6.
Foreign exchange rates 1804–1914

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6.1.   Introduction

This chapter presents foreign exchange rates in the 'long' 19th century (from 1804 up to the outbreak of the First World War in 1914). The account notes the types of exchange rate series that are included in the data base and the sources for those series. Obtaining long and reasonably homogeneous series entails dealing with matters such as some currencies being issued in different places at different times, the variety of the instruments that were traded at different times and the changing composition of exchange market participants. Another factor that needs to be taken into account is the integration of credit markets and associated foreign exchange markets. The way in which a number of these problems have been tackled is reported in this chapter. The new exchange rate data that this project has produced also pave the way for new analyses of the integration process. First, however, comes a summary of the development of foreign exchange policy and monetary regimes in the 19th century. The new monthly exchange rate series that are the fruit of this work turn out to be extremely suitable as a starting point for an analysis of the history of Sweden's monetary system in the 1800s.

6.2.   Exchange rates, foreign exchange policy and monetary regimes in the 19th century

Figure 6.1 shows monthly exchange rates on Hamburg and London, which for Sweden were the principal international financial centres in the 19th century.[1] A pronounced depreciation and large fluctuations in these exchange rates give way to

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1   Note that the exchange rates are expressed in terms of Swedish currency units per unit of the foreign currency. That was how exchange rates were expressed in Sweden in the 19th century. In this context, a 'rising *foreign* exchange rate' denotes a 'fall' or 'depreciation' of the Swedish currency and vice versa.

Figure 6.1 *Exchange rates with Hamburg (left scale) and London (right scale) 1804–1914*
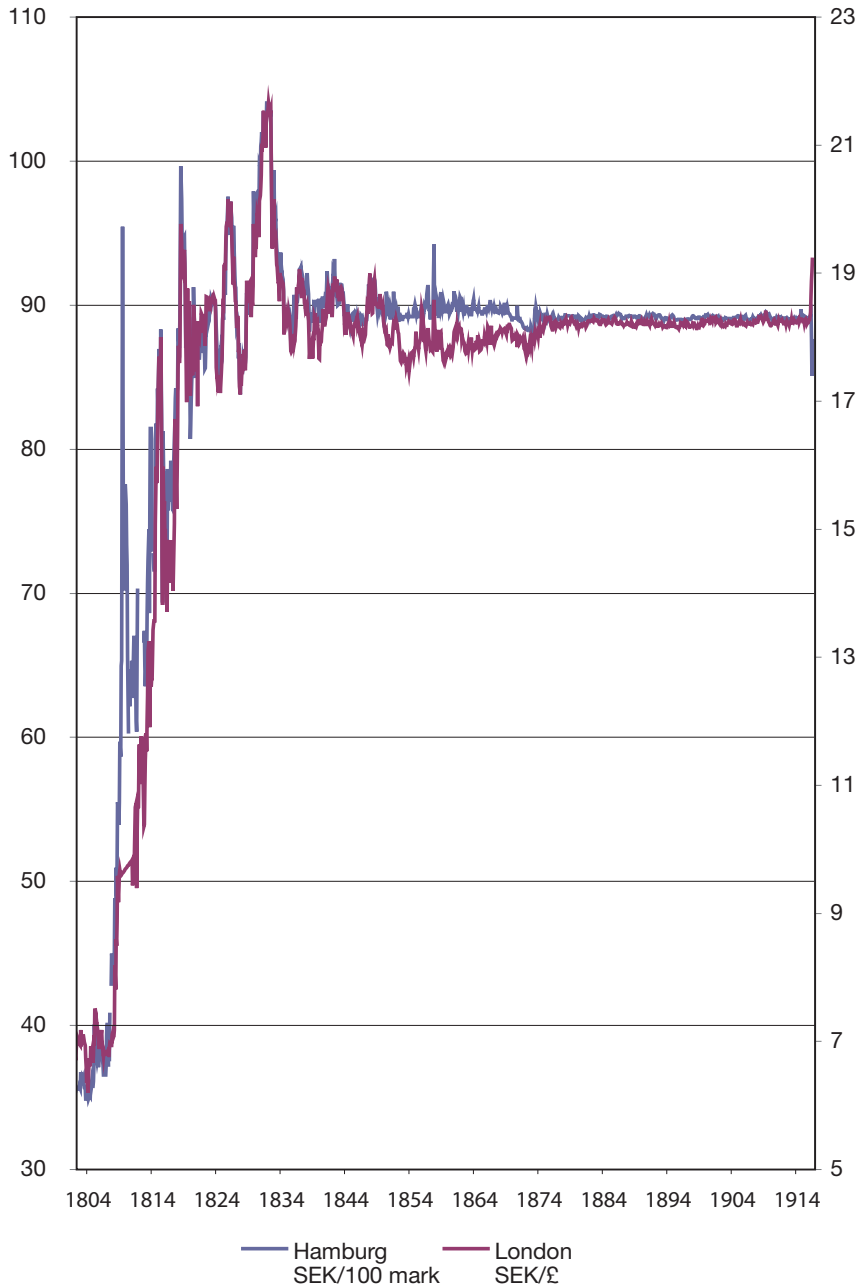
Source: Tables A6.1 and A6.2.

increasing stability that leads up to the international gold standard with its histori-cally exceptional exchange stability. Here we have a good illustration of what Eli Heckscher described as a transition from confusion and disorder to an orderly and harmonious monetary system.[2] Moreover, four fairly distinct periods are evident in the series. From 1803 to 1809 Sweden was on a silver standard. This was suspended in 1809 in connection with the war with Russia and the deposition of Gustav IV Adolf; the currency remained inconvertible until 1834 and Sweden was, in practice, on a paper standard. This was also the period with a marked depreciation. A cur-rency reform in September 1834 meant that bank notes could again be redeemed for silver. Sweden then remained on a silver standard until 1873, when this was replaced by a gold standard. These periods are considered in somewhat more detail below.

6.2.1. *The silver standard 1803–09*

At the turn of the 18th century Sweden was obliged to move to an inconvertible paper standard. The monetary system was based on a silver coin, riksdaler specie, but in 1789 excessive note issues denominated in riksdaler riksgälds in connection with the war with Russia had forced the Riksbank to suspend the redemption of notes for silver. Riksdaler riksgälds were issued by the National Debt Office (*Riksgäldskon-toret*) – side by side with the Riksbank's note issues in riksdaler banco and skilling banco – to enable the Crown to finance the war despite the intransigence of the Riksbank, which was controlled by the Riksdag[3]. Specie payments were resumed in 1803 (the 'realisation' of 1803) and notes could again be redeemed for silver. Mean-while, however, the period of inconvertibility had led to an agio of 50 per cent between the two paper currencies: riksdaler banco and riksdaler riksgälds. This neces-sitated a corresponding devaluation of riksdaler riksgälds.

The introduction of a silver or a gold standard had considerable implications for the workings of the foreign exchange market and for exchange rate movements. A paper currency based on silver[4], such as Sweden restored in 1803, meant that notes could be exchanged for silver coin and this tied the value of the paper currency to the silver coin. The exchange rate with another silver-based currency will then have a par-ity that is determined by the nominal value of the domestic currency expressed in sil-ver in relation to the nominal value of the foreign currency for the same amount of silver. However, this assumes a free exchange of silver between countries and in prac-tice this exchange is associated with transaction costs for commissions, insurance and transport, for example. Prices could therefore vary within certain limits before it became profitable to export/import silver to/from other countries with a silver stan-

2 Heckscher (1941).
3 The Diet of the Estates of the Realm up to 1866, then a bicameral parliament up to 1970, when parliament became unicameral.
4 Or any other precious metal or, for that matter, other commodities that are used as a stand-ard.

dard where the purchasing power of silver differed. These limits are known as silver points (more generally, commodity points). As a rule, however, neither coin nor precious metals were used for international foreign exchange transactions; these were arranged instead with bills of exchange (or drafts), which in the case of Sweden were almost exclusively drawn on foreign banks or bankers. For most of the period, the exchange rates shown in Figure 6.1 are actually the prices of foreign bills from exchange dealing on Swedish bourses. The silver points accordingly determined the limits of the exchange rate's deviations from parity, which in principle would have corresponded to transaction costs for silver. Rates above or below these points would have meant it was profitable to carry out foreign transactions in silver instead of in customary financial instruments, which at this time were primarily bills.[5] So as long as the domestic paper currency could be redeemed for silver and this silver could be used for foreign transactions, the exchange rate could neither fall below nor rise above the silver points.

At macro level, as we say today, the adjustment occurs in markets for goods as well as for money. One of the first to present a theoretical argument of this type was the 18th century philosopher David Hume, whose model for adjustment with a metallic standard is usually known as the 'price-specie flow mechanism'. In general terms, he asserted that the value of a country's coin is determined by the quantity of metallic currency in proportion to the output of goods and services (the quantity theory of money). If the proportion shifts, for instance because the quantity of money increases without a corresponding change in the amount of available goods, prices tend to rise, which is tantamount to a fall in the value of money. If money is worth less, it becomes profitable to import goods from countries where the purchasing power of the currency is unchanged. As the outflow of money to pay for the additional imports reduces the quantity of the domestic currency, the value of the currency will return to its equilibrium level. In other words, the domestic price level tends to fall to a level that is internationally competitive. Hume wanted to demonstrate the futility of the contemporary mercantilist ambition to maintain a trade surplus and build up a stock of bullion. He used an analogy with fluids to explain that trade and the money supply tend to find their own levels. His ideas were current in Sweden in the early 19th century but so were a number of other opinions about how the monetary system functioned with a silver standard.

At the time, the resumption of convertibility in 1803 was commonly regarded as a failure in that the National Debt Office's notes – which circulated alongside the Riksbank's notes and were responsible for the monetary expansion which had necessitated the paper standard – were devalued by 50 per cent relative to banco money. Even so, the currency performed comparatively satisfactorily in the years after the resumption. Figure 6.1 shows that in these years, fluctuations around parity for the

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5   A special case is silver point arbitrage, which uses exchange rate differentials and silver transactions with the sole aim of profiting from the spread between the silver point and the exchange rate.

exchange rates with Hamburg and London amounted to a few percentage points. Parity, or mint parity, in this context is the theoretical exchange rate expressed as units of domestic currency per foreign currency units equal in value to the same amount of silver. By 1807 the situation had changed; ongoing war and blockades on the Continent led to exchange market unrest, foreign exchange rates rose to the silver point and notes were converted into silver, mainly for export. This precarious situation was exacerbated by the war with Russia. Convertibility was maintained initially, notwithstanding large note issues, because British subsidies enabled the Riksbank to replenish its silver reserves.[6]

6.2.2. The suspension period 1809–34

The war and acute financial requirements after the deposition of Gustav IV Adolf led to greatly increased note issues in 1808–09. The ensuing inflation resulted in a combination of agio between banco and silver currency and growing pressure on Sweden's banco currency relative to the principal foreign currencies. Convertibility became increasingly restricted as the war proceeded and seems to have been suspended in practice in the final phase when the king was deposed and power passed to the Riksdag. An indication that this was the case is that exchange rates began to exceed the levels at which silver had been exported earlier, which suggests that the silver points had ceased to be effective. Convertibility was formally suspended in March 1810.[7]

With a paper standard unequivocally in place and ineffective silver points, exchange rates started to rise and then shot up in the winter of 1810/11. The huge initial depreciation can have been an instance of overshooting – the tendency for financial market participants in particular to generate excessive price movements.[8] The rates did fall back but the depreciation still amounted to as much as about 65 per cent in 1812. This was followed by a period of long-term depreciation, accompanied by considerable exchange rate fluctuations, for instance at the time of the campaign against Norway in 1817 and the British financial crisis in 1825. The depreciation occurred during the international recession in the wake of the Napoleonic wars, when there were also periods of international deflation. Post-war economic setbacks also hit Sweden, particularly Göteborg and the western region. It is possible, however, that deflation was less pronounced than in other countries and instead took the form of a marked depreciation of the currency.

The paper standard was by far the most important economic policy issue in the 1810s and '20s. The currency's depreciation, the agio between paper and silver money and the suspension of convertibility were frequently likened to a national bankruptcy

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6 Brisman (1931, p. 10).
7 Brisman (1931, pp. 9-16).
8 Cf. Dornbusch (1976).

in that the State could not meet its commitments (notes) with specie (silver). The large exchange rate fluctuations and the comparatively sizeable price movements during this period were attributed to this lack of confidence and were judged to be a serious impediment to economic development. On behalf of the Crown Prince (subsequently the King), on several occasions in these decades 'finance secretary' Skogman attempted to counter the depreciation and exchange rate fluctuations by means of extensive currency operations, to little or no avail.

While Sweden's exchange rates with the major international currencies, even the franc, increased dramatically after 1809, the exchange rates on Copenhagen declined spectacularly. Denmark was deeply involved in the continental conflict and the military effort was largely financed by issues of courant bank notes, which led to inflation and currency depreciation.[9] The force of the Danish depreciation between 1808 and 1813 is well illustrated by the dramatic decline against the Swedish currency, which was itself depreciating rapidly (see Figure 6.2).

The virtual collapse of the Danish courant currency necessitated far-reaching monetary reforms in Denmark. In 1813 the courant rigsdaler was replaced by a new rigsbankrigsdaler (or rigsbankdaler) at the rate of 6:1. The new currency was not convertible but nevertheless became more stable, at least in terms of Swedish currency. In 1818 the Danish Nationalbank was established and organised as an independent joint stock company in a further attempt to stabilise the monetary system.[10] Furthermore, the Nationalbank conducted contractive monetary policies in the 1820s and '30s in an attempt to accomplish a considerable appreciation of the rigsbankrigsdaler. As a result, between 1817 and 1834 the Danish currency appreciated considerably in terms of Swedish currency, from around 30 to about 100 SEK per 100 DKK.

The Swedish monetary reforms after the currency depreciation were not nearly as far-reaching as those in Denmark. During the 1820s, the Swedish depreciation against the major currencies was less marked, though the fluctuations remained considerable. This led the Riksdag to start a serious discussion about a new currency reform. By the Riksdag of 1822/23 it was increasingly recognised that the depreciation was an irrevocable fact. Unlike their colleagues in Denmark, Swedish politicians considered that the advantages of an appreciation of the banco currency were outweighed by the drawbacks because a monetary tightening could be economically harmful. In Britain, parliamentary debate in 1817 had resulted in a decision to implement a formal devaluation of sterling and resumption of specie payments in 1821. The path of the Swedish exchange rate against sterling in Figure 6.1 suggests that the Swedish depreciation went further than the British since the Swedish currency depreciated almost as much as against reichsthaler Hamburg banco, which was an ideal currency that could not depreciate in terms of silver. However, the Swedish

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9   Svendsen and Hansen (1968, pp. 84-99).
10   Svendsen and Hansen (1968, pp. 137-196).

Figure 6.2 *Exchange rates on Copenhagen (left scale), Paris (right scale) and Amsterdam (right scale) 1804–30*
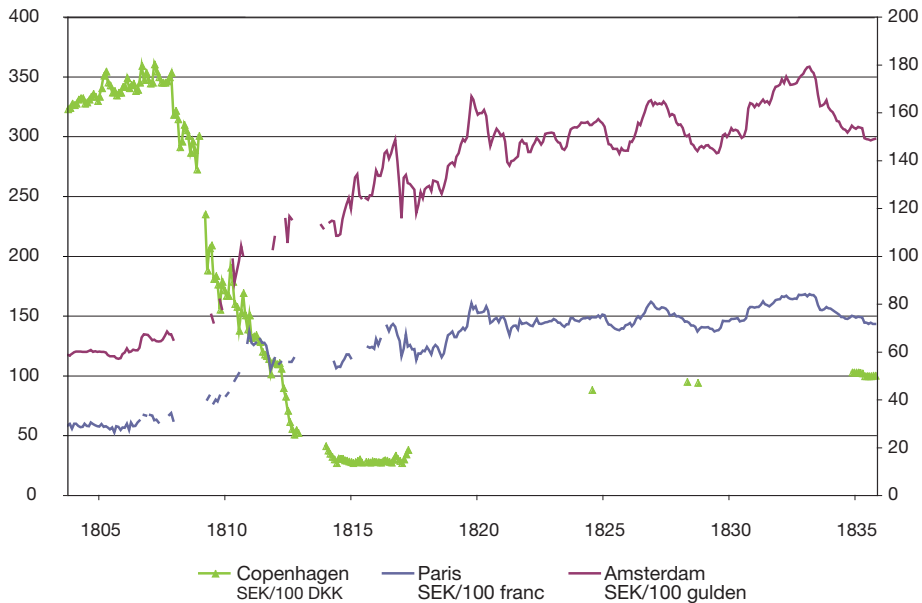
Source: Tables A6.3, A6.4 and A6.6.

Riksdag decided to put off a return to convertibility on the grounds that the Riksbank had not yet accumulated adequate reserves of silver. Another factor was the King's objection to a solution that involved devaluation; he continued to argue for an appreciation of the riskdaler note to its pre-war level.[11] The struggle between the Riksdag, where a majority favoured an official banco devaluation, and Karl XIV Johan continued throughout the decade. In the end, just as the session of 1828–30 was drawing to a close, the King relented; a law prescribing convertibility into silver and regulating the administration of the Riksbank was passed in March 1830. A resumption of specie payments in silver had to wait, however, until the next Riksdag had approved constitutional amendments in September 1834.

