 'profit' from it anymore. He made an agreement with the silver miners that the price would be reduced to 12 marks by August, 1529.¹⁵² At this time one mark of pure silver was minted into 24 marks penning. This was also the case in the following year, 1530, when we have some information as to the remuneration of the mint master. According to the contract with the King, the mint master would strike one mark of pure silver into 24 marks penningar and the King would receive 19.375 marks.¹⁵³ The mint master was to keep the difference, 4.625 marks, as his payment, which was also meant to cover the cost of minting. The King of course had to pay for transports and other costs.

As long as these prices applied, minting should have given the King a handsome profit. Even though the seignorage in Figure 3.2 appears to be modest in the late 1520s, this example reminds us that there were other ways in which the King could profit from minting. This profit probably increased further in the 1530s. In 1536, for instance, the Crown raised the taxes on silver production and in reality paid only 5 marks penningar for each silver mark delivered from the Salberget mine. At the same time, 22 marks were minted from each silver mark.¹⁵⁴ The beginning of the early modern era in Sweden thus produced a very handsome seignorage to the ruler.

3.13. Concluding remarks

The medieval system of payments in Sweden, as described above, was complex. The foregoing discussion has aimed to clarify some essential features in a way that may facilitate further study of medieval Swedish economic history by international researchers. For instance, the presentation of the exchange rate between the silver mark and mark penningar provides information that is indispensable to anyone who wishes to convert nominal Swedish prices into silver prices, which in turn is necessary for international comparisons. The exchange rate series in Table A3.1, based on around 800 observations, is arguably one of the longest and most reliable economic series that can be produced for the Swedish medieval era.

Part of the complexity of the monetary system is due to the lack of a country-wide monetary standard for most of the medieval era. Several currencies existed alongside mark penning. The exchange rates between these various currencies and mark penning (or the silver mark) are sometimes not known at all. In addition, various foreign gold coins circulated at a floating rate. Still, we have tried to summarize the available information in several tables. Using these, it should be possible to use many nominal price quotations expressed in currencies other than mark penning.

152 Hildebrand (1894, vol. I:2, p. 917).

153 Forssell (1872, p. 54).

154 Hammarström (1956, p. 312).

One of the most promising roads for future research into economic conditions in medieval Sweden is the use of modern database technology. A particularly valuable resource is the ongoing construction of *Svenskt Diplomatariums huvudkartotek över medeltidsbrev* (SDhk). This publicly available database provides almost endless possibilities of studying many economic (as well as non-economic) phenomena over time and space. As this database expands to include more complete documents, especially from the period after 1420, an increasingly powerful tool will be available to researchers.

Appendix A3: Summary tables

Table A3.1. Exchange rate of mark silver/lödig in mark penningar/lörtug 1277–1541.

Year	Fineness of silver mark, assumption	Fine silver content of silver mark, grams	Exchange rate, likely mean	Exchange rate, likely median	Exchange rate, lowest recorded	Exchange rate, highest recorded	Fine silver content of mark in grams, based on exchange rate
1277	0.938	197	3.78	3.78	3.00	4.56	52.2
1278	0.938	197	3.78	3.78	3.00	4.56	52.2
1279	0.938	197	3.78	3.78	3.00	4.56	52.2
1280	0.938	197	3.78	3.78	3.00	4.56	52.2
1281	0.938	197	3.78	3.78	3.00	4.56	52.2
1282	0.938	197	3.78	3.78	3.00	4.56	52.2
1283	0.938	197	3.78	3.78	3.00	4.56	52.2
1284	0.938	197	3.90	3.90			50.6
1285	0.938	197	3.90	3.90			50.6
1286	0.938	197	3.90	3.90			50.6
1287	0.938	197	3.90	3.90			50.6
1288	0.938	197	3.90	3.90			50.6
1289	0.938	197	3.90	3.90	3.00	3.00	50.6
1290	0.938	197	3.90	3.90			50.6
1291	0.938	197	3.90	3.90	3.00	4.80*	50.6
1292	0.938	197	3.90	3.90			50.6
1293	0.938	197	3.90	3.90			50.6
1294	0.938	197	3.90	3.90			50.6
1295	0.938	197	3.90	3.90			50.6
1296	0.938	197	3.90	3.90			50.6
1297	0.938	197	3.90	3.90			50.6
1298	0.938	197	3.90	3.90	3.00	3.00	50.6
1299	0.938	197	3.90	3.90			50.6
1300	0.938	197	3.90	3.90			50.6

Table A3.1 (cont.). Exchange rate of mark silver/lödlig in mark penningar/lörtug 1277–1541.

Year	Fineness of silver mark, assumption	Fine silver content of silver mark, grams	Exchange rate, likely mean	Exchange rate, likely median	Exchange rate, lowest recorded	Exchange rate, highest recorded	Fine silver content of mark in grams, based on exchange rate
1301	0.938	197	3.90	3.90			50.6
1302	0.938	197	3.90	3.90			50.6
1303	0.938	197	4.15	4.15	3.88	4.42	47.6
1304	0.938	197	5.00	5.00	5.00	5.00	39.5
1305	0.938	197	4.91	4.91			40.2
1306	0.938	197	4.83	4.83			40.9
1307	0.938	197	4.74	4.74			41.6
1308	0.938	197	4.66	4.66			42.4
1309	0.938	197	4.58	4.58			43.1
1310	0.938	197	4.50	4.50	4.50	4.50	43.9
1311	0.938	197	4.45	4.45	3.89	5.00	44.4
1312	0.938	197	5.00	5.00	5.00	5.00	39.5
1313	0.938	197	5.00	5.00			39.5
1314	0.938	197	5.00	5.00			39.5
1315	0.938	197	5.00	5.00			39.5
1316	0.938	197	5.00	5.00			39.5
1317	0.938	197	5.00	5.00	5.00	5.00	39.5
1318	0.938	197	5.00	5.00	5.00	5.00	39.5
1319	0.938	197	4.88	4.88			40.5
1320	0.938	197	4.75	4.75	4.75	4.75	41.6
1321	0.938	197	5.00	5.00	5.00	5.00	39.5
1322	0.938	197	4.50	4.50			43.9
1323	0.938	197	4.00	4.00	4.00	4.00	49.4
1324	0.938	197	4.29	4.26			46.0
1325	0.938	197	4.58	4.53			43.1
1326	0.938	197	4.87	4.79			40.6
1327	0.938	197	5.16	5.05	4.50	6.00	38.3
1328	0.938	197	5.01	5.00	4.98	5.11	39.4
1329	0.938	197	4.88	4.88			40.5
1330	0.938	197	4.76	4.76			41.5
1331	0.938	197	4.64	4.64			42.6
1332	0.938	197	4.52	4.52	4.52	4.52	43.7
1333	0.938	197	4.72	5.00	4.44	5.00	41.8
1334	0.938	197	4.61	4.61			42.8
1335	0.938	197	4.50	4.50	4.50	4.50	43.9
1336	0.938	197	4.75	4.75			41.6
1337	0.938	197	5.00	5.00	5.00	5.00	39.5
1338	0.938	197	4.90	4.90			40.3

Table A3.1 (cont.). Exchange rate of mark silver/lödlig in mark penningar/lörtug 1277–1541.

Year	Fineness of silver mark, assumption	Fine silver content of silver mark, grams	Exchange rate, likely mean	Exchange rate, likely median	Exchange rate, lowest recorded	Exchange rate, highest recorded	Fine silver content of mark in grams, based on exchange rate
1339	0.938	197	4.80	4.80	4.80	4.80	41.1
1340	0.938	197	5.00	5.00	5.00	5.00	39.5
1341	0.938	197	5.10	5.10			38.7
1342	0.938	197	5.20	5.20			38.0
1343	0.938	197	5.30	5.30			37.3
1344	0.938	197	5.40	5.40			36.6
1345	0.938	197	5.50	5.50	5.00	6.00	35.9
1346	0.938	197	5.00	5.00	5.00	5.00	39.5
1347	0.938	197	5.00	5.00	5.00	5.00	39.5
1348	0.938	197	5.00	5.00	5.00	5.00	39.5
1349	0.938	197	4.87	4.87			40.5
1350	0.938	197	4.67	4.50	4.50	5.00	41.6
1351	0.937	197	5.34	6.00	5.01	7.00	36.9
1352	0.937	197	9.52	9.85			20.7
1353	0.937	197	13.70*	13.70*	13.70*	13.70*	14.4*
1354	0.937	197	5.00 (15**)	5.00 (15**)	5.00	5.00	39.3 (13.1**)
1355	0.936	197	5.42	5.42	5.42	5.42	36.2
1356	0.936	197	5.42	5.42	5.42	5.42	36.1
1357	0.936	197	5.00	5.00	5.00	5.00	39.1
1358	0.936	197	5.42	5.42	5.42	5.42	36.0
1359	0.935	197	6.00	6.00	6.00	6.00	32.5
1360	0.935	197	5.71	5.71	5.42	6.00	34.1
1361	0.935	197	12*	12*	5.5*	12-20*	16.2*
1362	0.935	197	12	12			16.2
1363	0.934	197	5.42 (12**)	5.42 (12**)	5.42	5.42	35.8 (16.2**)
1364	0.934	197	6.00	6.00	6.00	6.00	32.3
1365	0.934	197	6.00	6.00	6.00	6.00	32.2
1366	0.934	197	7.00	8.00	5.00	8.00	27.6
1367	0.933	197	5.50	5.50	5.00	6.00	35.0
1368	0.933	197	4.88	4.50	4.50	6.00	39.5
1369	0.933	196	5.72	6.00	4.50	6.00	33.6
1370	0.933	196	5.32	5.50	4.50	6.00	36.0
1371	0.932	196	5.69	6.00	4.50	6.00	33.7
1372	0.932	196	6.00	6.00	6.00	6.00	31.9
1373	0.932	196	6.00	6.00	6.00	6.00	31.8
1374	0.932	196	5.25	5.25	4.50	6.00	36.3
1375	0.931	196	6.00	6.00	6.00	6.00	31.7
1376	0.931	196	5.59	6.00	4.50	6.00	34.0

Table A3.1 (cont.). Exchange rate of mark silver/lödlig in mark penningar/lörtug 1277–1541.

Year	Fineness of silver mark, assumption	Fine silver content of silver mark, grams	Exchange rate, likely mean	Exchange rate, likely median	Exchange rate, lowest recorded	Exchange rate, highest recorded	Fine silver content of mark in grams, based on exchange rate
1377	0.931	196	5.84	6.00	4.50	7.20	32.5
1378	0.931	196	5.50	6.00	4.50	6.50	34.5
1379	0.930	196	6.00	6.00	6.00	6.00	31.5
1380	0.930	196	5.63	6.00	4.50	6.00	33.6
1381	0.930	196	5.95	6.00	4.50	6.50	31.7
1382	0.930	196	6.05	6.00	6.00	6.50	31.2
1383	0.930	196	6.05	6.00	4.50	7.00	31.1
1384	0.929	196	5.80	6.00	4.50	6.50	32.4
1385	0.929	196	6.03	6.00	5.00	6.50	31.1
1386	0.929	196	6.00	6.00	5.00	6.50	31.2
1387	0.929	196	5.75	6.00	5.00	7.00	32.5
1388	0.928	196	6.17	6.00	6.00	6.50	30.3
1389	0.928	195	6.38	6.25	6.00	7.00	29.2
1390	0.928	195	6.13	6.00	6.00	7.00	30.4
1391	0.928	195	6.40	6.00	6.00	7.00	29.0
1392	0.927	195	6.25	6.00	6.00	7.00	29.7
1393	0.927	195	6.00	6.00	6.00	6.00	30.9
1394	0.927	195	6.29	6.00	6.00	7.00	30.0
1395	0.927	195	6.00	6.00	6.00	6.00	30.8
1396	0.926	195	6.00	6.00	6.00	6.00	30.7
1397	0.926	195	6.12	6.12			30.1
1398	0.926	195	6.25	6.00	6.00	7.00	29.4
1399	0.926	195	6.13	6.00	6.00	7.00	30.0
1400	0.925	195	6.08	6.00	6.00	7.00	30.1
1401	0.925	195	6.13	6.00	6.00	7.20	29.9
1402	0.925	195	6.23	6.00	6.00	7.00	29.3
1403	0.925	195	6.14	6.00	6.00	7.00	29.7
1404	0.924	195	6.14	6.00	6.00	7.00	29.7
1405	0.924	195	6.29	6.00	6.00	8.00	28.9
1406	0.924	195	6.00	6.00	6.00	6.00	30.3
1407	0.924	195	6.17	6.00	6.00	7.00	29.4
1408	0.923	194	6.45	6.45			28.1
1409	0.923	194	6.75	6.50	6.00	8.25	26.8
1410	0.923	194	6.58	6.50	6.00	7.50	27.4
1411	0.923	194	6.60	6.00	6.00	8.00	27.3
1412	0.922	194	7.00	7.00	6.00	8.00	25.7
1413	0.922	194	7.10	7.00	6.00	8.50	25.3
1414	0.922	194	7.50	8.00	6.00	8.50	23.9

Table A3.1 (cont.). Exchange rate of mark silver/lödig in mark penningar/lörtug 1277–1541.

Year	Fineness of silver mark, assumption	Fine silver content of silver mark, grams	Exchange rate, likely mean	Exchange rate, likely median	Exchange rate, lowest recorded	Exchange rate, highest recorded	Fine silver content of mark in grams, based on exchange rate
1415	0.922	194	8.00	8.00	8.00	8.00	22.4
1416	0.922	194	8.00	8.00	8.00	8.00	22.4
1417	0.921	194	7.43	8.00	6.00	8.50	24.0
1418	0.921	194	8.00	8.00	8.00	8.00	22.3
1419	0.921	194	7.25	7.50	6.00	8.00	24.6
1420	0.921	194	7.00	7.00	6.00	8.00	25.4
1421	0.920	194	7.67	7.50	6.00	9.00	23.2
1422	0.920	194	8.33	8.00	8.00	9.00	21.3
1423	0.920	194	8.00	8.00	8.00	8.00	22.2
1424	0.920	194	8.00	8.00	8.00	8.00	22.2
1425	0.919	194	8.00	8.00	8.00	8.00	22.2
1426	0.919	194	8.25	8.25	8.00	8.50	21.6
1427	0.919	194	8.00	8.00	8.00	8.00	22.2
1428	0.919	193	8.50	8.50	8.00	9.00	20.9
1429	0.918	193	8.50	8.50	8.50	8.50	20.9
1430	0.918	193	8.25	8.25	8.00	8.50	21.6
1431	0.918	193	8.25	8.25	8.00	8.50	21.6
1432	0.918	193	8.50	8.50	8.50	8.50	21.0
1433	0.917	193	8.33	8.50	8.00	8.50	21.4
1434	0.917	193	8.50	8.50	8.50	8.50	21.0
1435	0.917	193	8.50	8.50	8.50	8.50	21.0
1436	0.917	193	8.50	8.50	8.50	8.50	21.0
1437	0.916	193	8.40	8.50	8.00	8.50	21.2
1438	0.916	193	8.50	8.50	8.50	8.50	21.0
1439	0.916	193	8.33	8.50	8.00	8.50	21.4
1440	0.916	193	8.33	8.50	8.00	8.50	21.4
1441	0.915	193	9.00	9.00	8.50	9.50	19.8
1442	0.915	193	8.67	8.50	8.50	9.00	20.6
1443	0.915	193	8.50	8.50	8.00	9.00	21.0
1444	0.915	193	8.58	8.50	8.00	9.50	20.8
1445	0.914	193	8.75	9.00	8.00	9.00	20.4
1446	0.914	193	8.83	9.00	8.50	9.00	20.2
1447	0.914	193	8.67	8.50	8.00	9.00	20.6
1448	0.914	192	8.67	8.50	8.50	9.00	20.6
1449	0.914	192	8.68	8.50	8.50	9.00	20.6
1450	0.913	192	8.86	8.50	8.00	11.00	20.2
1451	0.913	192	8.50	8.50	8.00	9.00	21.0
1452	0.913	192	9.00	9.00	9.00	9.00	19.9

Table A3.1 (cont.). Exchange rate of mark silver/lödlig in mark penningar/lörtug 1277–1541.