During the Riksdag of 1833–34 there was some concern that a resumption of silver payments would occasion a run on the Riksbank. That these fears were by no means unfounded is indicated by the marked increase in the exchange rate during the first half of the 1830s (Figure 6.1) in connection with the political disturbances on the Continent and Britain's financial crisis. If silver payments had been resumed when the exchange rate was highest, presumably the opportunities for arbitrage would have led to a major influx of notes and exports of silver. In September, how-

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11   See e.g. Andreen (1961).

ever, when convertibility was restored, exchange rates were on the way down and silver payments could be resumed without difficulty. The paper riksdaler had then depreciated to only 3/8ths of its earlier value against the silver riksdaler.

6.2.3.   The silver standard 1834–73

The Riksbank actually started to accept notes for silver in September 1834. The weight of riksdaler specie was reduced by approximately 0.1 grams to approximately 25.1 grams fine silver, while the paper currencies were officially written down from 1 till 2⅔ riksdaler banco, or from 48 to 128 skilling banco, per riksdaler specie. So there was a de facto devaluation of the Swedish paper currencies against foreign currencies, from c. 48 to 127.4 skilling banco per Hamburger reichsthaler banco. There was no fixed parity with sterling because since 1821 Britain had adopted a gold standard; as the price of silver fluctuates relative to the price of gold, no fixed parity could be calculated between these two metals. Exchange rates with the other Scandinavian currencies were calculated in Danish rigsdaler and Norwegian specie, on Amsterdam in Holländsk riksdaler kurant and on Paris in francs.

Following the resumption of silver payments, exchange rates became considerably more stable. The international economic recovery probably contributed to this but so did the credibility of the new monetary regime. The profound change that accompanied the return to a silver standard in 1834 is also evident from Figure 6.1. By vigorously defending the convertibility of the paper currency and naturally also thanks to Sweden not being directly involved in military conflicts, the Riksbank managed to maintain convertibility until the outbreak of the First World War. Exchange rate movements in this period were essentially limited by silver points at first, later by gold points.

The exchange rate fluctuations that continued to occur (see Figure 6.1) were connected as a rule with changing international economic conditions and largely remained within the range of the silver points. Prior to the First World War there was no lasting depreciation or appreciation, at least against other silver currencies such as the one in Hamburg. Britain, as mentioned, was on a gold standard both de facto and de jure from 1821. Some appreciation of the Swedish riksdaler against sterling can be discerned in Figures 6.1 and 6.3; presumably because the discovery of gold in California and Australia greatly increased the supply of gold and this affected the price of gold relative to silver. But there were no sizeable fluctuations or permanent depreciations or appreciations.

Otherwise, exchange rates in the period on a silver standard up to 1873 reflected two main tendencies. One was that with ongoing integration, transaction costs decreased over time and this led to a narrower range between the silver points. This long-term external integration is considered in more detail below. The other tendency was for exchange rate fluctuations to occur largely in the upper part of the range between the silver points. This is evident in the exchange rates from Paris,

Figure 6.3 *Foreign exchange rates during the silver standard 1834–73*

| Hamburg SEK/100 mark | Paris SEK/100 franc | Amsterdam SEK/100 gulden |
| Copenhagen SEK/100 Dkr | Christiania SEK/100 Nkr | London (Right scale) SEK/£ |
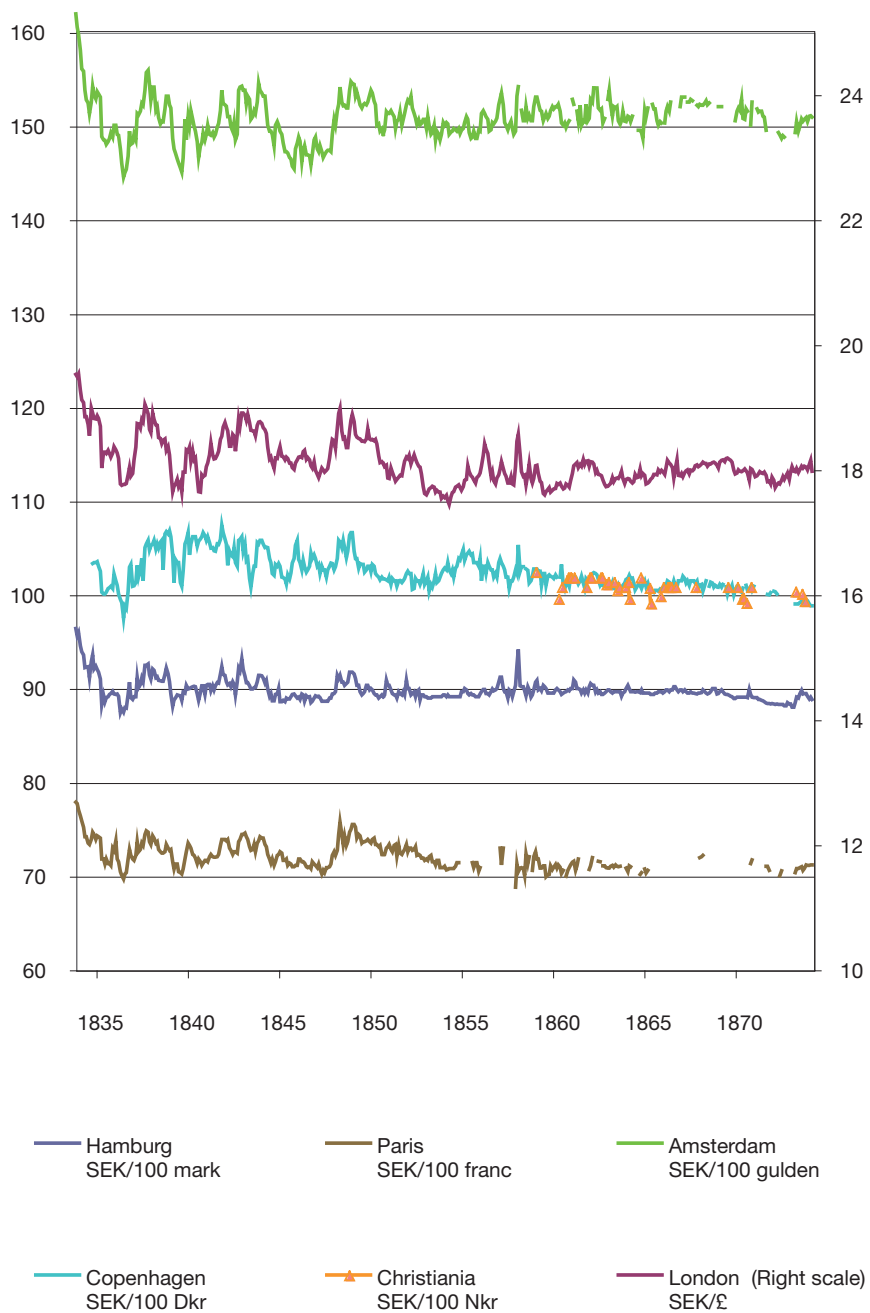
Source: Tables A6.1 to A6.8.

This 10-riksdaler riksmynt note from January 1873 was still redeemable for silver coins in the Riksbank, either 2.5 riksdaler specie (since 1 'riksdaler i silfwer' = 4 riksdaler riksmynt) or 20 'ort' (= 85 grams) silver of 12/16 fineness ('tolf-lödigt') in minted coins. 10 riksdaler riksmynt was, therefore, the equivalent of 64 grams of fine silver in minted coins. Sweden switched from a silver to a gold standard later that year, setting 1 krona (linked to gold) = 1 riksdaler riksmynt. See also the next illustration.
Photo: The Royal Coin Cabinet, Stockholm.

Copenhagen and Hamburg (see Figure 6.3) and could be evidence of some continuous pressure for a depreciation of Sweden's currency.

For Sweden, a typical international economic cycle went roughly as follows. International downturns weakened Swedish exports at the same time as the international credit market became less liquid because downturns were usually associated with credit crunches and financial crises of varying severity. This led to a diminishing supply of currency until the exchange rate had risen to the silver export point and it became profitable to use silver for foreign transactions instead of the conventional instruments, or even to practicing silver arbitrage. Silver exported in this way was

largely withdrawn from the Riksbank and most of it was shipped to Hamburg.[12] In that notes were redeemed for much the same amount, there was a domestic monetary squeeze and this limited the potential supply of credit from the Riksbank. Moreover, the revised version of the Riksbank's regulations, from 1844, required the board of directors to cancel credit to banks and the public when silver was exported (the Bank was still engaged in purely commercial transactions at this time). This was seldom done on a sizeable scale because to some extent the Riksbank could sterilise, or counter, a reduction of the money supply, for instance by using unexploited note-issuing rights or by supplementing its specie and bullion with foreign financial assets/drawing rights. On the whole, however, international downturns did result in a rather drastic tightening of the credit market due to direct reductions of the money supply and credit restrictions. Contemporaries referred to this as a *strypsystem* (literally: 'throttle system'). The pattern was repeated during the international economic downturns and crises around 1837, 1842/43, 1847 and 1857, and to a lesser degree during Britain's brief but intense financial crisis in 1866.

The pattern during economic recoveries was somewhat different. The Riksbank was generally short of silver and aimed to replenish the metallic reserves as soon as exchange rates had fallen back and the outflow of silver had ceased. But instead of waiting for increased exports and an improvement in international credit markets that would bring exchange rates close to the silver import point, making it profitable for people to import silver and deposit it in the Riksbank, the Bank itself set about importing silver when exchange rates were approaching their parities. By purchasing large amounts of foreign currency for this purpose, in practice the Riksbank created a floor for exchange rates at their par value, which was one reason why exchange rate fluctuations on Hamburg tended to stay in the upper part of the band.

The external shocks were considerable. During the depression after the crisis in 1837, for instance, Sweden lost a major part of its comparatively large exports of bar iron and an even larger share of more manufactured iron products to the United States. Another example, where the crisis was more financial than economic, was when the downturn that followed the boom during the Crimean war led to a sharp international financial crisis and a run on banks in 1857. The failure of the Ohio Life Insurance and Trust Company triggered a collapse of financial and credit markets, whereupon the panic spread across the world and even Hamburg banks, usually solvent and liquid, had to suspend payments.

The domestic macroeconomic adjustment effects of the cyclical external flows of silver were probably rather limited because economic conditions usually improved simultaneously for Sweden and for trading partners and credit markets abroad. More-

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12 Of course there were exceptions. In the 1840s, when a separate monetary system was established in what had become a Russian province, a stock of predominantly Swedish notes in Finland was redeemed for silver that was then exported. Meanwhile there was extensive arbitrage with the Riksbank's stock of Spanish piastres to Asia. Moreover, silver was exported to London towards the end of the period.

over, the Swedish economy was still predominantly agricultural and less affected by international fluctuations. But even in agriculture, a process of commercialisation and international integration was under way during the period with a silver standard.

However, this monetary regime, with the exchange rate as a central variable, meant on the whole that the long-term growth of the money supply in Sweden was determined by the international supply of and demand for silver. As a result, it probably helps to explain why no permanent currency depreciations occurred during the rest of the period up to 1914. The regime also lay behind the fact that during the four decades with a silver standard, the Riksbank made hardly any contribution to the increase in the money supply. Sweden's overall annual economic growth averaged rather more than 3 per cent (at current prices), which could be expected to have generated a corresponding increase in demand for money because it was not until the latter half of the century that the banking system and routine transactions became appreciably more up-to-date. With a largely unchanged money supply and a trendwise increase in demand, the monetary regime (in Sweden as well as internationally) should have had a deflationary effect.[13] However, the private banks helped to generate a long-term increase in the money supply and growing liquidity. They did so, not so much via the credit multiplier in the way that is usually understood, but by issuing notes based on their capital and reserves of the Riksbank's paper currency.[14]

The metric system was applied to Swedish currency in the second half of the 1850s. The new paper currency, riksdaler riksmynt, was subdivided into 100 öre. The ratio of new riksdaler riksmynt to old riksdaler banco was the same as for riksdaler riksgälds, i.e. 1.5:1. Moreover, the units in which exchange rates on Hamburg were quoted were changed so that the currency was reported in terms of Hamburger mark banco (3 Hamburger mark banco =1 Hamburger reichsthaler banco) and rates were expressed in riksdaler riksmynt per 100 Hamburger mark banco. Bills on Amsterdam were calculated in guilder as of 1858. The new exchange rate parities on Hamburg and Amsterdam were then c. 132.70 riksdaler riksmynt per 100 Hamburger mark banco, and c. 150.4 riksdaler riksmynt per 100 guilders.

6.2.4.   The gold standard 1873–1914

The creation of a universal international monetary system based on the French gold franc was discussed in earnest in the 1860s but the idea had to be shelved after the Franco-Prussian war of 1870–71. The indemnity which France, as the loser, had to pay Prussia served as a basis for the unification of Germany and a final amalgamation of German currency systems.[15] Germany's adoption of a gold standard was followed

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13 See e.g. McKinnon (1993).

14 Ögren (2006).

15 In 1871 there were still three different currencies in the territories that were to become Germany: the Prussian thaler, the Hamburger mark banco and the south-German gulden.

by Sweden and Denmark in 1873, when these two countries agreed on a common currency system, and in 1875 by Norway, which also joined what then became the Scandinavian Currency Union with the Scandinavian krona as the unit of account. The new exchange rate parities were 88.8888… kronor/100 marks with Germany, 72 kronor/100 francs with France and Belgium, which were both participating in the Latin Monetary Union, 18.1595 kronor/pound with Britain, and 149.9903 kronor/100 guilders with the Netherlands.

The krona was equivalent in value to the former riksdaler riksgälds and riksdaler riksmynt. New external parities were established and were fixed in practice both with sterling and quite soon with a growing number of other currencies as these were tied to gold during the emergence of the classic or international gold standard. The three countries in the Scandinavian Currency Union each retained their central bank and cooperated and coordinated their monetary and exchange rate policies. Still, the main reason why the Union worked so well for almost three decades was the gold standard, which imposed stringent restrictions on monetary policy as well as on economic policy in general. The resultant symmetry promoted currency harmonisation and the Union's long existence[16]. The Union's internal exchange rate parity was, of course, 1:1.

Under the 19th-century gold standard, exchange rates were notably stable (see Figure 6.4). One reason was that a gold standard cut the cost of transactions in gold compared with silver, with the result that gold points had a much smaller range than silver points. The band within which exchange rates could fluctuate without eliciting corrective arbitrage or transactions in gold became correspondingly narrower.

Note that this was by no means a period of financial and economic calm. Serious international financial crises occurred in 1874, 1890, 1903 and 1907, as did a more domestic Swedish financial crisis in 1878 and 1879. In the years up to 1889, moreover, there was a protracted recession with deflationary tendencies and this was followed in the 1890s by a lengthy international economic upswing with rising prices. The break in the international price trend is usually associated with an increased international supply of monetary gold as a consequence of the discovery of gold deposits in South Africa and Alaska, together with more efficient technology for extracting metals. The Swedish economy underwent extensive and profound changes that were accompanied by a massive import of capital, which sustained high long-term growth of both investment and consumption. But it also resulted in a long series of large current-account deficits. In that a stable exchange rate could be maintained for so long, the gold standard was no doubt an important factor behind the particular nature of Sweden's industrialisation.[17]

With Sweden on a gold standard, the operational aspects of monetary and exchange policy changed considerably. Convertibility into precious metal continued

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16 Talia 2004, pp. 201 onwards.
17 Schön (2007).