Year	Fineness of silver mark, assumption	Fine silver content of silver mark, grams	Exchange rate, likely mean	Exchange rate, likely median	Exchange rate, lowest recorded	Exchange rate, highest recorded	Fine silver content of mark in grams, based on exchange rate
1453	0.913	192	8.51	8.50	8.10	9.00	21.0
1454	0.912	192	8.70	9.00	8.00	9.00	20.6
1455	0.912	192	8.50	8.50	8.00	9.00	21.0
1456	0.912	192	8.63	8.63			20.7
1457	0.912	192	8.75	8.75	8.50	9.00	20.4
1458	0.911	192	8.75	9.00	8.00	9.00	19.9
1459	0.911	192	8.50	8.50	8.50	8.50	21.1
1460	0.911	192	8.50	8.50	8.00	9.00	21.1
1461	0.911	192	9.14	9.00	8.50	9.50	19.6
1462	0.910	192	9.07	9.00	8.50	10.00	19.7
1463	0.910	192	9.36	9.00	9.00	10.00	19.1
1464	0.910	192	9.00	9.00	9.00	9.00	19.9
1465	0.910	192	9.25	9.25	9.00	9.50	19.4
1466	0.909	192	9.00	9.00	9.00	9.00	19.9
1467	0.909	191	8.75	8.75	8.50	9.00	20.5
1468	0.909	191	9.50	9.50	9.00	10.00	18.9
1469	0.909	191	9.50	9.50	9.00	10.00	18.9
1470	0.908	191	9.80	10.00	9.00	10.00	18.3
1471	0.908	191	9.13	9.00	8.50	10.00	19.7
1472	0.908	191	9.67	10.00	9.00	10.00	18.6
1473	0.908	191	9.33	9.00	9.00	10.00	19.2
1474	0.907	191	9.50	9.50	9.00	10.00	18.9
1475	0.907	191	10.00	10.00	10.00	10.00	17.9
1476	0.907	191	10.00	10.00	10.00	10.00	17.9
1477	0.907	191	9.50	10.00	8.50	10.00	18.9
1478	0.906	191	9.50	9.50	9.00	10.00	18.9
1479	0.906	191	9.71	10.00	9.00	11.00	18.5
1480	0.906	191	9.00	9.00	9.00	9.00	20.0
1481	0.905	191	10.75	10.75	9.50	12.00	16.7
1482	0.904	190	9.75	9.75	9.50	10.00	18.4
1483	0.903	190	9.88	9.88			18.2
1484	0.903	190	10.00	10.00	10.00	10.00	18.0
1485	0.902	190	9.17	9.00	8.50	10.00	19.6
1486	0.901	190	10.00	10.00	10.00	10.00	18.0
1487	0.901	190	11.00	11.00	11.00	11.00	16.3
1488	0.900	190	10.66	10.66			16.9
1489	0.899	189	10.32	10.32			17.4
1490	0.899	189	10.00	10.00	10.00	10.00	18.0

Table A3.1 (cont.). Exchange rate of mark silver/lödig in mark penningar/lörtug 1277–1541.

Year	Fineness of silver mark, assumption	Fine silver content of silver mark, grams	Exchange rate, likely mean	Exchange rate, likely median	Exchange rate, lowest recorded	Exchange rate, highest recorded	Fine silver content of mark in grams, based on exchange rate
1491	0.898	189	9.88	9.88	9.50	10.00	18.2
1492	0.897	189	9.75	9.75	9.50	10.00	18.5
1493	0.897	189	11.00	11.00	11.00	11.00	16.4
1494	0.896	189	10.50	10.50	10.50	10.50	17.1
1495	0.895	189	10.25	10.25	10.00	10.50	17.6
1496	0.894	188	10.00	10.00	10.00	10.00	18.0
1497	0.894	188	10.00	10.00	10.00	10.00	18.0
1498	0.893	188	10.33	10.50			17.6
1499	0.892	188	10.67	11.00	10.00	11.00	17.2
1500	0.892	188	12.00	12.00	12.00	12.00	15.0
1501	0.891	188	12.24	12.24			14.7
1502	0.890	188	12.49	12.49			14.4
1503	0.890	187	12.74	12.74			14.2
1504	0.889	187	13.00	13.00	13.00	13.00	13.9
1505	0.888	187	12.50	12.50	12.00	13.00	14.4
1506	0.888	187	13.00	13.00	13.00	13.00	13.9
1507	0.887	187	13.00	13.00	13.00	13.00	13.9
1508	0.886	187	13.00	13.00	13.00	13.00	13.9
1509	0.885	186	13.00	13.00	13.00	13.00	13.9
1510	0.885	186	13.00	13.00	13.00	13.00	13.9
1511	0.884	186	13.00	13.00	13.00	13.00	13.9
1512	0.883	186	13.00	13.00	13.00	13.00	13.9
1513	0.883	186	14.50	14.50			12.5
1514	0.882	186	16.00	16.00	16.00	16.00	11.3
1515	0.881	186	16.00	16.00	16.00	16.00	11.3
1516	0.881	185	12.00	12.00	12.00	12.00	15.1
1517	0.880	185	14.00	14.00	14.00	14.00	12.9
1518	0.879	185	16.00	16.00	16.00	16.00	11.3
1519	0.878	185	16.00	16.00	16.00	16.00	11.3
1520	0.878	185	15.00	15.00	14.00	16.00	12.1
1521	0.877	185	22.00	22.00	22.00	22.00	8.2
1522	0.876	185	36.00	36.00			5.0
1523	0.876	184	50.00	50.00	16.00	50.00	3.6
1524			19.25	19.25	19.25	19.25	9.4 (3.6**)
	0.875	184	(50**)	(50**)			
1525	0.875	184	16.00	16.00	16.00	16.00	11.3
1526	0.875	184	17.33	17.33			10.4
1527	0.875	184	18.67	18.67			9.7

Table A3.1 (cont.). Exchange rate of mark silver/lödlig in mark penningar/örtug 1277–1541.

Year	Fineness of silver mark, assumption	Fine silver content of silver mark, grams	Exchange rate, likely mean	Exchange rate, likely median	Exchange rate, lowest recorded	Exchange rate, highest recorded	Fine silver content of mark in grams, based on exchange rate
1528	0.875	184	20.00	20.00	20.00	20.00	9.0
1529	0.875	184	20.00	20.00	18.00	24.00	9.0
1530	0.875	184	20.00	20.00	24.00	24.00	9.0
1531	0.875	184	20.00	20.00	16.00	20.00	9.0
1532	0.875	184	20.00	20.00			9.0
1533	0.875	184	20.00	20.00			9.0
1534	0.875	184	20.00	20.00			9.0
1535	0.875	184	20.00	20.00	16.00	24.00	9.0
1536	0.875	184	20.00	20.00	18.00	20.00	9.0
1537	0.875	184	20.00	20.00			9.0
1538	0.875	184	20.00	20.00	20.00	24.00	9.0
1539	0.875	184	20.00	20.00	24.00	24.00	9.0
1540	0.875	184	20.00	20.00	24.00	24.00	9.0
1541	0.875	184	20.00	20.00	19.33	19.33	9.0

* Cross rates based on foreign exchange rates or prices.

** Debased coins.

Comment: Values in italics are intrapolarations or guesstimates.

Sources: *Arvid Trolles jordebok 1498* (1938, pp. 186, 194–5, 200 and 205), *Dalslands diplomatarium* (1996, pp. 131, 203, 230 and 245), *Diplomatarium dalekarlicum, vol. 3* (1846, pp. 197–8), *Diplomatarium Norvegicum, vol. 16* (1903, no. 169, 189, 209, 211 and 323), Dijkman (1686), Doving (1947, p. 194), Forssell (1872, pp. 22–4, 52 and 90–1), Franzén (2006), Gillingstam (1996, pp. 129 and 135–6), Lönnroth (1940, pp. 145–6, 192, 196–7, 200 and 203–4), *Närkes medeltida urkunder 1. Riseberga kloster* (1935, pp. 67 and 106), *Raven van Barnekows räkenskaper för Nyköpings fögderi 1365–1367* (1994), SDhk, *Stockholms stads jordebok 1420–1474* (1876, pp. 16, 25, 38, 52, 69, 73, 107, 113–4, 245, 253, 257 and 418–20), *Stockholms stads tänkeböcker 1474–1483 samt bur-språk* (1917, p. 327), *Stockholms stads tänkeböcker 1483–1492* (1944, p. 84), Styffe (1875, pp. cxxvi n 2, cxxxvii n 2), *Svenska medeltidsregister 1434–1441* (1937, pp. 160, 330 and 506), *Svenska rikshandens pergamentsbref: från och med år 1351. D. 1, 1351–1382, D. 2, 1383–140*, and Thordeman (1936). See also the main text.

Table A3.2. Value of mark silver and the Swedish mark in mark gutnisk/stackot/tysk/östgötsk 1211–1538.

Year	1 silver mark in mark gutnisk/stackot/tysk/östgötsk	1 Swedish mark in mark gutnisk/stackot/tysk/östgötsk	Relation	Source
1211	4.5		1 mark silver = 4.5 mark gutnisk.	Myrberg (2008, p. 88)
1265	6		1 mark silver = 6 mark rigisk. We assume: 1 mark gutnisk = 1 mark rigisk.	Table A3.5
1312	7	1.4	1 mark silver = 5 mark svensk = 7 mark gutnisk	SDhk 2506
1333			1 mark Skara weight [215 gram] Gotlandic coins = 38 ² / ₃ gros tournois [= 3.4-4 mark penningar]	Fritz and Bäärnhelm (1990, no. 234)
1343			1 Gotlandic mark silver = 30 groat of Flanders (= 0.9-1.1 mark of Lübeck).	Fritz and Bäärnhelm (1990, no. 461), and Spufford (1986, pp. 226-227)
1351		0.9?	44 mark silver, 9 öre and 1 örtug in Gotlandic coins = 132 mark and 6 öre in Swedish coins, i.e. 1 mark silver of Gotland (= 2 ² / ₃ mark gutnisk?) ≈ 3 mark örtug	Hyötyniemi (1999, p. 8)
1354			Gotlandic pennies were evaluated to the old Swedish coin	SDhk 6802
1364	7.75	(1.3)	1 mark silver = 7.75 mark in Gotlandic coins	Hyötyniemi (1999, p. 15)
1389	(7.7)	1.2	1 gotnisk penning [= 1/32 mark tysk/gutnisk] = 5 svenska penningar.	Hildebrand (1894, p. 941)
1402			1 Gotlandic silvermark = 32 [Gotlandic] öre	Hyötyniemi (1999, p. 9)
1405	(6.3)	1	'swænska pæninga' [örtug] = 8 'pæninga' and 'gutniscan pæning' = 6 'pæninga'. We assume: 1 öre gutnisk = 4 gutniska penningar	SDhk 16470
1408	(8)	(1.25)	2 'artinge gotländisch' [= 2/32 mark gutnisk] = 1/60 Prussian mark. We assume: 1 Prussian mark = 3 mark örtug	Joachim (1896, p. 450)
1411		(1)	1 öre (gutnisk) = 4 'gotlandske penge' = 3 'hvide tyske penge' [i.e. 1 mark lybsk = 2 mark gutnisk]. We assume: 1 mark örtug = ½ mark lybsk.	Danmarks riges breve, 4. række, bind 12, 1410–12, no. 310
1413	(11)	1.5	24 mark 'thyst tal, ok tho i gotniskom pæningom' = 16 mark 'swenska pæninga'	SDhk 18147
1420	15	(1.9)	1 mark lödig = 15 mark (Östergötland)	SDhk 19573
1420	15	(1.9)	1 mark lödig = 15 mark 'her i Østergötlande'	SDhk 19579

Table A3.2 (cont.). Value of mark silver and the Swedish mark in mark gutnisk/stackot/*tysk/östgötsk* 1211–1538.

Year	1 silver mark in mark gutnisk/stackot/tysk/östgötsk	1 Swedish mark in mark gutnisk/stackot/tysk/östgötsk	Relation	Source
1422	14	(1.7)	1 mark lödig = 14 mark gutniska	Dovring (1947, p. 195)
1424			1 gute = 3/8 German Witten, i.e. [i.e. 1 mark of Lübeck = 4 mark gutnisk]	Lundholm (1956, p. 212)
1426	15	(1.8)	1 mark lödig = 15 mark (Skänninge, Östergötland)	B.E. Hildebrands samlingar, vol 5
1426	20	(2.4)	1 mark lödig = 20 mark in Östergötland	Hildebrand (1894, p. 941)
1427	(16)	2	1 mark gutnisk = ½ mark svensk	Dovring (1947, p. 195)
1430	20	(2.4)	1 mark lödig = 20 penningemarker in Östergötland	Hildebrand (1894, p. 941)
1431	20	(2.4)	1 mark lödig = 20 mark (Hanekind, Östergötland)	B.E. Hildebrands samlingar, vol 5
1432	18	(2.1)	1 mark lödig = 18 mark gutniska	Dovring (1947, p. 195)
1434	(21)	(2.5)	1 noble = 10 mark gutniska. We assume: 1 noble = 4 mark örtug.	Hallenberg (1798, p. 17)
1440	28	(3.4)	1 mark lödig = 28 mark (Linköping)	Lappkatalogen nr 46
1440	30	(3.6)	1 mark lödig = 30 mark (Linköping)	Lappkatalogen nr 64
1444	40	(4.6)	1 mark lödig = 40 mark (Linköping)	Lappkatalogen nr 152
1445	40	(4.5)	1 mark lödig = 40 mark (Skänninge, Östergötland)	B.E. Hildebrands samlingar, vol 5
1446	(36)	4	1 öre (gutnisk) = 6 penningar = 3 'svarta gutar'.	Dovring (1947, p. 197)
1450	40	(4.5)	1 mark lödig = 40 mark (Skänninge, Östergötland)	B.E. Hildebrands samlingar, vol 5
1453	(51?)	(6?)	8 'gotniska bode nye oc gamble gongen' = 1 örtug. We assume: 4 'gotniska' = 1 öre gutnisk = 1/8 mark gutnisk.	Liedgren (1967, p. 15)
1453	(34?)	(4?)	8 'gotniska bode nye oc gamble gongen' = 4 'grossa' = 1 örtug. Hyötyniemi assume: 3 grossa = 1 öre gutnisk.	Liedgren (1967, p. 15), and Hyötyniemi (2002)
1455		3 or 4?	1 mark svensk = 3 mark gutnisk.	Dovring (1947, p. 195)
1456	(35)	4	1 öre (gutnisk) = 6 penningar = 2 danska vita.	Dovring (1947, p. 197)
1457		3	1 mark stockholmsmynt = 3 mark grossa.	Sjögren (1944, p. 354)
1459	30	(3.5)	1 mark lödig = 30 mark gutnisk	Dovring (1947, p. 195)
1461	40	(4.4)	1 mark lödig = 40 mark in 'Vadstena östgötska penningar'	RA, pergamentsbrev 1461-01-03
1464	(36)	4	1 öre gutnisk = 6 penningar	Dovring (1947, p. 196)
1472	(39)	(4)	1 gyllen = 6 mark gunniska/stackota (the two were used as synonyms). We assume: 1 gyllen = 1.5 mark örtug	Hildebrand (1894, p. 942)
1473		3 or 4?	1 mark svensk = 3 mark gutnisk.	Dovring (1947, p. 195)

Table A3.2 (cont.). Value of mark silver and the Swedish mark in mark gutnisk/stackot/*tysk/östgötsk* 1211–1538.