Figure 6.4 *Exchange rates during the gold standard 1873–1914*
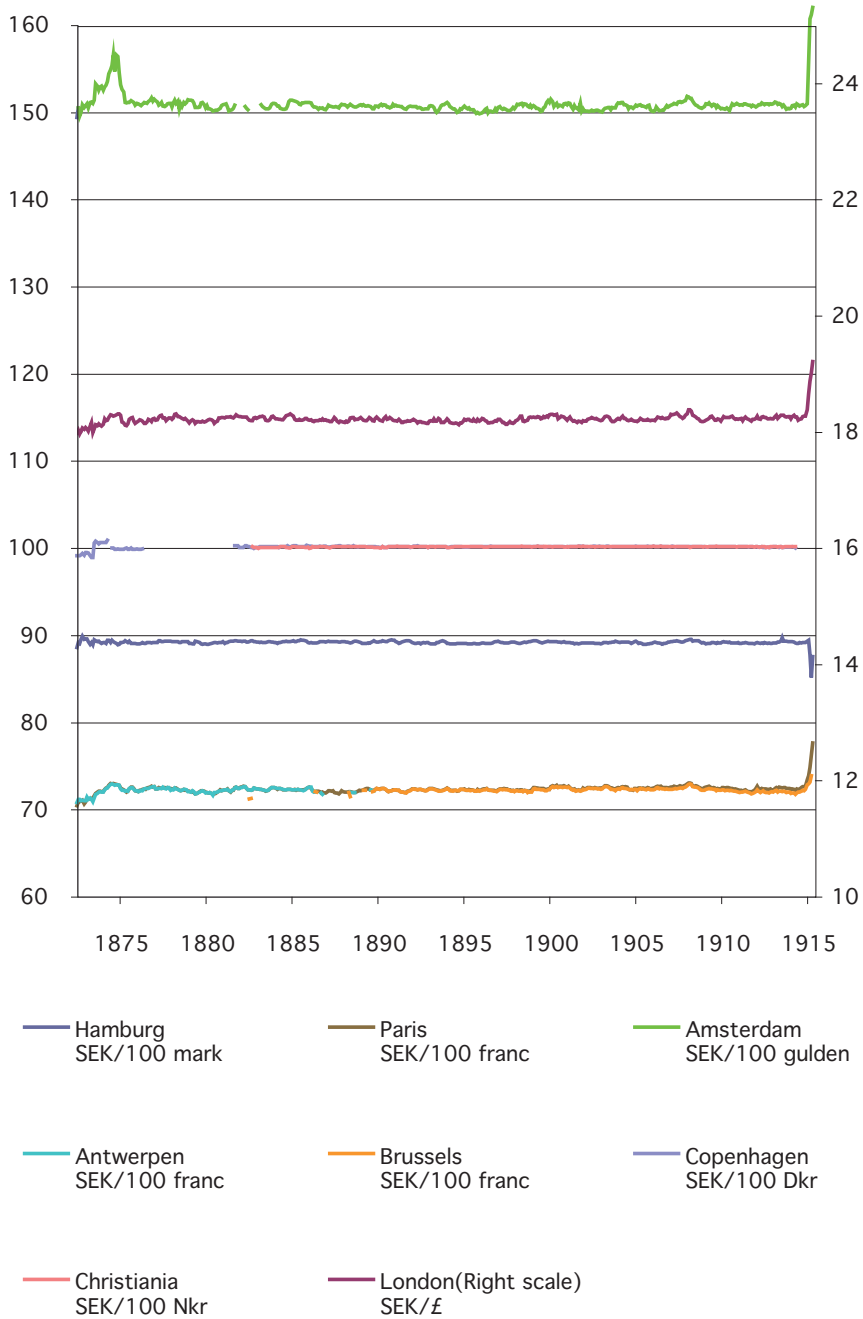
Source: Tables A6.1 to A6.8.

A 10-krona note from 1877, convertible into gold coins by the Riksbank. In the 1870s, 10 SEK was the equivalent of 4 grams of fine gold and corresponded to a male manufacturing labourer's pay for 40 to 50 hours' work. See also the previous illustration.
Photo: The Royal Coin Cabinet, Stockholm.

to be the Riksbank's overriding concern but the means for this were augmented, for instance by setting up operational functions. Two of the directors were designated 'delegates for foreign operations' with the task of managing foreign exchange policy. Moreover, the Bank began to trade in foreign currency to a growing extent, both with banks and with the general public.

Another important development was the Riksbank's increasingly well-prepared discount rate adjustments to conditions abroad and to the situation in exchange markets. The Bank had been experimenting with interest rate adjustments since the crisis of 1857. From 1864, moreover, an amendment to the usury law meant that interest rates ceased to be limited to maximum 6 per cent (see Figure 6.5).[18]

Interest rate adjustments and financial transactions accordingly replaced the regular earlier flows of precious metal, the Riksbank's redemption of banknotes and the

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18 Note, however, that this change only applied to interest on short-term credit/paper.

Figure 6.5. *The Riksbank: official discount rate 1828–1914*
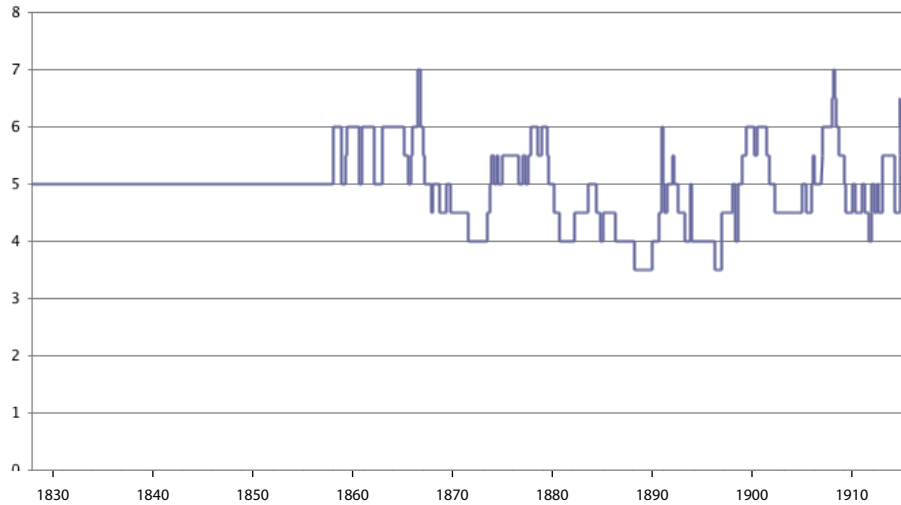
Source*: Sveriges Riksbank (1931) Del V. *Statistiska tabeller.*

effects of this on the credit market via the money supply as a mechanism for adjustment. Instead of constantly struggling to safeguard or replenish the silver reserves, the Bank was able to achieve an unbroken long-term accumulation of gold reserves and a corresponding growth of the money supply. The private banks' right to issue notes was finally withdrawn in 1902.

It should be born in mind that it was not until around the time of the transition to a gold standard that a number of preconditions for an efficient interest rate policy were in place. There had been a growing understanding of how interest rates and interest rate policy work; in the early 1860s this acquired a more scientific foundation, for instance through G. J. Goschen's *The Theory of the Foreign Exchanges*. Another factor, possibly the most important, was that both the financial system and the banking system in Sweden had not only become considerably larger and more developed but were also increasingly integrated internationally. It is worth considering whether an interest rate policy would have been at all meaningful or effective in earlier times when international liquidity was less abundant and financial flows may not have been sufficiently large to influence with interest rates.

Still, the above is not a sufficient explanation for the outstanding stability of exchange rates during the international gold standard. This is evident not least in a comparison with later decades of the 20th century (see e.g. the next chapter in this volume). So what is the explanation? One interpretation that has become influential is that the gold standard constituted a 'credible commitment mechanism'.[19] A firm

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19   Bordo and Kydland (1995).

and perhaps above all a historically long-term undertaking to maintain convertibility to precious metal sent a signal to financial market participants that, at least in peacetime, the State would not go to any extremes of either fiscal or monetary policy. This created confidence among international creditors and investors; moreover, the minimised exchange rate risk meant that credit was almost always available. Borrowers in turn could disregard exchange risks. Matters were probably not made worse by the fact that Sweden had managed to uphold convertibility to precious metal ever since September 1834.

6.3.   Market integration

During the 19th century the credit and foreign exchange markets in Sweden underwent an extensive and thorough transformation and integration. These processes are analysed in this section with reference to their possible importance for the concurrent development of foreign exchange rates. The new exchange rate series which the project has yielded can be used to both extend and deepen the analyses of long-term integration. The significance of integration for the level of silver and gold points is analysed and thereby the changes in this period in the range formed by these points. This is followed by a study of how the transformation and integration of the Swedish credit and financial markets can be related to the process of integration. The section ends with a look at the development of integration related to the Scandinavian Currency Union.

6.3.1.   Silver and gold points

Sweden's foreign exchange market was affected, as mentioned, by an ongoing integration during the periods with a silver or gold standard. This integration can be connected to some extent with innovations in transport and falling transport costs but what helped above all to lower transaction costs was decreased costs for commissions, brokerage, insurance and so on. In that the relative level of transaction costs determined the levels of silver and gold points, over time the range within which exchange rates could fluctuate without eliciting silver or gold arbitrage became narrower. In this way, integration contributed to a long-term stabilisation of exchange rates.[20]

Initially, moreover, the level of silver points varied seasonally because shipping was the cheapest form of transport for silver transactions. Transaction costs were therefore higher during the winter because shipping became ice-bound; this meant that the distance between the silver points widened. In time, this variation diminished as new forms of transport, above all the construction of railways, reduced the cost of moving silver by land, a practice that in those days was not as dependent on seasonal conditions as shipping. The seasonal variation in exchange rates seems to have largely

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20   Lobell (2000, 2006).

ceased during the 1860s. Another factor was that during the 19th century Sweden's foreign trade became increasingly diversified and less dependent on seasonal conditions.

Integration led, for example, to falling transaction costs for foreign arbitrage and transactions in silver and gold, which led in turn to a narrowing of the range between silver or gold points and thereby contributed to increasing exchange rate stability. This tendency in the period 1834–80 has been analysed earlier in Lobell (2000, 2006). The Riksbank's new Historical Monetary Statistics now permit new indirect observations of market integration in the period from 1807/08 to 1834.

One approach to estimating costs for transactions and arbitrage involves observing the level of exchange rates in periods when we know that silver or gold was exported. This assumes that normal means of payment, i.e. foreign bills, and silver were substitutes, so that silver could be used when the exchange rate reached a level at which it became profitable to use silver for foreign transactions despite the above-mentioned additional costs. Given also that the market was efficient, the exchange rate ought not to exceed the silver point, in which case the prevailing rate when silver was actually exported should in practice represent the silver point. Transaction costs are then calculated as the difference between exchange parity and the implicit silver or gold point.

Comparisons between direct and indirect measurements of transaction costs have shown fairly good agreement for the period 1834–80. In this case, the average exchange rate for the shipping season was used as an indirect measure. In the work mentioned above, export statistics for silver and gold from the Board of Trade (*Kommerskollegium*) served as an indicator of the years in which precious metal was exported; for the early 19th century one has to rely on indirect information from the Riksbank in Brisman (1930, pp. 8–9). Brisman states, as mentioned above, that silver was withdrawn from the Riksbank and exported at least in 1807. The average exchange rate for the period from April to October would then constitute a measure of the silver export point's level in that year. The new observation is presented in Table 6.1 together with data from Lobell (2006, p. 316). The silver export points refer to exchange rates on Hamburg (which received virtually all the monetary silver that was exported) and are expressed as a percentage of the exchange rate parity.

The figures in Table 6.1 indicate that between the end of the 1830s and the mid 1870s, transaction costs decreased from about two per cent to about half of one per cent of parity. It seems that this fall was preceded by a much steeper reduction since 1807, when transaction costs for exporting silver apparently amounted to more than thirteen per cent of parity. This is not entirely unreasonable in view of the situation in 1807, when the Continent was embroiled in war and blockades. In a study of the integration of Anglo-American foreign exchange markets, Officer (1996, pp. 182–185) demonstrated that transaction costs fell markedly between the periods 1791–1800 and 1821–30. From the present material it is not possible to conclude whether or not the above-mentioned reduction of costs for transactions between Sweden and the Continent occurred between the same periods but it does not seem improbable.

Table 6.1. *Average exchange rate for the shipping season in years when specie and bullion were exported (deviation from mint parity, per cent)*

Year	Average exchange rate	Year	Average exchange rate	Year	Average exchange rate	Year	Average exchange rate
1807	13.1						
1837	1.8	1848	2.6	1859	1.3	1870	..
1838	2.3	1849	..	1860	..	1871	..
1839	..	1850	..	1861	1.2	1872	..
1840	..	1851	..	1862	..	1873	..
1841	..	1852	..	1863	1.0	1874	..
1842	1.5	1853	..	1864	..	1875	0.4[**]
1843	1.5	1854	..	1865	..	1876	..
1844	1.7[*]	1855	..	1866	1.4	1877	..
1845	..	1856	1.2	1867	0.9	1878	..
1846	..	1857	1.2	1868	1.1	1879	..
1847	..	1858	..	1869	0.5	1880	..

[*] This figure is from observations by Skogman (1846).

[**] This figure denotes the average of exchange rates between September 1874 and April 1875.

Sources: Data for 1807 and 1808 are calculations from exchange rates on Hamburg in database *Historical Monetary Statistics of Sweden 1668–2008*, Sveriges Riksbank. Data between 1837 and 1880 are from Lobell (2006).

6.3.2.   The Swedish financial system and foreign exchange market

In the first half of the 19th century the major part of Swedish foreign exchange transactions was associated with the sizeable merchant bankers in Stockholm and Göteborg.[21] Their operations included goods, credit, transport and foreign exchange. They were a direct source of foreign currency to clients but foreign exchange trading was largely a matter for the exchanges in the principal towns. Until the end of the 1870s the Swedish foreign exchange market was centred on these exchanges. Swedish exchange trading in the 19th century was dominated by bills drawn on Hamburg and London, which for Sweden were the most important international commercial and financial centres.[22] In the present context, foreign exchange rates are the foreign bill prices that were set in the exchanges' auctions up to the end of 1889. [23]

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21 See e.g. Fridlizius (1981, p. 417), Söderlund (1964, p. 45), Andersson (2007).

22 Lobell (2000, p. 144).

23 Auctions were held on two days each week when the items traded were largely goods, foreign currency and maritime insurance. Certain brokers were appointed to perform the auctions, which lasted for one hour (see Algott 1963).

The role of banking companies in the foreign exchange market was very modest in the first half of the century. Three private banks (discount companies) were established in 1803, in Stockholm, Göteborg and Malmö, but they all failed during the international post-war crisis of 1817. The first savings banks appeared in the 1820s, followed by the first private banks and mortgage institutions in 1830 and 1833, respectively. As a rule, however, the note-issuing banking companies did not trade in foreign exchange until around 1860.[24] Moreover, the rudimentary nature of Swedish credit instruments and the difficulties in promoting operations in domestic bills made Swedish commercial paper less attractive internationally.

Exchange market liquidity was rather unstable in the first half of the 19th century. It varied seasonally and was affected by the above-mentioned international credit market conditions. Bills on Hamburg and London were the most important currencies on the Swedish exchanges and bills in other currencies were traded less frequently. This is reflected in the correspondingly large gaps in the exchange rate quotations for these currencies in the present database. During the boom in the 1850s, however, new participants and practices caused the international credit and foreign exchange markets to expand and change. Besides expanding, it has been shown that the foreign exchange market became more sophisticated, though the financial bubble that accompanied this did come to a disastrous end in the crisis of 1857.[25]

In banking, deposits and cash transactions got under way in the 1850s and made a breakthrough in the 1860s. In the 1850s the banks also began to discount domestic bills, albeit on a very modest scale; discounting caught on, however, in the 1860s as the number of banks increased and the banking system became more widespread. Meanwhile the Swedish banks were becoming more integrated internationally. The growth of international interbank trading in the 1860s included the Swedish banking system and helped to improve the liquidity and elasticity of the international foreign exchange market. At the turn of the century, foreign exchange transactions had left the exchanges and become a natural part of banking operations. The exchanges in turn were in the process of becoming stock exchanges.

The Riksbank was active in the foreign exchange market from time to time in the period with a silver standard. The Bank sold foreign currency when the foreign exchange rates were approaching the silver export point; but as the Bank's foreign assets and drawing rights were comparatively small, its sales were relatively insignificant up to the end of the 1880s. The Bank's purchases of foreign currency in connection with imports of bullion were probably more extensive.[26] The Riksbank began to trade in foreign exchange on a regular basis in 1872; in the 1880s the Bank became the central player in the Swedish interbank and foreign exchange markets.[27] As a

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24 Brisman (1937, pp. 186–7).
25 Einzig (1962).
26 Lobell (2000).
27 Brisman (1931, p. 285, p. 222).

result, the Riksbank's official exchange rates served as a benchmark for the Swedish market; the Bank's rates are included in the database as of 1890.

The Riksbank's exchange rates were presumably adapted to the market rates. In a statement in 1911 about how exchange rates changed increasingly frequently, the Bank's principal delegate, Bror Karl Johan Langenskiöld, described how foreign currencies were priced. His account shows that the Bank set exchange rates on the basis of information cabled from foreign markets. It seems that banks in Sweden normally followed the Riksbank's exchange rates. Langenskiöld related that commercial banks could obtain information about exchange rates from the Riksbank by telephone or by messenger.[28]

Together with innovations in transportation and communication, this qualitative transformation and development of the Swedish credit and foreign exchange markets contributed, as we saw in the previous section, to both the internal and the international integration of the Swedish foreign exchange market. One way of measuring this integration involves studying the development of price differentials for equivalent financial assets at geographically separate markets. In perfectly integrated markets that conform to the law of one price, prices should be completely uniform. The integration of the Swedish foreign exchange market is illustrated below in terms of a one-year moving average of daily price differentials for three-month bills on London between the exchanges in Stockholm and Göteborg from 1843 (when the Göteborg exchange was established) to 1880. Thus, instead of the silver or gold points that were used to study external integration and the resultant exchange rate band, a somewhat different type of commodity points (or rather 'three-month sterling bill points') is employed in this analysis of the internal integration of the Swedish credit and foreign exchange markets. The price differentials comprise both positive and negative deviations from the price of rather homogeneous three-month sterling bills on London. The more or less continuous falling trend for the mean as well as the standard deviation (see Figure 6.6) indicates a correspondingly continuous rate of integration of the Swedish foreign exchange market and presumably of the Swedish financial system as a whole.