Year	1 silver mark in mark gutnisk/stackot/tysk/östgötsk	1 Swedish mark in mark gutnisk/stackot/tysk/östgötsk	Relation	Source
1474		3 or 4?	1 mark svensk = 3 mark gutnisk.	Dovring (1947, p. 195)
1479		3 or 4?	1 mark svensk = 3 mark gutnisk.	Dovring (1947, p. 195)
1480	16	1.4	1 mark lödig = 16 mark 'gutniska vita' = 12 mark 'Stockholms halvörtugar' = 11.5 mark 'nya Stockholms örtug'. Probably relates to the metallic contents of coins rather than actual value relations.	Dovring (1947, p. 197)
1482		3 or 4?	1 mark svensk = 3 mark gutnisk.	Dovring (1947, p. 195)
1482	(53)	5 ½	1 öre stackot = ½ skilling [= 1/32 mark dansk]	Lundholm (1956, p. 212)
1487	(40)	4	Mark gutnisk was probably here used as a unit of account.	Sjögren (1944, pp. 120–1)
1487		3	4×18 örtugar = 9 mark gutniska	Sjögren (1944, p. 354)
1496		3 or 4?	1 mark svenska = 3 mark stackota	Hyötyniemi (2000, p. 51)
1513	(< 39)	< 2½	Flour was purchased for 2 marks danska and sold for 4 marks gutniska [probably Gotlandic hvids, containing 0.1–0.13 grams fine silver per hvid]. Two other goods were sold for 16 and 33 per cent, respectively, above the purchase price. We assume 2 marks danska = 1.5 mark örtug.	SDhk 37475
1514	48	(3)	1 mark lödig = 48 mark gutnisk	Dovring (1947, p. 195)
1515	(64)	4	Mark gutnisk was probably here used as a unit of account.	Lundholm (1956, p. 229)
1533	(68)	4	Mark gutnisk was here a unit of account	Hallenberg (1798, pp. 170–2)
1535	(68)	4	Mark gutnisk was here a unit of account	Hallenberg (1798, pp. 172–3)
1536	(72)	4	Mark gutnisk was here a unit of account	Hallenberg (1798, pp. 173–4)
1537	(76)	4	Mark gutnisk was here a unit of account	Hallenberg (1798, pp. 174–5)
1538	(80)	4	Mark gutnisk was here a unit of account	Hallenberg (1798, pp. 181–7)

Comments: The numbers in parentheses are our own estimates based on cross exchange rates (mainly through mark lödig in mark örtug); a question mark signifies a very uncertain interpretation of the sources.

Table A3.3. Value of mark silver and the Swedish mark in marks of other Nordic regions.

Year	1 silver mark in Nordic marks	1 Swedish mark in Nordic marks	Relation/mark currency	Source
1231	3		Danish mark	Fauerholdt Jensen (1980, p. 88)
1240	2		1 mark silver = 2 Danish mark penningar [older coins]	Fauerholdt Jensen (1980, p. 88)
1256	3.71		Danish mark	KHL, 'Myntförsämring'
1263-1266	4.44		Danish mark	KHL, 'Myntförsämring'
1275	3		Norwegian mark	KHL, 'Myntförsämring'
1275/1280	4		Norwegian mark	KHL, 'Myntförsämring'
1285	3		Norwegian mark	Nordström (1850, p. 38)
1274-1282	4.8 (5 in Danish weight)	1	1 mark silver Danish weight = 1.04 mark silver Swedish weight = 5 Danish mark = 5 Swedish mark	Fauerholdt Jensen (1980, pp. 30 and 81-86), and SDhk 1207
1282			1 mark in Swedish weight = 0.96 mark in Danish weight	Fauerholdt Jensen (1990, p. 81)
1296	6.67	(1.3-2.2)	Danish mark	KHL, 'Myntförsämring'
1298	5.33	(1-1.5)	Danish mark	KHL, 'Myntförsämring'
1299	4.5	(1)	Norwegian mark	KHL, 'Myntförsämring'
1306	8	(2)	Danish mark	KHL, 'Myntförsämring'
1311	4.5	(0.9)	Norwegian mark	KHL, 'Myntförsämring'
1313	4.07	(0.8)	Scania mark	KHL, 'Myntförsämring'
1313-1314	10-10.67	(2)	Danish mark	KHL, 'Myntförsämring'
1325	4.5	(0.9)	Scania mark	KHL, 'Myntförsämring'
1326	4.5	(0.9)	Norwegian mark	KHL, 'Myntförsämring'
1332-1334	(4.5)	8/9	1 mark of Scania = 1 mark 1 öre of Sweden	Franzén (2006, p. 157)
1332-1334	(4.5)	8/9	1 Swedish mark = 10 2/3 gros tournois and 1 mark of Scania = 12 gros tournois	Fritz and Bäärnhielm (1990, no. 146)
1334	4.5	(0.8-0.9)	1 mark of Scania = 1 skilling (12) gros tournois. We assume: 1 mark penningar = 9.6-11.3 gros tournois.	Fauerholdt Jensen (1980, p. 20), Table A3.6
1338	10	(2)	Danish mark	KHL, 'Myntförsämring'
1348	(5)	1	Monetary union between Sweden and Norway	Rasmusson (1943, p. 270)
1350s	4.44-5	(0.8-1)	Norwegian mark	KHL, 'Myntförsämring'
1355	(5-6)	1	Monetary union between Sweden and Norway	Rasmusson (1943, p. 270)
1358	(5-6)	1	Monetary union between Sweden and Norway	Rasmusson (1943, p. 270)
1350-1360	5	(0.8-1)	Scania mark	KHL, 'Myntförsämring'
1357	4.3	(0.8-0.9)	Scania mark	Fauerholdt Jensen (1980, p. 23)
1357	(4)	(0.8)	1 Danish mark = 10 schillinge of Lübeck. We assume: 1 Swedish mark = 8 schillinge of Lübeck.	Spufford (1986, p. 283)

Table A3.3 (cont.). Value of mark silver and the Swedish mark in marks of other Nordic regions.

Year	1 silver mark in Nordic marks	1 Swedish mark in Nordic marks	Relation/mark currency	Source
1358	5	(0.9)	1 mark silver = 5 new mark of Scania	Fritz and Bäärnhielm (1990, no. 1080)
2 nd half of 14 th century	6	(1)	Norwegian mark	KHL, 'Myntförsämring'
1360	(4.8)	0.83	5 mark of Scania = 6 mark 1 öre of Sweden	Franzén (2006, p. 157)
1369	5.625		Scania mark	KHL, 'Myntförsämring'
1380	(4.5)	(0.6)	12 Witten of Flensburg = 10 Witten of Lübeck. We assume: 1 Swedish mark = 24 Witten of Lübeck.	KHL, 'Hvid'
1386	(4.8)	(0.8)	1 Danish mark = 10 schillinge of Lübeck. We assume: 1 Swedish mark = 8 schillinge of Lübeck.	Spufford (1986, p. 283)
1406	(4)	(0.67)	1 Danish mark = 12 schillinge of Lübeck. We assume: 1 mark of Lübeck = 2 mark örtug.	Spufford (1986, p. 283)
1420	3	(0.375)	4 'ængliscra' [= 1/64 Danish mark, although this may have not been Danish money] = 1 'øre', 8 'øra' = 1 mark, 1 'lødhogh mark' = 6 mark	SDhk 19466
1424			1 Danish Witten = ½ Witten of Lübeck and 1 Danish penning = ½ lybsk penning, i.e. 1 mark of Lübeck = ½ Danish mark.	Lundholm (1956, p. 212)
1437	(6.1)	0.73	17 mark jämtsk 4 öre = 24 mark svenska	Ahnlund (1948, p. 482)
1453	(11.3)	4/3	1 'dansk hwit' [4-penning-coin] = 3 'peninga'	Liedgren (1967, p. 15)
1453	(10.2)	1.2	1 'dansk Skilling' = 10 'peninga'	Liedgren (1967, p. 15)
1453	(12.8)	1.5	1 'ny dansk Ängilsk' [new 3-penning-coin] = 2 'peninga'	Liedgren (1967, p. 15)
1453	(8.5)	1	1 'gammal Ängilsk' [old 3-penning-coin of Denmark = 1/64 Danish mark] = 3 'peninga'	Liedgren (1967, p. 15)
1456	(35)	4/3	6 penningar = 2 danska vita [= 2/48 Danish mark].	Dovring (1947, p. 197)
1480	14	1.19	1 mark lödig = 14 mark 'kung Kristians vita' = 12 mark Stockholms halvörtugar = 11.5 mark Stockholms örtugar.	Dovring (1947, p. 197)
1480	13.6	1.15	1 mark lödig = 13.5 mark and ½ öre 'danska vita' = 12 mark Stockholms halvörtugar = 11.5 mark Stockholms örtugar.	Dovring (1947, p. 197)
1493	(13.3)	4/3	2 'danska gamla vita mark' = 1 Rhinish gulden. We assume: 1 Rhinish gulden = 1.5 mark örtug	Arvid Trolles jordebok 1498 (p. 249, no. 174)
1539		4/3	1 Danish mark = 6 öre	Hallenberg (1798, p. 150)
1541		0.9	1 joakimsdaler = 3 mark danskt mynt. We assume: 1 joakimsdaler = 3.5 mark in Swedish coins	SS, O:1, f. 74
1545		0.8	3 mark danska penningar = 5 mark danska i svenska penningar = 3 mark 6 öre mark örtug	Hallenberg (1798, p. 307)
1602		1	1 Danish mark = 8 öre	SS, O:1, f. 141
1618		0.8	1 Danish mark = 10 öre	SS, OO, f. 597

Table A3.4. Value of mark silver and the Swedish mark in mark of Lübeck.

Year	1 silver mark in mark of Lübeck	1 Swedish mark in mark of Lübeck	Relation	Source
1307	2.75	(0.55)	1100 mark lübska penningar = 400 mark lödigt silver	SDhk 2227
1342	2.8	(0.56)	1 mark silver = 45 schillinge of Lübeck.	Fauerholdt Jensen (1990, p. 21)
1349	(2.5)	0.5	165 'mark lybskt mynt' = 330 'mark gängse svenskt mynt'	SDhk 5862
1361	?	<0.5	'en eller flera penningar i nu gängse mynt' = 'högst ½ penning lybskt mynt'	SDhk 8044
1364	(3)	0.5	2600 mark penningar = 1300 mark lybska	Franzén (2006, p. 287)
1367	(2.5)	0.5	1 penning = ½ lybsk penning	SDhk 9056
1375	(3)	0.5	1 lybsk penning = 2 svenska penningar	SDhk 10692
1376	(3)	0.5	5 lybska mark = 10 mark svenska penningar	SDhk 40742
1390	(3.1)	0.5	1 mark of Lübeck = 2 Swedish mark	SRP 2499
1398	(4)	(0.625)	1 Prussian mark = 3 Swedish mark, and 1 Prussian mark = 30 schillinge of Lübeck (1399)	Hirsch (1858, p. 243), and Sattler (1887, p. 144)
1400	(2.6)	(0.43)	1 Prussian mark = 4 Swedish mark, and 1 Prussian mark = 27.25 schillinge of Lübeck	Hirsch (1858, p. 243), and Sattler (1887, p. 144)
1400	2.8	(0.46)	1 mark lödig = 45 schillinge of Lübeck	Fauerholdt Jensen (1990, p. 26)
1411	2.8	(0.43)	1 mark lödig = 45 schillinge of Lübeck	Fauerholdt Jensen (1990, p. 26)
1413	2.8	(0.4)	1 mark lödig = 45 schillinge of Lübeck (good ones)	Fauerholdt Jensen (1990, p. 27)
1424	(4)	0.5	4-penning coin minted in Åbo = 2 hollenpennings of Lübeck	Hallenberg (1798, p. 15)
1424	(5.25)	(0.66)	1 noble = 42 schillinge of Lübeck and 1 noble = 4 mark penningar	Hallenberg (1798, p. 15), and Hildebrand (1983, p. 946)
1425	2.8	(0.35)	1 mark lödig = 45 schillinge of Lübeck (probably older, better ones)	Fauerholdt Jensen (1990, p. 27)
1453	(9.3)	1.09	1 'Städer Skilling' = 11 'peninga'	Liedgren (1967, p. 15)
1453	(8.5)	1	8 'Städer peninga' = 1 örtug	Liedgren (1967, p. 15)
1460	(7.7)	0.96	1 mark = 23 solidi lub. [= 23/24 mark of Lübeck]	SDhk 27668
1484	(10)	1	1 mark of Lübeck = 1 Swedish mark	<i>Stockholms stads skottebok 1516–1525</i> (p. 307)
1524	(11)	0.67	1 mark of Lübeck = 1.5 Swedish mark	Hammarström (1956, p. 405)
1531	(8.5)	0.5	1 mark of Lübeck = 2 Swedish mark	Hammarström (1956, p. 405)
1532	(10.6)	0.625	1 mark of Sweden = 10 schillinge of Lübeck	*
1539		0.5	1 mark lybsk = 2 mark örtug	Hallenberg (1798, p. 150)
1541-1543		0.65	1 daler = 3 mark örtug = 31 sk Lybsk. We assume: 1 mark lödig = 20 mark örtug.	SS, OO, f. 173.
1544		0.5	1 mark lybsk = 2 mark örtug	Hallenberg (1798, p. 285)

* <http://www.histosem.uni-kiel.de/lehrstuehle/land/waehrung/Katalog.html>.

Table A3.5. Value of mark silver and the Swedish mark in mark rigisk/revalsk.

Year	1 silver mark in mark rigisk/revalsk	1 Swedish mark in mark rigisk/revalsk	Relation	Source
1211	4.5		1 mark rigisk = 1 mark gutnisk (=1/4.5 mark silver).	Myrberg (2008, p. 88)
1265	6		1 mark silver (Danish weight) [= 1.04 mark silver Swedish weight = 1.04 mark silver in the weight of Reval] = 6 mark revalsk 1 öre	Fauerholdt Jensen (1990, pp. 81–4)
1282			1 mark silver in Swedish weight = 1 mark silver in the weight of Reval	Fauerholdt Jensen (1990, p. 81)
1315	6		1 mark silver = 6 mark rigiska	Hyötyniemi (1999, p. 6)
1316	6		1 mark silver = 6 mark rigiska	Hyötyniemi (1999, p. 13)
1343			The coins of Riga were to be equal to Gotlandic coins.	Hauberg (1891)
1401	(7)	1.11*	1 öre = 5 räfliska	Nordström (1850, p. 161)
1404	(7)	1.11*	5 'räflisk' = 1 öre	KHL, 'Baltiska mynt'
1409	(6)	0.89*	4 'Ræffliska' = 1 'øra'	KHL, 'Baltiska mynt'
1409	(4)	0.59*	'en Ræuelisc ortogh fore IX peninga'	Åbo domkyrkas svartbok no. 322
1411	(7)	1.11*	5 revalska = 1 öre	De la Gardiska archivert 16 (1842, p. 181)
1414	(7)	0.89*	1 old (Åbo-)örtug = 6 penningar	KHL, 'Baltiska mynt'
1414	(8)	1.07*	1 revalsk = 5 svenska småpenningar	FMU 1426
1414	(8)	1.07*	1 revalsk = 5 svenska småpenningar	Åbo domkyrkas svartbok no. 345
1414	(13)	1.78*	1 revalsk = 3 penningar [official rate, probably not a market rate]	Åbo domkyrkas svartbok no. 349, KHL, 'Baltiska mynt'
1414	(9)	1.16*	'89 Åbo-mark (5 revalska = 1 öre – 1 penning)'	SDhk 18390
1415	(7)	0.89*	'40 mark viborgsmynt (4 revalska = 1 öre)'	SDhk 18543
1416	(9)	1.11*	1 revalsk skilling = 1/5 öre	Åbo domkyrkas svartbok no. 364
1416	(11)	1.33*	6 revalska örtug = 1 öre	Åbo domkyrkas svartbok no. 366
1418	(9)	1.07*	1 revalsk = 5 svenska småpenningar	FMU 1521
1431	(9)	1.11	5 revalska örtug = 1 öre	Åbo domkyrkas svartbok no. 435
1436	(11)	1.33	Åbosk penning [= 1/36 mark rigisk] = 4 penningar (according to the source, worth 6 penningar earlier)	Nordström (1850, p. 161)
1447	9	(1.04)	1 mark lödig = 9 mark rigisk	FMU 2698
1451	(8.5)	1	3 skilling rigiska = 2 örtug	KHL, 'Baltiska mynt'

Table A3.5 (cont.). *Value of mark silver and the Swedish mark in mark rigisk/revalsk.*

Year	1 silver mark in mark rigisk/revalsk	1 Swedish mark in mark rigisk/revalsk	Relation	Source
1453	(11)	1.33	1 öre = 6 aboskor	Stockholms stads jordebok 1420–1474 (p. 226)
1477	(8)	8/9	1 abo = 6 penningar	KHL, 'abo'
1505-1506	(14)	1.11		KHL, 'Baltiska mynt'
1527	(16)	8/9	1 mark rigisk = 9 öre	Hammarström (1956, p. 426)
1533	(16)	8/9	1034 mark revalska = 1163.25 mark örtug	<i>Handlingar till belysande af Finlands kamerala förhållanden på 1500-talet</i> , 1 (1892, p. 21)
1535	(16)	8/9	1298 mark rigiska = 1460 mark örtug	Hallenberg (1798, pp. 237–8)
1539		8/9	1548 mark 12 skilling rigiska = 1741.25 mark örtug	<i>Handlingar rörande Finlands kamerala förhållanden på 1500-talet</i> , 2 (1899, p. 1)
1541		8/9	1 mark [örtug] = 32 skilling [of Riga, 1 mark of Riga = 36 skilling]	Hallenberg (1798, pp. 238–9)

* See comment below.