6.3.3. The Scandinavian Currency Union

By the time the Swedish financial system had undergone this expansion, transformation and integration, conditions had also been created for making Swedish paper internationally acceptable on an entirely new scale. Short Swedish paper began to be quoted regularly abroad, starting with St. Petersburg in 1878. As of 1882, Swedish bills were also being listed in the major international financial centres. Previously, apart of course from Swedish specie, only Swedish notes had been listed on the Copenhagen and Hamburg exchanges and virtually all the Swedish bonds that were

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28 Riksbank archives: F1A:3.

Figure 6.6. *One-year moving average of daily market quotations 1843–80. Mean and standard deviation of absolute price differentials between the Stockholm and Göteborg exchanges (SEK/pound sterling). (Moving sample: n=104) (Log scale)*
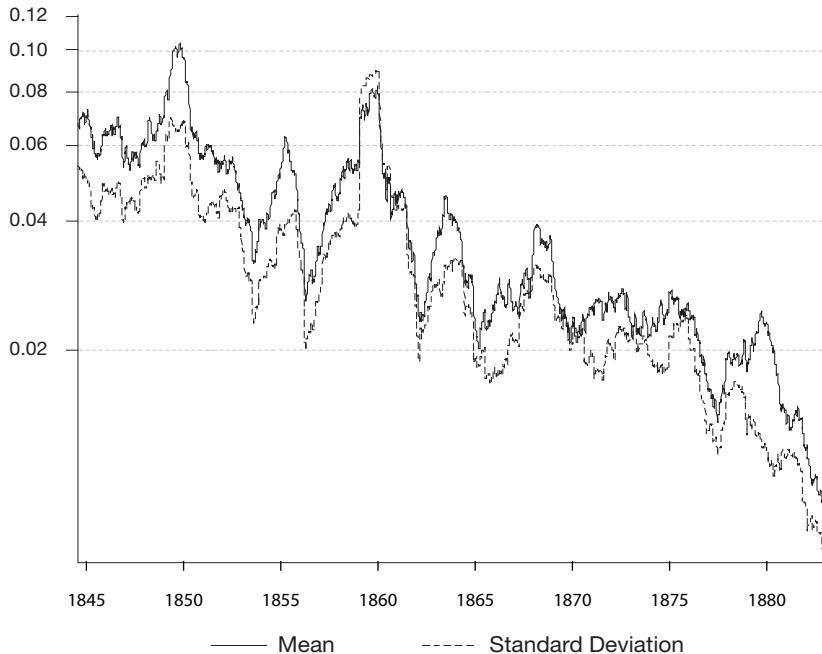
Note. The x-axis indicates the month and year of the last observation in 52-week series (104 trading days). Thus, the first observation concerns 104 price differentials in the period from 3 January 1843 to 2 January 1844.
Source: Modified from Lobell (2000, p. 161).

traded abroad had been made out in foreign currency. From the 1880s onwards, bonds denominated in Swedish currency were marketable internationally. The stable currency based on gold and membership of the Scandinavian Currency Union were naturally no less important in this respect.

Talia (2004, pp. 135–153) has shown that the Scandinavian Currency Union and, perhaps above all, the Union's clearing agreement in the late 1880s promoted the integration of foreign exchange markets in Scandinavia. The present project's new data with Scandinavian bill prices from Hamburg confirm Talia's observations in that they show that certain small price deviations occurred initially but became even smaller over time (see Figure 6.7).

A more unexpected finding is that the Hamburg exchange rate quotations for Scandinavian currencies show a slightly rising trend over as much as fifteen to twenty years, which has not been noted earlier for exchange rates under the gold standard. A

Figure 6.7. *Exchange rates for Scandinavian bills of exchange in Hamburg Börse (Copenhagen, Stockholm, Christiania) and German bills in Stockholm 1882–1913 (Hamburg/Berlin) (mark/100 kronor)*
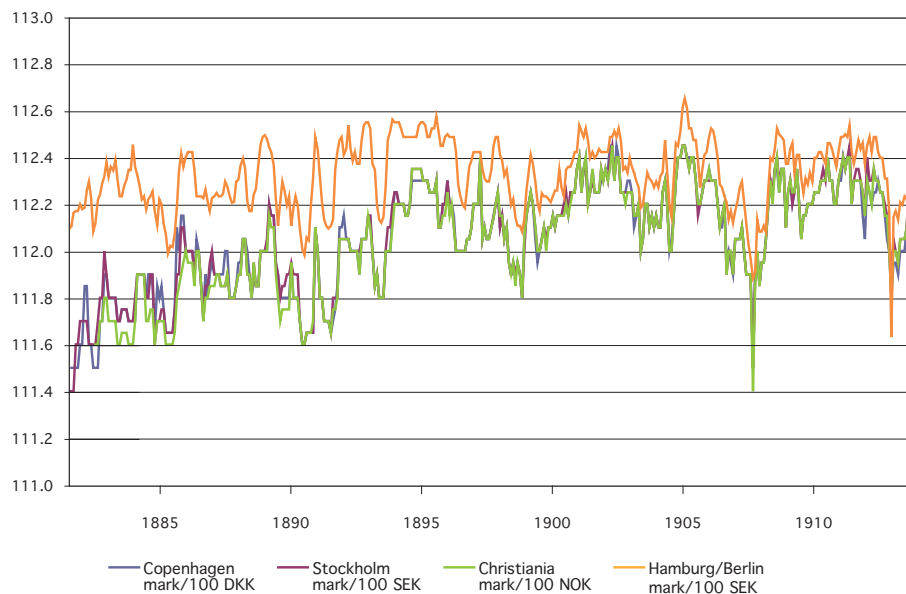
Source: See the main text.

comparison of Hamburg bid prices for Scandinavian bills with prices for bills drawn on Hamburg/Berlin and priced in Stockholm, which show no trend, reveals a price differential that diminishes in the long run. There still seems to have been some price differential at the outbreak of the First World War.

The price differential amounted at most to c. 0.7 per cent of parity; the most probable explanation is that it represented a risk premium which presumably concerned two circumstances. One part of the premium can relate to uncertainty about how the Currency Union and the gold standard would succeed in the Scandinavian countries. The other part can be due to the international markets still being somewhat sceptical about Scandinavian bills of exchange which, as mentioned, had been introduced on the internationally more important exchanges as recently as 1882.

6.4. Exchange rate data 1804–1914: description and sources

Foreign exchange rates in the 19th century were actually prices for foreign bills of exchange. Most of the trading from which the price information in this project has been obtained was done on the exchanges. The Swedish centres for the foreign exchange market, at least up to the 1870s, were the Stockholm exchange and, from

its establishment in 1842, the exchange in Göteborg. Trade in Swedish bills in finan-cial centres abroad started as late as in 1882. On the Stockholm exchange, foreign bills were traded on Tuesdays and Fridays.

The market quotations for bills on the Stockholm exchange have been obtained from two daily newspapers: *Aftonbladet* and *Post- och Inrikes Tidningar*. Market quo-tations were published regularly by local newspapers. The underlying data cover almost all trading days (i.e. two per week) from 1800 to 1889. Another source is the manuscript for the fifth, statistical volume for the history of the Riksbank that was published in 1931.[29] Information from the manuscript has been used mainly for the periods 1800–34 and 1881–89. However, a note on sources in the above-mentioned volume makes it clear that the daily newspaper *Post- och Inrikes Tidningar* was also the basis for those statistics.[30]

As mentioned in the previous section, the trade practices and the way in which foreign exchange rates were quoted changed in the latter part of the century. The vol-ume of interbank trading and the Riksbank's trading gradually outweighed exchange trading as the period drew to a close. For the period 1890–1914 the exchange rates in this database are the Riksbank's and have been compiled from the Bank's internal documents.

6.4.1.   Sight rates and time bills

Assembling 19th century exchange rate data is not entirely straightforward. The actual rate of exchange is our concern but as bills are financial instruments, their prices sometimes include other components besides the 'true' exchange rate. In the first half of the century, market quotations for foreign bills were based on usance or a time perspective, which means that the calculation of an actual sight exchange rate has to allow for trade practices and time to maturity. Prior to 1847, bills on the Hamburg exchange, for example, usually had 67 days to maturity.

Foreign bills were normally priced with a discount for the time to maturity. How-ever, the sight rate for a sight bill, E_s, can be derived by simply cancelling the discount on a time bill, E_d. Take, for example, time bill E_d with d days to the due date, where the interest rate at the financial centre where the bill was made out is given by i:

$$E_s = \frac{E_d}{1 - \left(\dfrac{i}{100}\right)\left(\dfrac{d}{365}\right)} \tag{1}$$

Eliminating the discount gives bill rates that are closer to the 'true' exchange rates. In this study, interest rate series from the financial centres where the bills were made

29   Sveriges Riksbank (1931).
30   Sveriges Riksbank (1931, p. 142).

out have served as a basis for calculating sight or 'true' exchange rates in accordance with equation 1. The interest rate series from London for the period 1836–80 is 'Minimum Rate of Discount, Bank of England' and comes from NBER online Macro History Database (http://www.nber.org), which is based in turn on information from *The Economist*. The interest rate series from Hamburg for the period 1824–52 is 'Discount an der Hamburger Börse' from Soetbeer (1855, p. 125) and is based on calculations of monthly averages using O. C. Gaedechen's annotations. However, monthly interest rate data for Hamburg and London are missing for the period 1804–23 as well as for 1835, and for Paris for the period 1804–53. A standardised rate of five per cent has then been used instead. The figure is not simply guesswork. In a book on the credit market, J. J. Nordström (1853, p. 161), head of the national archives and subsequently bank inspector, stated that this was a common procedure for discounting maturity periods at the Stockholm exchange in the mid-19th century. It could be argued that this approach should also be adopted for the period to which Nordström refers. The foreign exchange historian Paul Einzig (1962, p. 175) has claimed, as mentioned, that the foreign exchange market became more 'refined' in the mid-19th century, which meant that more consideration was paid to maturity periods, postal days, grace periods, etc.[31] In our opinion, however, as there are no grounds for assuming that, in practice, calculations were invariably done in this way, it is preferable to use the actual discount rate whenever this is available. It should be noted, though, that there is no direct evidence to show that five per cent was used as a standard rate in the early part of the 19th century.

There has been no elimination of the discount for time bills on Amsterdam and Copenhagen during the periods 1804–52 and 1804–34, respectively, since there is insufficient information on maturity periods.

An exchange rate series from which discounting has been eliminated is presented in Figure 6.8. It represents the difference between a series of time bill quotations and a series of estimated quotations of sight rates in the period 1834–52.

For the latter part of the 19th century, quotations are available for both sight and time bills, which makes it possible to compare the 'accuracy' of the sight rate calculations. Actual sight rates are compared in Figure 6.9 with rates that were reconstructed by applying equation 1 above. The results show fairly good agreement in terms of the level of the series and its medium- and long-term variation.

Table 6.2 *Correlation between first differences for unprocessed, reconstructed and original series 1870–80*

	3-month	Sight or short sight	**Calculated**
3-month	1.00	0.69	0.54
Sight or short sight	0.69	1.00	0.54
Calculated	0.54	0.54	1.00

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31 Note that postal days and grace periods are not considered in the present calculations.

Figure 6.8 *An original series compared with a series with discounting eliminated (skilling banco per reichsthaler Hamburg banco)*
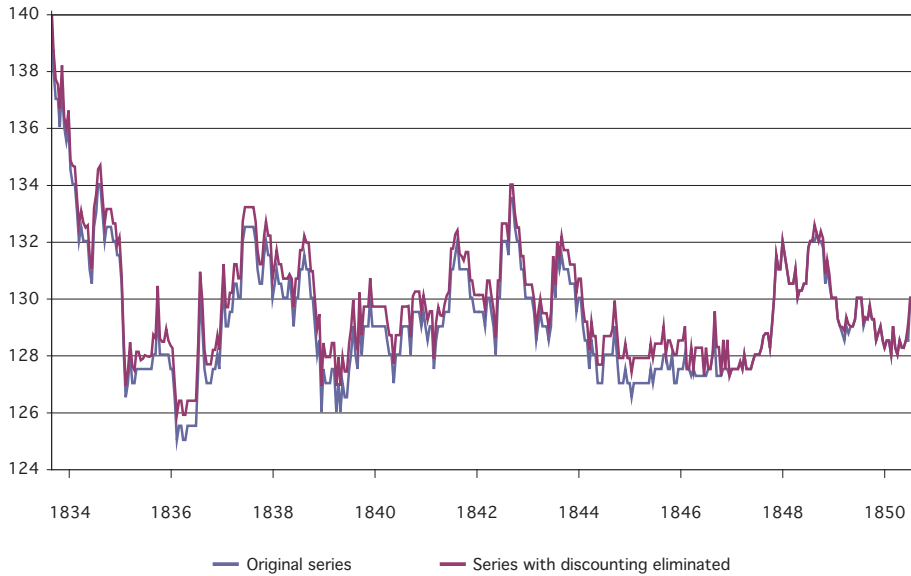
Source: See the main text.

Figure 6.9 *Comparison of a reconstructed and an original series of sight rates 1870–80 (SEK/£)*
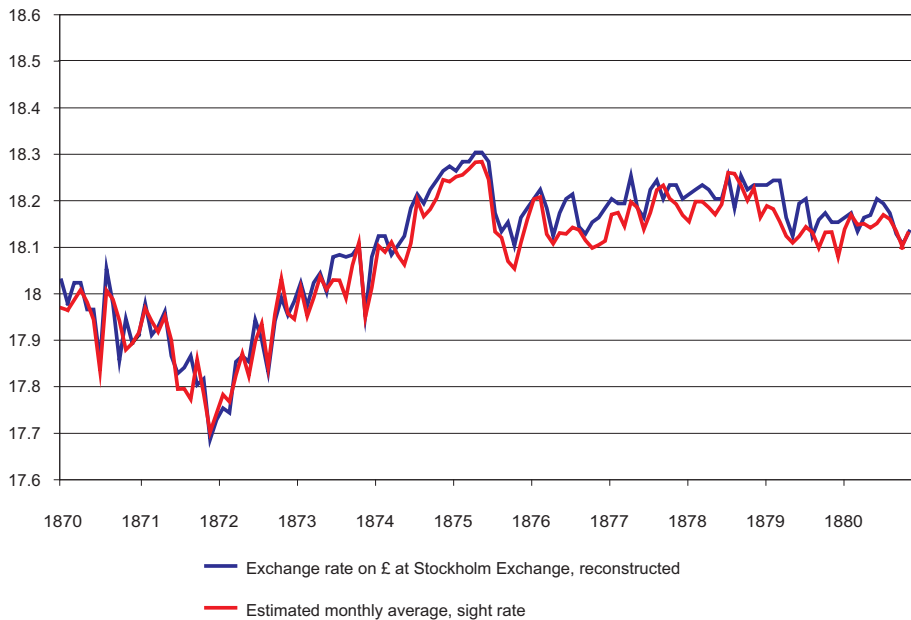
Source: See the main text.

There is some difference, on the other hand, in the pattern of short-term variations. This is even clearer in a more thorough comparison of the short-term (monthly) changes in the reconstructed and the 'actual' exchange rates. From Table 6.2 it will be seen that the first differences of the unprocessed series for 3-month and sight rates are more closely correlated than those of the reconstructed series.

Appendix A6.1 Quotations on Hamburg and Hamburg/Berlin

The currency units that were most important for the Swedish foreign exchange market as regards quotations on Hamburg and Hamburg/Berlin changed a few times during the period and have been converted into consistent series of SEK per 100 marks. Between 1804 and 1857, quotations on Hamburg were made in skilling banco per reichsthaler Hamburg banco; from 1858 to 1872 they were made in riksdaler riksmynt per 100 marks Hamburg banco and between 1873 and 1914 in kronor per 100 marks (in some instances referred to as riksmark or reichsmark). Conversions into SEK/100 marks have been done on the basis of 1 reichsthaler Hamburg banco = 3 marks Hamburg banco = 4.5 marks[32] and 1 SEK = 1 riksdaler riksmynt = 32 skilling banco and 1 riksdaler banco = 48 skilling banco = 1.5 riksdaler riksgälds = 1.5 SEK.[33]

Quotations during the period 1804–89 are from the Stockholm stock exchange, while the Riksbank's official quotations are used for the period 1890–1914.

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32 The exact conversion rate in the transition period 1871–76 between mark Hamburg banco and mark is not entirely clear in the literature. K.A.W. (probably the banker Knut Wallenberg) writes, for example, in the encyclopedia *Nordisk familjebok* (1911, p. 995) that mark banco (of Hamburg and Altona) had a value somewhat above 1.50 reichsmark.

33 For example, in order to convert 128 skilling banco into kronor (or riksdaler riksgälds or riksdaler riksmynt) the figure in skillings is divided by 32 (128 ÷ 32 = 4 kronor), and to convert 128 skilling banco into riksdaler banco the figure in skillings is divided by 48 (128 ÷ 48 = 2 2/3 riksdaler banco [or 2 riksdaler banco and 32 skilling banco]). Thus, to convert for example 50 kronor in order to obtain skilling banco the figure in kronor is multiplied by 32 (50 × 32 = 1600 skilling banco), or into riksdaler banco by dividing it with 1.5 (50 ÷ 1.5 = 33 1/3 riksdaler banco [or 33 riksdaler banco and 16 skilling banco]).

Accordingly, if an exchange rate for example in August 1846, 89 SEK per 100 mark, is converted to obtain the original rate expressed in skilling banco per reichsthaler Hamburg banco, one may multiply the numerator, the rate in SEK, with 32 to obtain skilling banco, and divide marks with 4.5 to obtain reichsthaler Hamburg banco in the denominator, and finally divide the rate with 100:

$$\frac{\left[\dfrac{(89 \times 32)}{\left(\dfrac{1}{4.5}\right)}\right]}{100} = \frac{12816}{100} = 128.16 \text{ skilling banco per reichsthaler Hamburg banco}$$

The Harbour of Hamburg, *by Anders Zorn (1860–1920). Bills on Hamburg were the most quoted foreign currency in Sweden in the first half of the 19th century.*
Source: Nationalmuseum.

Observations are monthly mid-range in the periods 1804–33 and 1881–89, end-of-month 1834–80 and monthly average 1890–14. The sources for the periods 1804–33 and 1881–89 are unpublished tables that most likely were the basis for calculations for the fifth, statistical volume in Sveriges Riksbank (1931); daily newspapers are reported to be the sources in that volume. Daily newspapers (mostly *Post och inrikes tidningar* and *Aftonbladet*) are sources for Hamburg quotations in the period 1834–80. Official Riksbank quotations on 'Hamburg/Berlin' 1890–1914 are from unpublished material in the Bank.

Quotations are short sight for the period 1848–80 and sight for 1881–1914. The primary instruments traded on the Stockholm stock exchange between 1804 and 1847 were 67-day bills drawn on Hamburg. Consequently the discount embedded in the prices has to be added in order to obtain exchange rates short sight or sight. The exact calculations and data sources are presented in the previous section of this chapter.

Table A6.1. *Monthly exchange rates on Hamburg. SEK per 100 marks 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1804	35.31	35.31	35.48	35.57	35.48	35.57	35.57	35.48	35.66	35.48	36.62	36.27
1805	36.18	36.36	36.18	36.27	35.83	35.57	35.48	34.78	34.78	34.87	35.22	35.04
1806	34.78	34.87	35.04	34.96	35.92	35.66	35.92	35.66	35.66	36.01	37.15	39.95
1807	39.07	39.25	37.67	37.67	37.41	37.85	36.97	37.41	38.37	38.37	39.42	38.90
1808	38.37	37.76	37.15	36.45	36.45	36.45	36.45	36.45	37.15	39.25	39.95	39.95
1809	37.15		37.50	40.65		42.75	44.86	44.33	43.63	44.27	44.16	45.03
1810	48.71	47.48	50.81	48.89	51.16	55.37	54.84	53.79	55.37	59.57	58.52	64.83
1811	65.18	81.30	95.32	71.49	70.09	76.40	77.10	77.45	76.05	73.24	71.84	65.53
1812	60.28		64.48	62.03	62.73	63.43	65.18	62.73	62.73	65.53	66.93	65.18
1813	65.18	65.18	60.98	60.28	65.88	70.09						
1814					66.58	67.28	64.83	63.43	65.18	65.01	68.34	70.61
1815	72.19	74.29	68.51	75.69	81.30	81.30	73.94	72.89		72.54	71.49	71.49
1816	71.49	80.60	81.65	80.25	80.95	84.11	82.65	86.85	84.11	84.11	84.11	88.19
1817	81.94	74.23	69.21	81.13	76.63	78.32	77.97	77.91	77.10	72.89	72.83	78.50
1818	75.64	77.10	77.21	77.10	76.22	79.08	77.10	77.51	75.69	75.64	78.44	80.60
1819	81.65	83.40	84.11	82.00	83.87	84.11	88.25	87.55	86.91	88.89	94.38	99.52
1820	97.25	94.62	94.50	93.92	94.50	94.62	92.52	90.41	86.91	89.71	89.07	89.30
1821	87.96	88.14	88.31	84.40	80.60	81.65	83.35	85.51	84.81	87.61	91.11	88.66
1822	87.90	87.55	84.81	85.80	86.50	87.61	87.61	86.21	86.21	86.91	87.96	88.31
1823	88.31	88.31	87.96	86.56	86.91	86.85	85.45	85.51	86.91	88.95	89.71	89.71
1824	89.34	88.66	88.83	89.57	89.75	89.71	90.33	90.16	90.06	89.98	90.00	90.04
1825	90.00	90.00	89.42	88.36	86.57	86.59	85.39	85.74	85.41	85.90	86.65	86.85
1826	87.11	86.83	88.89	89.26	88.85	90.40	91.04	90.59	93.43	94.62	94.88	96.48
1827	97.40	95.27	95.74	94.75	95.52	97.05	96.32	95.95	93.57	92.47	95.39	94.18
1828	91.96	91.18	91.10	89.36	88.42	88.71	88.42	86.17	87.25	84.80	83.68	85.85
1829	85.42	85.40	85.34	86.12	85.93	86.83	85.70	85.86	86.29	88.91	90.71	89.57
1830	89.19	90.00	89.77	89.81	90.95	90.95	89.63	90.89	91.18	93.20	97.79	96.15
1831	96.32	94.81	95.53	95.56	96.80	97.63	97.67	97.90	97.06	99.62	99.39	100.93
1832	101.2	101.90	101.19	102.10	103.35	100.95	102.67	101.85	101.10	102.60	103.90	103.90
1833	103.83	103.78	103.85	103.78	102.97	103.40	100.23	97.63	94.94	97.78	96.30	99.25
1834	96.32	95.53	95.88	94.49	93.83	93.53	92.13	92.22	92.26	91.08	92.79	93.53
1835	92.00	92.31	91.94	91.66	90.96	88.17	89.22	88.50	88.95	89.07	89.28	89.40
1836	89.61	89.34	89.30	89.36	89.11	87.37	87.74	87.39	87.88	87.86	89.30	90.58
1837	88.95	88.76	89.05	89.03	91.08	90.04	90.35	91.02	90.65	92.37	92.40	92.52
1838	91.37	90.96	92.00	91.85	91.11	91.17	90.80	90.76	90.69	90.69	91.43	92.10
1839	91.45	90.65	89.34	88.03	88.70	88.89	89.24	89.20	89.16	88.66	89.55	89.42
1840	90.24	89.87	89.91	90.00	90.12	90.16	90.10	89.36	88.66	89.51	90.20	90.20
1841	89.28	90.24	90.37	90.37	89.67	90.20	89.77	90.20	90.57	90.49	91.45	92.24
1842	91.41	91.33	90.63	90.32	90.47	90.14	90.67	90.35	89.24	90.63	92.09	91.83
1843	93.07	91.94	91.24	90.55	90.57	90.22	89.87	89.89	90.00	90.04	90.65	91.31
1844	91.31	91.29	91.04	90.49	90.80	89.90	89.11	89.38	88.62	88.60	89.30	89.34
1845	89.93	88.54	88.52	88.68	88.50	88.89	88.81	88.83	89.05	89.30	89.32	89.16
1846	88.92	89.01	88.76	89.32	89.24	88.57	89.12	89.00	89.04	88.40	88.58	88.89
1847	89.17	89.06	89.11	88.96	88.54	88.54	88.54	88.54	88.54	88.89	88.89	89.35
1848	89.41	89.58	91.32	90.97	91.32	90.63	90.63	90.28	90.45	90.63	91.67	91.67

Table A6.1 (cont.). *Monthly exchange rates on Hamburg. SEK per 100 marks 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1849	91.67	91.49	90.97	90.28	90.28	89.58	89.24	89.41	89.58	90.28	90.28	89.76
1850	89.93	89.76	89.41	89.24	89.24	88.89	89.06	89.24	89.06	89.24	90.80	90.28
1851	90.28	89.76	89.41	89.24	89.24	88.89	89.58	89.41	89.24	89.58	89.24	90.80
1852	89.93	89.93	89.24	89.41	89.58	89.06	89.58	89.76	88.72	89.24	89.24	89.06
1853	89.06	88.89	88.89	88.89	89.06	89.06	89.06	89.06	89.06	89.06	89.06	89.24
1854	89.24	89.06	89.24	89.06	89.06	89.06	89.06	89.06	89.06	89.06	89.06	89.58
1855	89.58	89.93	89.76	89.41	89.24	89.41	89.24	89.24	89.06	89.06	89.06	89.35
1856	89.58	89.81	89.81	89.41	89.41	89.24	89.58	89.88	89.70	89.76	89.93	90.63
1857	91.15	91.15	89.93	89.58	89.58	88.89	89.76	89.58	89.06	89.58	90.28	92.36
1858	94.11	90.24	90.10	90.10	89.67	89.17	90.10	89.77	88.99	89.26	89.77	90.61
1859	90.78	89.77	89.93	89.70	90.27	90.10	89.94	89.43	89.43	89.43	89.43	89.43
1860	89.77	89.94	89.77	89.60	89.27	89.44	89.54	89.60	89.77	89.70	89.94	89.94
1861	90.84	90.60	89.94	89.94	89.84	89.44	89.77	89.44	89.77	89.44	90.10	90.44
1862	90.27	90.27	89.54	89.77	89.44	89.60	89.27	89.27	89.44	89.60	89.77	89.77
1863	89.60	89.44	89.60	89.60	89.60	89.60	89.60	89.10	89.44	89.60	89.94	90.27
1864	89.94	89.60	89.60	89.60	89.54	89.60	89.60	89.50	89.77	89.44	89.44	89.44
1865	89.44	89.44	89.27	89.27	89.27	89.44	89.44	89.60	89.60	89.60	89.44	89.60
1866	89.77	89.77	89.60	89.77	89.77	90.10	90.10	89.77	89.60	89.77	89.77	89.60
1867	89.77	89.60	89.44	89.44	89.54	89.44	89.44	89.38	89.34	89.44	89.44	89.50
1868	89.77	89.60	89.44	89.34	89.44	89.60	89.94	89.94	89.94	89.34	89.37	89.60
1869	89.77	89.60	89.34	89.30	89.27	89.20	89.10	89.04	88.87	88.87	88.99	88.99
1870	88.99	88.99	88.99	88.99	88.99	88.94	89.84	89.27	88.99	88.94	88.94	88.94
1871	88.77	88.77	88.67	88.60	88.50	88.37	88.30	88.30	88.27	88.30	88.27	88.20
1872	88.27	88.20	88.20	88.20	88.20	88.10	88.10	88.44	88.27	88.27	87.93	87.93
1873	88.42	89.00	88.90	89.35	89.75	89.35	89.40	89.40	89.10	88.80	89.00	88.75
1874	89.30	89.20	89.10	89.15	89.00	88.90	89.00	89.00	88.90	89.25	89.25	89.00
1875	89.25	89.10	89.00	88.90	88.75	88.80	89.00	89.00	89.05	89.20	89.10	89.00
1876	89.15	88.90	88.90	88.90	88.90	88.85	88.85	88.85	88.90	89.00	88.90	88.90
1877	89.00	89.00	89.00	88.95	89.00	89.00	89.00	89.00	89.20	89.20	89.10	89.10
1878	89.15	89.15	89.15	89.15	89.15	89.10	89.10	89.10	89.10	89.10	89.00	89.00
1879	89.10	89.10	89.10	89.10	89.10	88.90	88.90	88.85	88.85	89.15	89.10	89.05
1880	89.03	88.87	88.80	88.87	88.86	88.81	88.81	88.84	88.91	88.94	89.00	88.99
1881	88.98	89.00	88.99	88.99	89.09	88.90	88.98	89.00	89.08	89.18	89.18	89.18
1882	89.21	89.20	89.16	89.15	89.15	89.13	89.14	89.14	89.08	89.05	89.11	89.22
1883	89.19	89.11	89.09	89.06	89.03	88.98	89.03	89.00	89.01	88.98	89.04	89.10
1884	89.10	89.07	89.04	89.01	89.01	88.93	89.00	89.03	89.06	89.11	89.10	89.14
1885	89.11	89.10	89.08	89.15	89.20	89.11	89.13	89.19	89.23	89.29	89.27	89.27
1886	89.23	89.14	89.01	88.96	89.00	88.97	88.95	88.95	88.95	89.01	89.10	89.10
1887	89.10	89.11	89.08	89.12	89.15	89.11	89.10	89.09	89.10	89.10	89.09	89.05
1888	89.07	89.10	89.12	89.12	89.05	89.04	89.00	88.97	89.01	89.12	89.15	89.15
1889	89.09	89.08	88.99	88.93	88.90	88.89	88.91	88.93	88.95	88.99	89.11	89.20
1890	89.12	89.05	89.08	89.13	89.10	89.20	89.14	89.10	89.13	89.21	89.28	89.30
1891	89.24	89.25	89.13	89.04	88.90	88.94	89.03	89.12	89.18	89.20	89.21	89.20
1892	89.18	89.01	88.95	88.91	88.90	88.96	88.94	88.86	88.94	88.98	88.95	88.99
1893	88.99	88.91	88.86	88.85	88.85	88.87	88.99	89.01	89.13	89.18	89.19	89.17

Table A6.1 (cont.). *Monthly exchange rates on Hamburg. SEK per 100 marks 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1894	89.07	88.91	88.88	88.84	88.85	88.85	88.85	88.87	88.90	88.90	88.90	88.90
1895	88.90	88.90	88.90	88.86	88.85	88.85	88.86	88.90	88.90	88.87	88.87	88.83
1896	88.88	88.93	88.93	88.90	88.89	88.90	88.90	88.90	88.95	89.06	89.10	89.13
1897	89.14	89.07	89.00	88.98	88.95	88.95	88.95	88.95	89.01	89.04	89.05	89.05
1898	89.01	88.93	88.90	88.90	88.96	88.98	89.03	89.01	89.07	89.13	89.11	89.17
1899	89.20	89.20	89.22	89.18	89.08	89.02	88.96	88.99	89.05	89.12	89.15	89.09
1900	89.10	89.10	89.11	89.12	89.10	89.08	89.08	89.01	89.07	89.10	89.01	89.00
1901	89.00	88.98	88.95	88.95	88.86	88.88	88.90	88.87	88.91	88.97	88.95	88.97
1902	88.96	88.94	88.95	88.95	88.95	88.95	88.90	88.90	88.88	88.90	88.87	88.91
1903	89.01	89.00	89.02	88.97	89.00	89.02	89.05	89.07	89.14	89.13	89.07	89.02
1904	89.04	89.05	89.07	89.05	89.07	89.03	89.02	88.91	89.02	89.13	89.17	89.04
1905	88.92	88.93	88.88	88.80	88.77	88.80	88.87	88.87	88.91	88.91	88.98	89.07
1906	89.01	88.96	88.95	88.90	88.87	88.88	88.92	88.97	89.06	89.07	89.10	89.12
1907	89.18	89.15	89.19	89.15	89.12	89.07	89.05	89.12	89.19	89.26	89.31	89.38
1908	89.36	89.18	89.22	89.22	89.20	89.22	89.07	88.97	88.98	88.94	88.87	88.89
1909	88.90	88.91	88.99	88.99	88.94	88.92	89.02	88.96	88.96	89.04	89.09	89.04
1910	89.06	89.02	89.05	88.97	88.97	88.95	88.95	88.97	88.99	88.92	88.92	88.94
1911	88.97	89.00	88.95	88.90	88.90	88.89	88.90	88.86	88.95	88.99	88.95	88.91
1912	88.94	88.92	88.99	88.93	88.90	88.95	88.90	88.90	88.95	88.97	88.97	89.04
1913	89.04	89.15	89.58	89.17	89.15	89.18	89.12	89.13	89.10	89.11	89.04	88.93
1914	88.90	88.90	88.98	88.94	89.01	89.01	89.00	89.16	89.26	87.62	84.97	87.41

Sources: 1804–33 and 1881–89: 'Växelkurser NN' (unpublished tables, Sveriges Riksbank); 1834–80: *Post och inrikes tidningar* and *Aftonbladet*; 1890–1914: *Riksbankens växelkurser på Hamburg/Berlin, 1890–1914* (unpublished volume, Sveriges Riksbank).

Appendix A6.2 Quotations on London

As the British currency was unchanged throughout the 19th century, even though it was officially converted into a monometallic gold currency in 1816, calculating consistent series of SEK per £1 is a simple matter. Quotations for bills drawn on London were made in skilling banco per £1 before 1858, in riksdaler riksmynt per £1 between 1858 and 1872 and in kronor per £1 thereafter. Conversion into SEK (kronor) has been done on the basis of 1 SEK = 1 riksdaler riksmynt = 32 skilling banco.

Sterling quotations in the period 1804–89 are from the Stockholm stock exchange, while the Riksbank's official quotations are used for the period 1890–1914.

Observations are monthly mid-range in the periods 1804–42 and 1881–89 and monthly average in 1843–80 and 1890–1914. The sources for periods 1804–42 and 1881–89 are unpublished tables from the Riksbank; daily newspapers are reported to be the sources in that volume. Daily newspapers (*Post och inrikes tidningar, Aftonbladet* and *Göteborgs handels- och sjöfartstidning*) are sources for daily London quotations

in the period 1843–80 from which monthly averages have been calculated. Official quotations on London 1890–1914 are from unpublished material in the Bank.