Comment: There seem to be three different countings of mark rigisk in the Middle Ages. Up to the early 14th century the mark rigisk was set equal to 24 artig; during the 14th century up to the 1420s the mark silver of Riga was counted as 144 artig; from 1420s the mark of Riga was set equal to 36 old artig or new schillings. To present a consistent series, the table counts one mark rigisk as 36 revalsk for the first two decades of the 15th century as well (to estimate the value of the mark silver and Swedish mark in the higher-valued mark rigisk for this period, the data must be divided by four).

Table A3.6. *Value of the Swedish mark in gros tournois.*

Year	Assumed fine silver content in 1 gros tournois (gram)	Swedish mark in gros tournois	Implied fine silver content of the mark (gram)	Relation	Source
1291	4.044	10.2	41	25.5 gros tournois = 20 öre	SDhk 1499
1328	3.6	9.6	34.6	1 gros tournois = 20 penningar	Franzén (2006, p. 288)
1332	3.6	11.3	40.7	1 gros tournois = 17 penningar	Franzén (2006, p. 288)
1333	3.6	10%	38.4	4 solidus [12] gros tournois = 4 ½ mark	SDhk 3956
1334	3.6	10%	38.4	15 mark penningar = 13 solidus 4 gros tournois [=160 gros tournois], and 1 mark silver = 5 penningar	Fauerholdt Jensen, 1990 (pp. 82-83)
1339	3.6	9.6	34.6	1 solidus [12] gros tournois = 10 öre	SDhk 4541 and 4543
1357	3.6			1 mark silver Cologne weight = 5 skilling [12] gros tournois (old)	SDhk 7186

Comment: The gros tournois initially weighed 4.22 grams and had 23/24 fineness (*KHL*, 'grossus'), which deteriorated in the 14th century. In Denmark 1332–52, the circulating gros tournois weighed 3.888 grams with 25/27 fineness (Fauerholdt Jensen, 1990, p. 17).

Table A3.7. *Other exchange rates for foreign silver coins.*

Year	Relation	Specified in the source/comments	Source
1267	1 mark sterling = 160 sterling	Mark sterling probably refers to the Cologne mark silver.	SDhk 873
1272	1 mark silver/sterling = 144 sterling	Mark sterling probably refers to the Swedish mark silver.	SDhk 919
1282	1 mark silver in Swedish weight = 0.8533 mark in troy weight	167 mark silver in Swedish weight = 142 mark 4 ounce in troy weight [1 mark in troy weight = 8 ounces]	SDhk 1207, and Fauerholdt Jensen (1990, p. 81)
1328	1 pound sterling = 7.4 mark	67 pound 167 sterlings = 500 mark 6 ½ öre.	SDhk 3554
1328	1 pound sterling = 8 ⅓ mark	3 skilling sterling = 10 öre	Fritz and Bäärnhielm (1990, no. 135d)
1328	1 Bohemian penny = 20 Swedish pennies	1 Bohemian solidi = 10 öre	Fritz and Bäärnhielm (1990, no. 135c)
1398	1 Preussian mark = 3 mark		Styffe (1864, p. 57)
1414	1 Preussian mark = 2.5 mark	1 Preussian schillinge [=1/60 Preussian mark] = 8 penningar	Åbo domkyrkas svartbok nr 349
1416	1 Preussian mark = 2.5 mark	1 Preussian schillinge [=1/60 Preussian mark] = 1/3 öre	Åbo domkyrkas svartbok nr 364
1529	1 Preussian mark ≈ 1.3 mark	2968 Preussian mark ≈ 3900 mark örtug	Hammarström (1956, p. 426)

Table A3.8. *Exchange rate of noble in öre.*

Year	Noble in öre	Region	Source
1395	24	Uppland	Styffe (1864, p. 19)
1400	32	Östergötland	SDhk 15507
1410	40	Finland	FMU 1393
1421	16	Uppland	Handlingar rörande Helga Lekamens gille i Stockholm, I (1921)
1422	32	Finland	FMU 1709
1423	32	Finland	Åbo domkyrkas svartbok nr 403
1424	32	Finland	Åbo domkyrkas svartbok no. 415
1425	32	Finland	Åbo domkyrkas svartbok no. 418
1425	31	Uppland	Stockholms stads jordebok 1420–1474 (p. 32)
1426	32*	Finland	Åbo domkyrkas svartbok no. 421
1426	32	Södermanland	SDhk 20741
1430	32	Finland	FMU 1935
1431	33*	Finland	Åbo domkyrkas svartbok no. 437
1431	22	Uppland	Handlingar rörande Helga Lekamens gille i Stockholm, I (1921, p. 29: 32)
1431	32	Närke	Kumla kyrkas räkenskapsbok, p. 180
1432?	33*	Finland	Åbo domkyrkas svartbok no. 443
1433	32*	Finland	Åbo domkyrkas svartbok no. 444
1433	32*	Finland	Åbo domkyrkas svartbok no. 446
1434	32	Finland	FMU
1434	80***	Finland	Nordström (1850, p. 157)
1437	36*	Finland	Åbo domkyrkas svartbok no. 464
1438	36*	Finland	Åbo domkyrkas svartbok no. 474
1439	36*	Finland	Åbo domkyrkas svartbok no. 477
1439	34	Finland	Åbo domkyrkas svartbok no. 485
1440	34	Uppland	Handlingar rörande Helga Lekamens gille i Stockholm, I (1921, p. 43: 32)
1440	28	Uppland	Handlingar rörande Helga Lekamens gille i Stockholm, I (1921, p. 44: 28)
1441	36**	Finland	Åbo domkyrkas svartbok no. 464
1441	36	Finland	FMU 2388
1441	30	Uppland	Handlingar rörande Helga Lekamens gille i Stockholm, I (1921, p. 45: 6)
1441	28	Uppland	Handlingar rörande Helga Lekamens gille i Stockholm, I (1921, p. 45: 11)
1441	24	Uppland	Handlingar rörande Helga Lekamens gille i Stockholm, I (1921, p. 45: 16)
1442	32**	Finland	FMU 2455
1442	32	Uppland	Handlingar rörande Helga Lekamens gille i Stockholm, I (1921, p. 46: 15)
1443	36*	Finland	Åbo domkyrkas svartbok no. 515
1443	36	Finland	FMU 2547, probably Åbo marks
1448	36*	Finland	Åbo domkyrkas svartbok no. 540
1449	36*	Finland	Åbo domkyrkas svartbok no. 551

Table A3.8 (cont.). Exchange rate of noble in öre.

Year	Noble in öre	Region	Source
1450	36*	Finland	Åbo domkyrkas svartbok no. 556
1452	32	Finland	FMU 2901
1454	36*	Finland	Åbo domkyrkas svartbok no. 566
1454	34	Närke	Kumla kyrkas räkenskapsbok, p. 180
1454	32	Finland	Nordström (1850, p. 157)
1455	36	Närke	Kumla kyrkas räkenskapsbok, p. 180
1456	32*	Finland	Åbo domkyrkas svartbok no. 566
1456	35	Västmanland	Arboga stads tänkebok 1 (p. 60)
1456	32	Närke	Kumla kyrkas räkenskapsbok (p. 180)
1458	32	Finland	FMU 3068 and 3069
1477	38	Finland	FMU 3675
1478	40	Uppland	Funbo kyrkas räkenskapsbok, E 216, UUB
1527	72	Uppland	Räntekammarböcker, vol 1, RA

* Refers to Åbo-coins.