The most homogeneous series of quotations on London before 1870 are 90-day sterling bills. Consequently the discount that was deducted from these prices has to be added in order to obtain exchange rates short sight or sight. The exact calculations and data sources are presented in the previous section.

Table A6.2. *Monthly exchange rates on London. SEK per £1 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1804	6.74	6.68	6.83	6.96	7.06	7.02	7.02	6.98	6.93	6.91	7.15	6.90
1805	6.98	7.06	7.06	7.06	7.01	6.96	6.91	6.71	6.58	6.33	6.39	6.17
1806	6.36	6.60	6.71	6.58	6.90	6.74	6.76	6.80	6.64	6.76	7.07	6.91
1807	7.48	7.40	7.23	7.28	7.21	7.12	7.02	6.94	6.85	6.99	7.01	7.09
1808	7.15	6.96	6.80	6.74	6.82	6.79	6.81	6.80	6.79	6.79	6.80	6.77
1809	6.76	6.76	6.88	6.94	6.93	6.91	6.91	7.07	7.10	7.04	7.06	7.15
1810	8.16	7.78	8.57	8.46	8.84	9.56	9.14	9.37	9.59	9.65	9.56	9.57
1811	9.58	9.59	9.60	9.62	9.63	9.64	9.65	9.66	9.68	9.69	9.70	9.71
1812	9.72	9.74	9.75	9.76	9.77	9.78	9.80	9.81	9.41	9.60	9.81	9.87
1813	10.25	10.63	10.69	9.37	10.19	10.62	10.63	11.33	11.61	10.99	11.07	11.74
1814	11.50	11.49	11.52	11.17	10.33	10.36	10.92	11.36	11.79	11.50	11.99	12.37
1815	13.07	13.23	12.12	11.88	12.64	12.51	12.64	12.64	13.02	13.40	13.54	13.54
1816	13.54	15.06	15.95	15.69	15.82	16.45	17.09	17.67	17.34	17.34	17.34	17.97
1817	16.20	14.52	13.79	15.95	15.22	15.41	14.93	14.98	14.68	13.91	13.69	14.81
1818	14.15	14.43	14.37	14.33	14.14	14.80	14.49	14.53	14.28	14.01	14.36	15.06
1819	16.69	15.61	15.99	15.29	15.82	16.44	17.47	17.84	17.57	17.67	18.72	19.74
1820	19.46	18.98	18.96	19.08	19.24	19.33	19.13	18.70	17.97	16.96	18.48	18.73
1821	18.48	18.45	18.54	17.85	17.06	17.40	17.43	17.97	17.37	18.05	18.48	18.22
1822	18.10	18.10	17.44	17.71	17.96	16.89	18.22	18.01	17.96	18.10	18.14	18.13
1823	18.35	18.32	18.25	18.05	18.33	18.07	17.83	18.05	18.21	18.60	18.60	18.58
1824	18.49	18.38	18.46	18.53	18.51	18.48	18.55	18.58	18.60	18.59	18.57	18.60
1825	18.55	18.55	18.10	17.49	17.32	17.37	17.13	17.24	17.11	17.34	17.10	17.24
1826	17.38	17.70	18.16	18.47	18.45	19.09	19.11	19.01	19.43	19.70	19.74	19.74
1827	20.12	19.69	19.99	19.73	19.78	20.09	19.69	19.58	19.08	18.79	19.23	18.86
1828	18.73	18.54	18.53	18.35	18.12	18.28	18.28	17.74	17.81	17.21	17.08	17.39
1829	17.21	17.38	17.44	17.71	17.65	17.78	17.55	17.45	17.65	18.22	18.85	18.58
1830	18.50	18.78	18.79	18.79	18.85	18.86	18.28	18.59	18.46	18.78	19.74	19.33
1831	19.43	19.22	19.42	19.41	19.74	19.91	19.84	19.76	19.54	20.10	20.18	20.31
1832	20.50	20.93	20.93	21.13	21.51	21.01	21.32	21.26	20.93	21.32	21.38	21.42
1833	21.55	21.63	21.58	21.47	21.47	21.51	20.72	20.01	19.36	19.92	19.55	20.12
1834	19.51	19.48	19.52	19.26	19.11	19.06	18.84	18.84	18.72	18.53	18.98	18.90
1835	18.81	18.80	18.85	18.81	18.69	18.02	18.27	18.27	18.25	18.30	18.25	18.19
1836	18.26	18.36	18.31	18.26	18.17	17.76	17.74	17.75	17.76	17.77	17.91	18.02
1837	17.89	17.93	18.15	18.35	18.73	18.73	18.65	18.79	18.76	19.03	18.98	18.88
1838	18.64	18.58	18.89	18.79	18.71	18.70	18.51	18.49	18.41	18.46	18.48	18.30
1839	18.36	18.23	17.96	17.63	17.73	17.76	17.84	17.72	17.79	17.64	17.95	17.95
1840	18.31	18.29	18.35	18.13	18.29	18.15	18.17	17.86	17.64	17.63	17.91	17.88

Table A6.2 (cont.). *Monthly exchange rates on London. SEK per £1 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1841	17.90	18.03	18.10	18.22	18.41	18.22	18.16	18.17	18.22	18.29	18.48	18.53
1842	18.67	18.75	18.67	18.61	18.37	18.36	18.56	18.53	18.28	18.56	18.81	18.69
1843	18.90	18.90	18.86	18.78	18.87	18.74	18.62	18.62	18.60	18.54	18.70	18.75
1844	18.76	18.73	18.67	18.63	18.57	18.35	18.16	18.19	18.10	18.01	18.18	18.17
1845	18.28	18.36	18.21	18.20	18.15	18.19	18.17	18.10	18.09	18.02	18.00	18.10
1846	18.15	18.19	18.20	18.18	18.28	18.30	18.16	18.19	18.14	18.05	18.02	18.12
1847	17.98	17.91	17.86	17.93	18.02	17.99	17.95	17.98	18.01	18.18	18.34	18.48
1848	18.46	18.33	18.66	18.89	18.97	18.61	18.49	18.51	18.34	18.35	18.61	18.78
1849	18.88	18.76	18.56	18.51	18.49	18.48	18.45	18.44	18.44	18.48	18.65	18.49
1850	18.47	18.48	18.45	18.48	18.40	18.21	18.11	18.12	18.09	18.04	18.06	17.85
1851	17.85	18.01	17.95	17.87	17.81	17.84	17.87	17.90	17.89	18.01	18.12	18.19
1852	18.17	18.22	18.08	18.14	18.23	18.17	18.10	18.05	18.03	17.92	17.72	17.61
1853	17.59	17.63	17.69	17.70	17.72	17.71	17.63	17.66	17.63	17.63	17.53	17.56
1854	17.55	17.58	17.49	17.44	17.56	17.62	17.64	17.71	17.73	17.74	17.71	17.66
1855	17.72	17.82	17.84	18.06	17.96	17.89	17.87	17.83	17.78	17.87	17.89	17.93
1856	18.04	18.22	18.40	18.32	18.25	18.09	17.89	17.96	17.81	17.76	17.86	17.90
1857	18.01	18.12	18.01	17.93	17.89	17.78	17.78	17.88	17.77	17.75	18.04	18.45
1858	18.55	18.24	17.96	17.88	17.90	17.75	17.92	18.08	17.85	17.78	17.85	18.05
1859	18.06	17.93	17.81	17.79	17.61	17.59	17.64	17.68	17.70	17.63	17.66	17.68
1860	17.69	17.77	17.75	17.77	17.73	17.68	17.70	17.76	17.74	17.71	17.81	17.93
1861	18.05	18.08	18.10	18.03	18.08	18.05	18.16	18.07	18.12	18.13	18.05	18.12
1862	18.11	18.09	17.94	17.98	17.91	17.90	17.89	17.83	17.75	17.72	17.72	17.75
1863	17.77	17.86	17.79	17.85	17.86	17.85	17.90	17.96	17.85	17.77	17.84	17.85
1864	17.84	17.81	17.78	17.80	17.92	17.86	17.87	18.00	17.89	17.93	17.90	17.76
1865	17.78	17.80	17.83	17.86	17.91	17.92	17.90	17.99	17.95	17.98	17.96	17.92
1866	18.03	18.14	18.10	18.07	18.03	17.86	17.99	18.15	17.90	17.90	17.93	17.88
1867	17.94	17.98	17.99	17.92	17.98	17.97	17.99	18.05	18.07	18.04	18.06	18.08
1868	18.11	18.09	18.09	18.05	18.08	18.08	18.10	18.11	18.10	18.06	18.02	18.11
1869	18.14	18.15	18.12	18.17	18.17	18.15	18.14	18.11	17.98	17.92	17.93	17.99
1870	17.97	17.96	17.97	18.00	17.97	17.94	17.82	18.01	17.99	17.94	17.88	17.90
1871	17.92	17.96	17.94	17.93	17.95	17.90	17.80	17.80	17.77	17.87	17.82	17.71
1872	17.75	17.78	17.76	17.82	17.88	17.84	17.90	17.94	17.84	17.96	18.04	17.97
1873	17.96	18.01	17.94	17.99	18.05	18.02	18.05	18.03	17.99	18.08	18.14	17.96
1874	18.03	18.10	18.09	18.11	18.09	18.07	18.11	18.20	18.17	18.18	18.23	18.27
1875	18.27	18.25	18.25	18.27	18.28	18.28	18.26	18.15	18.13	18.09	18.08	18.12
1876	18.19	18.21	18.22	18.16	18.12	18.15	18.16	18.18	18.18	18.16	18.13	18.12
1877	18.14	18.19	18.18	18.15	18.20	18.21	18.17	18.18	18.23	18.25	18.26	18.21
1878	18.21	18.17	18.19	18.21	18.21	18.19	18.22	18.28	18.29	18.24	18.24	18.22
1879	18.21	18.19	18.20	18.19	18.16	18.13	18.17	18.18	18.17	18.12	18.16	18.15
1880	18.15	18.15	18.16	18.14	18.15	18.17	18.19	18.19	18.18	18.17	18.13	18.15
1881	18.16	18.22	18.21	18.23	18.23	18.22	18.23	18.23	18.23	18.24	18.22	18.21
1882	18.24	18.27	18.25	18.24	18.24	18.23	18.23	18.23	18.23	18.20	18.18	18.17
1883	18.17	18.22	18.23	18.21	18.22	18.24	18.24	18.25	18.23	18.18	18.17	18.17
1884	18.19	18.24	18.25	18.22	18.20	18.20	18.20	18.19	18.18	18.18	18.22	18.26
1885	18.26	18.27	18.29	18.27	18.24	18.19	18.18	18.18	18.19	18.18	18.18	18.18
1886	18.21	18.21	18.18	18.18	18.19	18.16	18.15	18.17	18.17	18.17	18.18	18.18

Table A6.2 (cont.). *Monthly exchange rates on London. SEK per £1 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1887	18.20	18.18	18.19	18.17	18.17	18.16	18.15	18.19	18.22	18.20	18.16	18.14
1888	18.16	18.16	18.14	18.14	18.16	18.14	18.16	18.21	18.23	18.23	18.19	18.19
1889	18.19	18.21	18.23	18.20	18.18	18.17	18.17	18.19	18.22	18.20	18.17	18.17
1890	18.21	18.23	18.20	18.18	18.17	18.16	18.21	18.24	18.19	18.20	18.22	18.20
1891	18.18	18.17	18.17	18.16	18.19	18.17	18.14	18.14	18.15	18.15	18.17	18.16
1892	18.16	18.18	18.19	18.18	18.16	18.13	18.15	18.15	18.14	18.14	18.13	18.12
1893	18.12	18.16	18.17	18.16	18.20	18.16	18.16	18.21	18.19	18.14	18.14	18.14
1894	18.17	18.20	18.18	18.14	18.13	18.12	18.12	18.13	18.12	18.10	18.13	18.13
1895	18.15	18.19	18.18	18.19	18.19	18.17	18.16	18.19	18.16	18.15	18.19	18.16
1896	18.18	18.21	18.20	18.17	18.16	18.13	18.13	18.14	18.14	18.15	18.17	18.16
1897	18.19	18.19	18.17	18.14	18.14	18.11	18.11	18.13	18.15	18.13	18.12	18.14
1898	18.17	18.18	18.21	18.25	18.25	18.16	18.15	18.17	18.18	18.22	18.23	18.22
1899	18.23	18.22	18.22	18.24	18.23	18.20	18.21	18.24	18.22	18.25	18.23	18.27
1900	18.28	18.28	18.26	18.27	18.28	18.20	18.22	18.25	18.24	18.23	18.20	18.18
1901	18.21	18.23	18.19	18.16	18.17	18.15	18.14	18.16	18.15	18.14	18.17	18.16
1902	18.16	18.19	18.20	18.21	18.22	18.21	18.20	18.21	18.19	18.18	18.17	18.18
1903	18.21	18.24	18.25	18.24	18.22	18.18	18.15	18.15	18.17	18.19	18.21	18.19
1904	18.22	18.25	18.21	18.21	18.18	18.17	18.18	18.19	18.17	18.16	18.16	18.15
1905	18.17	18.21	18.19	18.18	18.18	18.18	18.19	18.18	18.17	18.18	18.18	18.17
1906	18.20	18.23	18.22	18.21	18.22	18.21	18.20	18.21	18.21	18.23	18.28	18.27
1907	18.28	18.29	18.30	18.28	18.24	18.23	18.21	18.22	18.26	18.29	18.36	18.36
1908	18.33	18.26	18.25	18.23	18.21	18.20	18.16	18.15	18.15	18.16	18.18	18.19
1909	18.21	18.24	18.25	18.21	18.18	18.18	18.20	18.19	18.16	18.20	18.24	18.22
1910	18.22	18.22	18.22	18.24	18.25	18.21	18.19	18.20	18.19	18.20	18.21	18.17
1911	18.21	18.23	18.20	18.19	18.18	18.16	18.19	18.19	18.21	18.25	18.20	18.19
1912	18.23	18.24	18.22	18.22	18.20	18.20	18.21	18.20	18.20	18.24	18.26	18.21
1913	18.23	18.26	18.26	18.26	18.24	18.23	18.24	18.24	18.20	18.24	18.26	18.23
1914	18.23	18.18	18.19	18.20	18.24	18.25	18.25	18.36	18.63	18.85	18.99	19.19

Sources: 1804–42 and 1881–89: 'Växelkurser NN' (unpublished tables, Sveriges Riksbank); 1843–80: *Post och inrikes tidningar* and *Aftonbladet*; 1890–1914: *Riksbankens växelkurser på London, 1890–1914* (unpublished volume, Sveriges Riksbank).

Appendix A6.3 Quotations on Amsterdam

The currency units in quotations on Amsterdam changed a few times during the period and have been converted into consistent series of SEK/100 gulden. Quotations on Amsterdam were originally made in skilling banco per Holländsk riksdaler kurant between 1804 and 1857. From 1858 to 1872 quotations were made in riksdaler riksmynt per 100 Holländsk gulden and between 1873 and 1914 in kronor per 100 gulden. Conversions into SEK per 100 gulden have been done on the basis of 2.5 Holländsk gulden = 1 Holländsk riksdaler kurant, 1 Holländsk gulden = 1 gulden and 32 skilling banco = 1 riksdaler riksmynt = 1 SEK (krona).

Quotations between 1804 and 1889 are from the Stockholm stock exchange and are monthly mid-range observations. The sources are unpublished tables that most likely were the basis for calculations for the fifth, statistical volume in Sveriges Riksbank (1931); daily newspapers are reported to be the sources in that volume. Monthly averages from the Riksbank's official quotations are used for the period 1890–1914. Official quotations are from unpublished material in the Bank.

Quotations on bills drawn on Amsterdam in the period 1804–52 are u.s.o. since there is no information on periods of maturity. Quotations are short sight or less than 50 days for 1853–80 and sight for 1881–1914.

Table A6.3. *Monthly exchange rates on Amsterdam. SEK per 100 gulden 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1804	58.3	58.1	58.8	59.4	59.7	59.7	59.7	59.5	59.5	59.5	60.0	60.3
1805	59.5	59.8	59.5	59.7	59.5	59.5	59.2	58.3	57.7	57.7	57.7	56.9
1806	56.7	56.9	58.6	59.2	60.9	59.4	59.7	60.5	60.2	60.2	61.3	65.6
1807	66.9	66.7	66.6	65.6	64.4	64.7	64.1	63.9	64.1	64.7	66.3	68.1
1808	66.9	66.9	64.7								66.3	
1809									75.0	71.9		
1810	81.3	77.5		83.1			98.1	88.8	93.1	97.5	103.8	100.0
1811				136.9					126.9		118.8	
1812		102.5	107.5			107.5		115.0	105.0	116.3	115.0	
1813	113.8		111.3									
1814	112.5	111.3			113.8	114.4	114.1	108.1	108.1	108.8	115.0	118.1
1815	121.3	123.8	119.4	125.6	132.5	133.8	125.0	123.8		123.8	123.1	125.0
1816	125.0	130.0	135.3	133.1	133.1	136.6	142.5	143.5	140.4	142.5	145.5	148.2
1817	139.1	127.8	115.5	132.3	133.5	130.1	129.7	128.5	127.4	117.5	121.0	126.3
1818	123.8	127.4	128.3	129.0	126.9	131.1	130.9	130.5	127.7	125.6	128.5	132.0
1819	137.2	138.2	138.8	137.4	141.1	142.6	146.3	148.5	147.5	149.3	157.5	166.3
1820	165.0	161.3	158.8	159.4	159.4	160.6	158.1	151.3	145.6	148.4	150.9	152.8
1821	151.6	149.9	150.6	147.5	138.9	137.5	139.2	139.5	140.4	141.3	146.9	148.1
1822	146.6	146.6	143.0	143.1	145.6	147.2	149.0	147.8	146.3	147.4	150.6	151.0
1823	151.1	151.3	150.9	148.4	147.1	146.9	144.6	144.1	145.5	149.3	152.5	153.1
1824	153.4	153.3	154.1	155.5	155.3	155.3	155.6	154.4	154.4	155.3	155.8	156.9
1825	155.9	155.2	153.8	150.0	146.4	146.1	144.4	144.4	144.4	142.4	144.6	143.8
1826	143.6	143.8	147.4	147.3	149.0	151.9	155.3	154.4	157.3	159.8	162.4	164.2
1827	164.7	162.7	163.8	163.0	163.4	163.0	164.2	163.0	160.8	158.2	159.0	158.4
1828	155.4	154.4	154.7	153.1	150.2	149.7	150.3	146.6	145.9	144.6	143.4	145.0
1829	145.6	144.8	145.9	145.9	144.9	144.5	143.7	142.6	142.8	145.5	150.0	150.6
1830	149.4	150.6	153.0	152.0	152.3	152.0	150.4	149.0	149.7	152.5	161.3	163.5
1831	163.1	161.9	163.1	162.5	163.9	165.0	163.9	164.4	163.2	165.3	168.4	170.3
1832	170.6	171.3	173.5	171.9	174.5	172.8	171.1	171.3	171.6	171.9	173.8	175.0
1833	175.7	177.3	178.4	178.8	176.9	176.1	173.4	166.9	162.2	162.5	163.1	164.7
1834	161.9	160.5	159.7	158.0	156.0	155.8	153.8	152.7	152.4	151.3	152.4	154.1
1835	153.3	152.8	153.6	153.3	153.0	148.8	148.4	148.4	148.0	148.3	148.6	149.2
1836	148.8	150.0	150.0	149.1	149.0	147.5	145.9	144.5	144.9	145.3	146.7	149.4

Table A6.3 (cont.). *Monthly exchange rates on Amsterdam. SEK per 100 gulden 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1837	148.0	148.1	149.1	148.4	151.3	151.1	151.5	152.3	152.1	153.8	155.6	155.9
1838	154.4	152.7	154.1	154.1	151.7	152.0	150.8	150.2	150.5	150.4	151.8	153.1
1839	153.1	152.2	151.9	148.6	147.5	147.0	146.4	146.0	145.5	145.0	146.5	150.6
1840	148.4	150.9	150.0	151.6	150.6	149.9	149.4	148.3	146.6	147.8	148.1	149.2
1841	148.4	149.1	150.0	149.1	149.0	149.2	148.8	149.1	149.8	150.2	151.6	153.8
1842	152.3	152.2	152.0	150.9	150.9	149.8	149.4	150.3	148.4	149.1	153.8	154.1
1843	154.2	153.8	153.8	152.3	153.1	152.8	150.6	150.9	151.6	151.3	152.5	154.5
1844	153.8	153.4	153.1	153.1	151.6	150.0	149.4	149.4	149.1	147.8	150.0	150.4
1845	150.0	149.4	149.1	148.1	147.2	147.2	147.0	146.6	146.4	145.6	145.4	147.5
1846	148.1	148.8	148.3	146.1	147.3	147.8	146.9	146.9	146.8	145.8	146.9	148.4
1847	148.8	147.5	147.2	147.8	147.2	146.6	146.9	147.2	147.3	147.3	147.2	149.1
1848	150.6	150.0	151.6	152.2	154.1	152.5	152.1	152.1	151.9	151.9	153.8	154.7
1849	154.5	154.4	153.1	153.5	152.8	152.2	151.9	152.2	152.3	152.2	152.5	153.2
1850	153.8	153.4	152.6	152.2	150.0	150.2	149.4	149.6	149.1	149.5	151.5	151.3
1851	151.3	151.6	151.3	150.9	149.7	150.5	150.6	151.4	150.0	150.6	151.3	152.2
1852	152.7	152.5	153.1	151.9	151.3	150.8	150.1	150.6	150.1	150.2	150.6	150.6
1853	149.7	150.9	149.9	149.1	149.2	150.0	148.4	149.4	149.1	148.4	149.1	150.3
1854	150.0	150.3	150.2	149.1	149.3	149.4	149.7	149.5	149.4	149.7	149.1	149.5
1855	149.7	150.3	150.9	150.6	149.2	148.6	148.8	149.4	148.6	148.6	149.5	149.4
1856	151.3	151.6	151.3	150.9	150.6	149.4	149.5	150.3	150.2	150.5	150.8	152.2
1857	152.8	153.4	152.2	150.3	150.0	149.5	150.0	150.5	149.7	149.1	149.4	153.1
1858	154.1		151.6	150.5	150.5	152.0	150.8	151.1	150.5	150.5	152.0	153.0
1859	153.0	152.4	151.6	151.5	150.5	150.9	151.3	150.8	151.0	151.6	152.0	151.8
1860	152.0	152.0	152.3	151.5	150.3	150.0	150.3	149.8	150.3	150.5		152.8
1861	152.3		151.5	150.5	152.1	150.0	150.5	150.4	152.3	150.5	150.8	152.8
1862	152.5	154.0	154.0	154.0	151.9	151.6	151.8	150.3	150.8		152.8	153.8
1863	152.3	151.0	152.0	151.9	152.0	150.5	150.1	150.5	151.5	150.5	150.4	151.0
1864	150.9	150.4	151.0				149.5	149.5	149.3	148.6	151.6	150.9
1865	151.9			152.3	151.8	151.8	150.5	150.0	150.4	150.3		150.3
1866	151.5	152.0	151.5	152.5		152.0		153.0		152.0	153.0	153.0
1867	153.0		152.5	152.5	152.8	152.6			152.2	152.0	152.3	152.1
1868	152.1	152.4	152.6	152.2	152.4		152.6				152.0	152.0
1869	152.0			151.8		151.0		151.6		150.5	151.5	151.9
1870	151.6	152.8	150.8	150.6	151.8	151.5		150.0	152.5			151.8
1871	151.4	151.5	151.5	151.0	150.9	149.5			150.4		150.2	
1872		149.3	149.0	148.6	148.9	148.8				148.8		
1873	149.3	150.4	149.4	149.9	150.7	150.4	150.6	150.8	150.4	151.0	151.1	150.9
1874	151.3	153.1	152.9	152.4	152.8	152.9	152.4	152.8	153.0	153.4	154.3	154.8
1875	155.2	156.4	154.5	156.4	156.3	154.4	153.0	152.5	152.2	151.0	150.9	151.0
1876	151.0	151.2	151.1	151.0	150.7	150.9	150.8	150.7	150.6	150.8	151.0	150.9
1877	150.9	151.1	151.3	151.5	151.1	151.4	151.2	151.1	150.7	150.8	151.0	150.6
1878	150.5	150.6	150.8	150.9	150.9	150.5	150.9	151.2	150.9	151.1	150.2	150.8
1879	150.5	151.0	150.8	151.0	151.3	151.2	151.2	151.2	150.9	150.4	150.4	150.4
1880	150.5	150.9	151.0	150.7	150.4	150.6	150.3	150.2	150.1	150.0	150.1	150.1
1881	150.1	150.2	150.3	150.6	150.7	150.8	150.8	150.5	150.0	150.1	150.1	150.3
1882	150.7							150.5	150.3	150.1		

Table A6.3 (cont.). *Monthly exchange rates on Amsterdam. SEK per 100 gulden 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1883					151.4		150.7	150.5	150.4	150.2	150.3	150.3
1884	150.4	150.8	150.9	150.9	150.8	150.6	150.6	150.3	150.3	150.2	150.2	150.3
1885	150.6	151.1	151.2	151.3	151.2	151.1	151.1	151.0	150.8	150.7	150.9	150.9
1886	151.0	151.0	151.0	151.0	150.9	150.6	150.5	150.5	150.4	150.2	150.4	150.3
1887	150.4	150.2	150.2	150.3	150.7	150.6	150.5	150.5	150.5	150.5	150.5	150.4
1888	150.6	150.8	150.7	150.7	150.6	150.5	150.6	150.8	150.6	150.5	150.5	150.5
1889	150.6	150.7	150.7	150.6	150.7	150.6	150.6	150.6	150.6	150.5	150.3	150.3
1890	150.5	150.5	150.5	150.6	150.8	150.6	150.7	150.7	150.5	150.5	150.4	150.5
1891	150.8	150.6	150.7	150.6	150.6	150.5	150.5	150.4	150.2	150.2	150.4	150.5
1892	150.6	150.5	150.5	150.5	150.5	150.4	150.4	150.4	150.2	150.2	150.3	150.3
1893	150.3	150.6	150.6	150.6	150.4	150.1	149.8	150.1	150.3	150.6	150.7	150.7
1894	150.9	151.0	150.8	150.5	150.4	150.3	150.3	150.1	149.8	150.0	150.3	150.2
1895	150.4	150.6	150.4	150.2	150.3	150.1	150.2	150.1	149.9	149.7	149.8	149.7
1896	149.7	149.8	150.0	150.2	150.3	149.8	150.0	150.0	149.9	149.9	150.2	150.0
1897	150.4	150.5	150.3	150.2	150.3	150.2	150.1	150.1	150.0	150.2	150.4	150.3
1898	150.5	150.8	150.7	150.8	150.9	150.6	150.8	150.8	150.6	150.5	150.6	150.4
1899	150.6	150.5	150.3	150.3	150.2	149.9	150.0	150.4	150.4	151.0	151.2	151.0
1900	151.3	151.1	150.5	150.7	150.9	150.5	150.7	150.6	150.5	150.8	150.9	150.7
1901	150.9	150.9	150.5	150.2	150.6	150.3	150.3	150.1	150.9	150.0	150.2	150.0
1902	150.0	150.0	150.0	150.0	150.1	150.0	150.0	150.1	150.1	150.0	149.9	149.9
1903	150.1	150.3	150.3	150.4	150.4	150.1	150.4	150.4	150.4	150.7	150.9	150.9
1904	151.0	151.0	150.7	150.7	150.6	150.2	150.5	150.5	150.3	150.5	150.7	150.6
1905	150.6	150.7	150.6	150.5	150.5	150.4	150.6	150.7	150.1	150.0	149.9	150.0
1906	150.5	150.3	150.1	150.0	150.1	150.1	150.3	150.6	150.5	150.6	150.7	150.7
1907	150.9	150.8	150.8	151.0	151.1	151.0	151.0	151.2	151.2	151.6	151.6	151.5
1908	151.4	151.2	150.8	150.6	150.6	150.4	150.4	150.3	150.4	150.5	150.8	150.8
1909	150.9	150.7	150.6	150.8	150.7	150.4	150.6	150.5	150.3	150.3	150.3	150.2
1910	150.4	150.2	150.0	150.5	150.8	150.7	150.8	150.9	150.8	150.7	150.7	150.7
1911	150.8	150.8	150.7	150.7	150.7	150.5	150.7	150.6	150.5	150.6	150.7	150.7
1912	150.9	150.8	150.7	150.8	150.8	150.7	150.8	150.8	150.8	151.1	151.0	150.8
1913	150.9	150.8	150.5	150.6	150.4	150.2	150.3	150.3	150.3	150.6	150.7	150.5
1914	150.8	150.7	150.6	150.7	150.7	150.5	150.6	150.8	155.6	160.6	161.0	161.9

Sources: 1804–89: 'Växelkurser NN' (unpublished tables, Sveriges Riksbank); 1890–14: *Riksbankens växelkurser på Amsterdam, 1890–1914* (unpublished volume, Sveriges Riksbank).

Appendix A6.4 Quotations on Paris

Quotations on Paris were made in skilling banco per franc before 1858 and in riksdaler riksmynt per franc between 1858 and 1872. Conversion into SEK (kronor) has been done on the basis of 32 skilling banco = 1 riksdaler riksmynt = 1 SEK.

Quotations on bills drawn on Paris in francs during the period 1804–89 are from the Stockholm stock exchange, while the Riksbank's official quotations are used for the period 1890–1914.

Observations on franc rates are monthly mid-range in the period 1804–89 and monthly average 1890–1914. The sources for the period 1804–89 are unpublished tables from the Riksbank. Official quotations on Paris 1890–1914 are from unpublished material in the Bank.

The maturity periods of bills drawn on Paris before June 1853 are somewhat unclear. However, it seems quite clear that the rates refer to paper with a longer duration than short sight. A note in the primary tables says that rates from 1853 refer to 90-day paper, so it seems safe to assume that quotations are on at least 90-day paper. Consequently, the discount embedded in the prices has to be added in order to obtain 'true' sight exchange rates. Because interest rate data from Paris are lacking for this period, a standard interest rate of five percent has been used to calculate sight rates. The exact procedure is outlined in the previous section.

Table A6.4. *Monthly exchange rates on Paris. SEK per 100 francs 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1804	28.74	29.40	27.42	29.53	29.53	28.61	28.08	28.21	29.53	28.61	28.48	30.06
1805	29.40	28.87	28.48	28.34	29.40	28.21	28.48	27.95	27.16	27.95	25.84	28.48
1806	28.21	26.89	27.95	27.82	29.53	26.89	30.06	28.48	28.61	30.06	30.85	
1807	33.22	32.96		33.22	32.96	30.98	31.24	30.06			33.22	
1808	33.22	34.01	30.85									
1809							39.55	41.13		37.97	39.55	38.76
1810	41.13			41.13	42.32			47.46	49.04	50.62		56.95
1811		63.28	68.03	63.28	62.49	63.28		64.86	63.28	63.28	62.23	57.74
1812	52.21	54.58	56.95		54.58	55.37		57.74		55.37	55.37	56.95
1813		56.42		50.62					58.53			
1814							55.37	52.73	53.39	53.26	55.37	56.56
1815	58.53	58.53	56.95		56.95						61.70	61.30
1816	61.70	60.91	64.86	62.49	64.86			70.40	68.16	70.40	71.19	70.00
1817	66.44	64.07	57.74	60.91	66.84	61.83	62.49	60.64	60.78	56.16	58.93	58.80
1818	60.12	59.85	61.70	60.25	58.53	61.30	62.49	61.57	59.59	57.35	58.93	63.28
1819	66.44	67.10	68.03	65.65	65.65	67.76	68.42	69.61	68.69	70.14	75.94	79.89
1820	77.52	78.57	75.80	75.94	76.07	76.46	78.57	76.73	71.59	72.24	73.30	73.70
1821	71.98	73.96	74.22	72.77	69.34	66.44	69.48	70.40	70.53	68.95	72.77	71.19
1822	71.45	71.72	71.19	70.53	70.27	71.98	73.43	71.32	71.19	71.45	71.85	71.98
1823	72.38	72.38	73.30	72.77	71.72	71.72	70.66	70.00	71.06	71.06	73.70	73.70
1824	72.77	72.51	72.24	73.17	73.56	73.56	73.96	73.30	74.09	73.96	73.96	74.75
1825	73.83	75.15	74.88	72.64	70.93	70.79	69.87	69.21	68.82	68.55	69.34	69.21
1826	70.66	70.99	71.59	70.27	71.32	73.43	74.35	73.43	74.75	75.94	77.91	79.36
1827	80.42	79.63	78.31	77.52	77.39	78.18	78.05	77.65	76.60	74.75	75.01	75.54
1828	74.35	74.49	73.96	73.43	72.11	72.24	71.72	70.53	70.53	70.00	68.03	69.21
1829	69.87	69.74	69.74	69.87	69.21	69.08	68.03	68.42	68.55	69.61	72.51	72.38
1830	72.38	72.38	73.30	73.30	73.43	73.70	72.24	72.51	72.64	73.56	77.39	78.31
1831	78.31	78.05	78.31	78.31	79.23	80.68	79.50	79.10	78.57	79.36	80.02	81.21