** Refers to Swedish coins.

*** Refers to Gotlandic coins.

Table A3.9. Exchange rate of Rhinish gulden in mark.

Year	Rhinish gulden in mark	Region	Source
1444	6*	Östergötland	Lappkatalogen, RA
1444	6*	Östergötland	SDhk 24505
1477	2**	Östergötland	Lars Sparres kopiebok B 15 f 218, RA
1482	2**	Östergötland	Lappkatalogen, no. 121, RA
1482	2**	Östergötland	B.E. Hildebrands samlingar, vol 5, Lappkatalogen no. 139
1485	2**	Östergötland	Petersson (1973, p. 325 n 22)
1486	2**	Östergötland	Lappkatalogen, RA
1489	2**	Stockholm	Petersson (1973, p. 325 n 22), SDhk 32241
1491	2**	Östergötland	Petersson (1973, p. 325 n 22)
1491	2**	Östergötland	Lappkatalogen, RA
1492	2**	Östergötland	Forssell (1872, p. 22)
1492	1½	Uppland	Stockholms stads tänkeböcker 1483–1492 (p. 512)
1492	1.5	Uppland	Stockholms stads tänkeböcker 1492–1500 (p. 10)
1492	1.5	Uppland	Sjögren (1944, p. 263)
1493	2**	Småland	Arvid Trolles jordebok 1498 (p. 249)
1493	2**		Petersson (1973, p. 325)
1493	1.5	Östergötland	Petersson (1973, p. 325)
1493	2**	Östergötland	SDhk 32853, Rääf (1856, p. 281)
1494	2**	Småland	Arvid Trolles jordebok 1498 (p. 249)
1495	2**	Östergötland	Petersson (1973, p. 325 n 22, Forssell (1872, p. 23)
1497	1.5	Uppland	KHL, 'Gyllen'
1498	2**	Östergötland	B.E. Hildebrands samlingar, vol 5

Table A3.9 (cont.). Exchange rate of Rhinish gulden in mark.

Year	Rhinish gulden in mark	Region	Source
1498	2**	Östergötland	Petersson (1973, p. 325 n 22)
1500	2**	Östergötland	B.E. Hildebrands samlingar, vol 5
1501	2**		Lappkatalogen, RA
1503	2**		Forssell (1872, p. 23)
1505	2**	Östergötland	B.E. Hildebrands samlingar, vol. 5
1505	2**	Östergötland	B.E. Hildebrands samlingar, vol. 6
1506	2**	Östergötland	B.E. Hildebrands samlingar, vol. 7
1506	2**	Östergötland	B.E. Hildebrands samlingar, vol. 8
1507	2**	Östergötland	B.E. Hildebrands samlingar, vol. 9
1508	2**	Östergötland	B.E. Hildebrands samlingar, vol. 10
1508	2**	Östergötland	B.E. Hildebrands samlingar, vol. 11
1508	2**	Östergötland	B.E. Hildebrands samlingar, vol. 12
1508	2**	Östergötland	B.E. Hildebrands samlingar, vol. 13
1509	2**	Östergötland	B.E. Hildebrands samlingar, vol. 14
1509	2**	Östergötland	B.E. Hildebrands samlingar, vol. 15
1509	2**	Östergötland	B.E. Hildebrands samlingar, vol. 16
1510	2**	Östergötland	B.E. Hildebrands samlingar, vol. 17
1510	2**	Östergötland	B.E. Hildebrands samlingar, vol. 18
1512	2**	Östergötland	Forssell (1872, p. 23)
1518	1.625	Uppland	Historiska handlingar 40:1 (1977, p. 20 onwards).
1518	2	Uppland	Handlingar rörande Helga lekamens gille II-IV, p. 92
1519	2	Uppland	Stockholms stads skottebok 1516–1525 (p. 119)
1525	2.5**	Östergötland	SDhk 38656
1529	2.25	Viborg	FMU 6478
1529	3		Sandbergska samlingen OO, f. 26
1529	4		Hildebrand (1894, vol I:2, p. 947)
1530	4		Räntekammarböcker vol 1, RA
1534	2.25	Västergötland	Hallenberg (1798, p. 127)

* Most likely mark gutnisk. 6 mark gutnisk \approx 1.5 mark örtug.

** Most likely expressed in mark danska. 2 mark danska = 1.5 mark örtug.

Table A3.10. *Exchange rate of the Hungarian gulden.*

Year	Hungarian gulden in öre	Region	Source
1489	72**	Småland	RA, lappkatalogen no. 92
1492	18	Uppland	Stockholms stads tänkeböcker 1492–1500 (p. 10)
1500	22	Uppland	Stockholms stads tänkeböcker 1492–1500 (p. 475)
1509	32.3		Forsell (1872, p. 23)
1512	32.4		Hildebrand (1894, vol I:2, p. 947)
1516	24	Uppland	Helga lekamens gille II–IV (pp. 46–7)
1527	76	Stockholm	Räntekammarböcker vol 1, RA
1529	36	Viborg	FMU 6478
1534	30	Västergötland	Hallenberg (1798, p. 127)
1538	40		Hallenberg (1798, p. 140)

** Expressed in öre gutnisk. 72 öre gutnisk = 18 Swedish öre.

Table A3.11. *Exchange rate of other gold units in öre.*

Year	Value in öre	Type of gold unit	Region	Source
1328	12	gold florin	Östergötland	Fritz and Bäärnhielm (1990, no. 135c)
1328	577	mark gold	Östergötland	Fritz and Bäärnhielm (1990, no. 135c)
1332–1334	12	gold florin		Fritz and Bäärnhielm (1990, no. 146)
1333	11.62	gold florin	Uppland	Fritz and Bäärnhielm (1990, no. 231a)
1334	10	gold florin		Fritz & Bäärnhielm (1990, nr 265b and Bilaga 7)
1363	1 gold florin = 0.2 mark silver Cologne weight		Uppland	Fritz and Bäärnhielm (1990, no. 1295)
1432	7 ¹ / ₃	gulden	Uppland	Örebro stads medeltidsurkunder 1 (1993, p. 19)
1432	7 ¹ / ₃	arnoldsk gyllen	Uppland	de Brun (1924, no. 390)
1434	16*	arnoldsk gyllen	Västergötland	SDhk 22089
1436	8	arnoldsk gyllen	Finland	FMU
1441	16.8	arnoldsk gyllen	Finland	Åbo domkyrkas svartbok no. 492
1449	7	arnoldsk gyllen	Finland	Åbo domkyrkas svartbok no. 551; refers to Åbo marks
1450	6.5	arnoldsk gyllen	Finland	Åbo domkyrkas svartbok no. 556; refers to Åbo marks
1453	6	light gulden	Uppland	1453-10-11 B.E. Hildebrands samlingar, vol. 5
1460	8	gulden	Uppland	Stockholms stads skottebok 1460–1468 (p. 2)
1492	6	arnoldsk gyllen	Uppland	KHL, 'Gyllen'
1510	20	gulden	Västmanland	Arboga stads tänkebok 3: 244
1520	20	gulden		Sandbergsska samlingen, O:1, f. 35

Table A3.11 (cont.). *Exchange rate of other gold units in öre.*

Year	Value in öre	Type of gold unit	Region	Source
1521	16	gulden	Uppland	Stockholms stads skottebok 1516–1525 (p. 195)
1526	12	gulden of Lübeck	Uppland	Stockholms stads tänkebok 1524–29 (p. 104)
1527	15	probably gulden of Lübeck	Uppland	Stockholms stads tänkebok 1524–29 (p. 235 n 1)
1535	15	probably gulden of Lübeck		Sandbergiska samlingen, O:1, f. 70
1538	15	probably gulden of Lübeck		Hallenberg (1798, p. 139)

* Probably expressed in öre gutnisk. 16 öre gutnisk \approx 7 Swedish öre.

Abbreviations

FMU: Finlands medeltidsurkunder.

KHL: Kulturhistoriskt lexikon för nordisk medeltid från vikingatid till reformationstid (1956–78).

RA: Riksarkivet, Stockholm.

SDhk: Svenskt diplomatariums huvudkartotek över medeltidsbrev.

SRP: *Svenska riks-arkivets pergamentsbrev*.

SS: Sandbergiska samlingen, RA.

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