Table A6.4 (cont.). *Monthly exchange rates on Paris. SEK per 100 francs 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1832	81.47	81.61	82.79	82.53	83.06	82.13	81.67	81.61	81.87	81.74	83.45	83.32
1833	83.45	83.71	82.79	83.71	83.32	83.32	82.26	79.10	77.12	76.99	77.39	78.31
1834	77.78	77.65	76.99	76.33	75.80	75.15	74.09	74.09	73.43	73.30	73.83	74.62
1835	74.35	73.83	74.22	74.09	73.96	71.72	71.72	71.19	71.72	71.26	71.26	71.06
1836	72.90	72.64	73.70	71.72	71.45	70.40	70.00	69.61	70.14	70.27	71.72	72.77
1837	72.11	71.72	71.59	72.11	73.56	72.51	72.77	73.43	73.17	74.35	74.75	74.62
1838	73.56	73.30	74.22	73.96	73.43	73.56	72.77	72.51	72.38	72.38	72.51	73.30
1839	72.90	72.64	72.77	71.45	70.66	71.19	71.19	70.40	70.27	70.14	70.66	71.72
1840	72.51	73.43	73.17	72.90	72.24	72.11	71.85	71.26	71.72	71.45	71.06	71.32
1841	71.59	71.59	71.45	71.98	72.24	71.98	71.92	71.92	71.98	72.24	73.17	73.83
1842	73.83	73.83	73.70	73.83	72.90	72.64	72.24	72.51	72.51	72.38	73.56	73.83
1843	74.35	74.35	74.49	74.09	73.83	73.04	72.64	72.77	73.30	72.51	73.43	73.70
1844	74.09	73.96	73.96	73.30	73.04	72.24	71.72	71.32	71.72	71.06	71.45	72.11
1845	72.24	72.51	72.38	71.59	71.59	71.72	71.06	71.32	71.19	70.93	70.93	71.06
1846	71.06	71.72	71.72	71.45	71.45	71.32	70.93	70.79	70.93	70.73	71.45	71.19
1847	71.06	70.79	71.19	70.66	70.14	70.53	70.27	70.79	70.79	70.93	71.19	72.11
1848	72.51	72.11	72.64	74.35	75.67	74.35	73.30	74.22	73.17	73.56	74.62	74.88
1849	75.41	75.41	75.15	73.96	74.35	74.22	73.43	73.56	73.56	73.70	73.83	73.56
1850	73.43	73.83	73.96	73.30	73.30	73.04	73.17	72.24	72.24	72.24	72.90	73.04
1851	73.30	72.77	72.51	73.17	73.30	72.05	73.17	72.38	72.24	72.51	72.77	73.30
1852	72.51	72.90	72.90	72.64	72.77	73.04	72.11	72.24	72.11	71.85	71.85	71.59
1853	71.72	71.59	71.98	72.11	71.45	71.45	71.09	71.61	71.61	70.83	70.83	70.83
1854	70.96	70.57	70.64	70.70	70.70	70.70	70.70	70.96	71.35	71.35		71.29
1855			71.16				71.35	70.83	71.35	71.35	70.44	70.83
1856												
1857	72.92	71.09	72.92		71.88						68.75	71.22
1858	70.38	70.75	70.80	70.70	70.00	72.25	71.25	72.00		70.50	72.00	72.50
1859	71.75	71.75	70.75	70.75	71.00	71.00	69.83	70.05	70.10	71.00	70.60	70.88
1860	71.18	70.75	71.13	70.88	70.20	70.50		69.90	70.50	70.80	71.13	71.38
1861	71.50	70.50	71.00	71.75					71.00		70.63	71.00
1862	71.90		71.00		71.50	71.45		71.00	71.00	70.80	70.75	70.75
1863	70.95	71.08	70.85	71.13	70.98	70.90	70.95		70.60		70.75	70.38
1864	71.00	70.90						70.10	70.30		70.67	70.25
1865	70.50											
1866												
1867					71.50						71.90	72.00
1868	72.13			72.00		71.90						
1869		72.10										
1870									71.25	71.65		
1871			71.63			70.95	70.95	70.50				
1872			69.95	70.48					69.70			
1873	70.28	70.70	70.73	70.80	70.93	70.50	70.70	71.10	71.05	71.08	71.10	71.10
1874	71.43	71.70	71.85	71.95	71.93	71.90	71.88	72.18	72.33	72.38	72.60	72.85
1875	72.80	72.84	72.80	72.73	72.70	72.60	72.30	72.20	72.10	72.00	71.83	71.95

Table A6.4 (cont.). *Monthly exchange rates on Paris. SEK per 100 francs 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1876	72.23	72.40	72.40	72.25	72.00	71.93	71.88	72.05	72.08	72.18	72.21	72.18
1877	72.30	72.34	72.39	72.50	72.43	72.48	72.23	72.20	72.38	72.33	72.28	72.30
1878	72.35	72.30	72.35	72.28	72.26	72.23	72.20	72.30	72.33	72.16	72.08	71.98
1879	72.08	72.15	72.06	72.05	71.95	71.94	71.87	71.93	71.79	71.65	71.70	71.80
1880	71.88	72.00	72.00	71.92	71.85	71.79	71.75	71.79	71.68	71.65	71.65	71.71
1881	71.83	71.93	72.10	72.00	72.05	72.10	72.13	72.20	72.00	71.85	72.08	72.08
1882	72.35	72.43	72.28	72.25	72.40	72.40	72.50	72.45	72.28	72.13	72.10	72.05
1883	72.13	72.33	72.25	72.23	72.23	72.15	72.15	72.10	72.08	71.93	72.00	72.05
1884	72.23	72.35	72.38	72.35	72.30	72.15	72.25	72.25	72.20	72.13	72.11	72.13
1885	72.17	72.15	72.18	72.13	72.13	72.14	72.03	72.15	72.13	72.10	72.10	72.10
1886	72.18	72.28	72.35	72.40	72.25	72.03	71.90	71.90	71.93	71.95	71.88	71.73
1887	71.83	71.73	71.73	71.83	71.99	72.00	71.95	71.98	71.80	71.73	71.73	71.65
1888	71.78	72.00	71.88	71.83	71.85	71.83	71.90	71.88	71.85	71.80	71.80	71.85
1889	71.93	72.05	72.01	72.04	72.10	72.20	72.25	72.25	72.18	72.13	72.00	72.03
1890	72.13	72.25	72.20	72.18	72.27	72.27	72.25	72.13	71.99	71.91	71.97	71.99
1891	72.09	72.10	72.08	72.05	72.03	71.91	71.85	71.85	71.79	71.78	71.96	72.00
1892	72.07	72.20	72.20	72.20	72.17	72.08	72.15	72.15	72.12	72.06	72.00	72.05
1893	72.15	72.28	72.24	72.27	72.21	72.15	72.11	72.05	71.99	72.00	72.05	72.08
1894	72.19	72.30	72.22	72.08	72.01	72.03	72.06	72.06	71.97	71.98	72.16	72.16
1895	72.15	72.21	72.07	72.07	72.15	72.09	72.10	72.03	71.94	71.96	72.13	72.00
1896	72.06	72.17	72.19	72.22	72.28	72.11	72.06	72.05	72.04	72.04	72.02	71.97
1897	72.11	72.23	72.19	72.21	72.28	72.20	72.19	72.12	72.08	72.00	72.04	71.95
1898	72.03	72.08	72.00	72.09	72.10	71.92	72.05	72.01	71.94	71.96	71.98	72.08
1899	72.34	72.36	72.27	72.29	72.28	72.27	72.24	72.24	72.14	72.17	72.20	72.18
1900	72.47	72.58	72.48	72.53	72.62	72.44	72.54	72.53	72.49	72.56	72.49	72.44
1901	72.52	72.38	72.21	72.15	72.22	72.02	72.03	72.08	71.99	72.07	72.29	72.21
1902	72.27	72.38	72.38	72.34	72.33	72.27	72.34	72.32	72.24	72.31	72.32	72.29
1903	72.44	72.56	72.55	72.50	72.40	72.26	72.29	72.19	72.14	72.31	72.35	72.28
1904	72.40	72.47	72.40	72.46	72.41	72.17	72.10	72.08	72.07	72.24	72.27	72.13
1905	72.29	72.33	72.22	72.30	72.25	72.26	72.35	72.30	72.20	72.28	72.32	72.35
1906	72.46	72.50	72.48	72.50	72.38	72.36	72.37	72.37	72.32	72.37	72.40	72.36
1907	72.52	72.47	72.35	72.47	72.56	72.51	72.44	72.58	72.62	72.79	72.87	72.88
1908	72.82	72.53	72.52	72.58	72.54	72.44	72.30	72.21	72.26	72.34	72.44	72.45
1909	72.50	72.39	72.32	72.35	72.29	72.16	72.28	72.21	72.22	72.35	72.37	72.29
1910	72.37	72.37	72.30	72.26	72.24	72.17	72.21	72.16	72.10	72.04	72.05	71.95
1911	72.05	72.08	71.97	71.90	71.90	71.81	71.95	72.04	72.26	72.51	72.27	72.10
1912	72.26	72.23	72.20	72.22	72.16	72.14	72.19	72.07	72.00	72.26	72.38	72.24
1913	72.39	72.37	72.31	72.37	72.37	72.26	72.28	72.24	72.11	72.19	72.18	72.02
1914	72.21	72.18	72.16	72.34	72.48	72.49	72.53	73.25	73.73	74.67	76.09	77.45

Sources: 1804–89: 'Växelkurser NN' (unpublished tables, Sveriges Riksbank); 1890–1914: *Riksbankens växelkurser på Paris, 1890–1914* (unpublished volume, Sveriges Riksbank).

Appendix A6.5 Quotations on Antwerp and Brussels

Belgium adopted an independent franc – equal to the French franc – in 1832 and joined the Latin Monetary Union in 1865. Thus, SEK/franc applies for the whole sample 1873–1914.

Quotations for bills drawn on Antwerp and Brussels in francs during the period 1873–89 are from the Stockholm stock exchange, while the Riksbank's official quotations are used for the period 1890–1914.

Observations on franc rates are monthly mid-range in the period 1873–89 and monthly average for 1890–1914. The sources for the period 1873–89 are unpublished tables from the Riksbank. Official quotations on Antwerp and Brussels for 1890–1914 are from unpublished material in the Bank.

Quotations on Antwerp and Brussels refer to short sight bills of exchange in 1873–89 and to sight bills between 1890 and 1914.

Table A6.5. *Monthly exchange rates on Antwerp. SEK per 100 francs 1873–89.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1873	70.65	71.00	71.00	70.85	70.93	70.85	70.88	71.25	71.00	71.18	71.00	70.75
1874	71.15	71.58	71.70	71.83	71.90	71.83	71.83	72.13	72.28	72.33	72.53	72.73
1875	72.80	72.75	72.63	72.70	72.65	72.60	72.20	72.08	72.03	71.95	72.00	71.95
1876	72.25	72.35	72.35	72.18	71.98	71.98	71.88	71.95	72.05	71.98	72.23	72.25
1877	72.28	72.25	72.34	72.40	72.48	72.45	72.20	72.20	72.25	72.25	72.25	72.40
1878	72.25	72.23	72.35	72.35	72.05	72.15	72.13	72.30	72.23	72.15	72.08	71.98
1879	72.03	72.15	72.15	72.10	71.88	71.90	71.85	72.00	71.90	71.65	71.69	71.80
1880	71.83	71.95	71.99	71.88	71.72	71.78	71.75	71.77	71.68	71.50	71.78	71.80
1881	71.85	71.95	71.98	72.00	72.05	72.10	72.13	72.18	72.00	71.90	72.03	72.10
1882	72.33	72.40	72.28	72.25	72.35	72.38	72.45	72.45	72.28	72.13	72.10	72.08
1883	72.13	72.33	72.25	72.23	72.23	72.15	72.15	72.10	72.08	72.00	72.00	72.08
1884	72.23	72.38	72.38	72.35	72.30	72.25	72.25	72.25	72.20	72.15	72.13	72.13
1885	72.18	72.15	72.15	72.13	72.13	72.13	72.13	72.15	72.09	72.10	72.05	72.00
1886	72.13	72.28	72.35	72.40	72.40	71.95	71.85	71.90				71.75
1887	71.57								71.70			
1888	71.75			71.83				71.85	71.80	71.77	71.77	
1889	71.95			72.00						72.12	71.98	72.00

Sources*: 1890–1914: 'Växelkurser NN' (unpublished tables, Sveriges Riksbank).*

Table A6.6. *Monthly exchange rates on Brussels. SEK per 100 francs 1873–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1873			70.95									71.10
1874												
1875										70.90		72.30
1876							71.35					
1877												

Table A6.6 (cont.). *Monthly exchange rates on Brussels. SEK per 100 francs 1873–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1878												
1879												
1880									71.10			
1881							71.00					
1882											71.07	71.10
1883		71.40										
1884												
1885									71.38			71.87
1886						71.95		71.88	71.85			71.60
1887						71.90				71.75		
1888							71.80	71.30				
1889					72.08	72.08			71.75		71.90	71.95
1890	72.11	72.25	72.20	72.15	72.22	72.24	72.25	72.13	71.99	71.91	71.92	71.99
1891	72.06	72.10	72.08	72.05	72.03	71.91	71.85	71.84	71.79	71.76	71.91	71.95
1892	72.02	72.15	72.19	72.16	72.15	72.08	72.15	72.15	72.12	72.06	72.00	72.00
1893	72.08	72.23	72.20	72.22	72.17	72.10	72.05	71.92	71.93	71.99	72.02	72.06
1894	72.17	72.25	72.20	72.02	72.00	71.95	72.00	72.06	71.99	72.00	72.16	72.13
1895	72.15	72.12	72.03	72.05	72.05	71.99	72.04	72.03	71.95	71.95	72.03	71.94
1896	72.02	72.04	72.09	72.12	72.19	72.08	72.05	72.06	72.01	71.95	71.96	71.89
1897	72.02	72.18	72.14	72.11	72.18	72.09	72.10	72.08	72.01	71.94	71.99	71.90
1898	71.98	71.99	71.95	71.95	72.00	71.90	71.99	71.98	71.81	71.87	71.82	71.84
1899	72.21	72.25	72.15	72.15	72.14	72.12	72.11	72.12	72.00	72.00	72.09	72.14
1900	72.32	72.48	72.38	72.41	72.49	72.34	72.41	72.39	72.37	72.44	72.39	72.36
1901	72.41	72.33	72.16	72.07	72.12	71.93	72.00	72.04	71.96	72.02	72.17	72.08
1902	72.17	72.25	72.29	72.26	72.28	72.24	72.24	72.26	72.19	72.20	72.17	72.19
1903	72.36	72.46	72.45	72.40	72.30	72.16	72.18	72.09	72.01	72.18	72.23	72.18
1904	72.29	72.34	72.24	72.28	72.23	72.13	72.12	72.13	72.08	72.15	72.13	72.02
1905	72.15	72.25	72.21	72.21	72.14	72.12	72.19	72.23	72.10	72.08	72.11	72.13
1906	72.32	72.38	72.26	72.26	72.22	72.19	72.17	72.21	72.15	72.15	72.16	72.15
1907	72.21	72.25	72.23	72.28	72.32	72.30	72.28	72.37	72.40	72.55	72.72	72.78
1908	72.75	72.48	72.43	72.40	72.34	72.29	72.12	72.05	72.05	72.07	72.14	72.20
1909	72.27	72.20	72.19	72.17	72.13	72.01	72.09	72.05	72.04	72.12	72.10	72.02
1910	72.05	72.05	72.01	72.04	72.01	71.95	71.96	71.89	71.83	71.77	71.83	71.83
1911	71.90	71.93	71.85	71.77	71.75	71.61	71.67	71.79	71.91	72.09	71.94	71.79
1912	71.90	71.98	71.83	71.81	71.81	71.75	71.84	71.89	71.85	72.01	72.05	71.82
1913	71.95	71.96	71.87	71.96	71.91	71.79	71.83	71.84	71.69	71.75	71.75	71.58
1914	71.74	71.83	71.82	71.97	72.03	71.99	72.13	72.65	72.78	73.00	73.73	

Sources: 1873–89: 'Växelkurser NN' (unpublished tables, Sveriges Riksbank); 1890–1914: *Riksbankens växelkurser på Bruxelles, 1890–1914* (unpublished volume, Sveriges Riksbank).

Appendix A6.6 Quotations on Copenhagen

The Danish courant currency virtually collapsed during the Napoleonic wars, as we have seen earlier. Quotations on Copenhagen were made in skilling banco per Dansk rigsdaler kurant between 1804 and February 1813. After the collapse of the rigsdaler kurant, Denmark adopted a new currency, the silver-based rigsbankrigsdaler, which equalled six rigsdaler kurant. Quotations were made in riksdaler riksmynt per rigsbankrigsdaler after Sweden switched its currency unit in 1858. When Denmark and Sweden formed a Scandinavian Currency Union in 1873 (Norway joined in 1875), Denmark changed to the joint Scandinavian gold-based krone as its official currency. The conversion rate between krone (DKK) and rigsbankrigsdaler was 2:1. Conversion into SEK (kronor) has been based on 1 SEK = 1 riksdaler riksmynt = 32 skilling banco.

Quotations between 1804 and 1889 are from the Stockholm stock exchange and are monthly mid-range observations. The sources are unpublished tables that most likely were the basis for the fifth, statistical volume in Sveriges Riksbank (1931), which in turn was based on daily newspapers. Exchange rates for the period 1882–1914 are cross-calculations of exchange rates on Stockholm and Copenhagen based on end-of-month quotations at the Hamburg stock exchange. The data are bid prices ('geld') from *Hamburger Geld- und Wechsel-Cours im jahre NN. Officielle Ausgabe,* available at Commerzbibliothek at Hamburg stock exchange.

Quotations on bills drawn on Copenhagen in the period 1804–34 are u.s.o. since there is no information on time to maturity.

Table A6.7. *Monthly exchange rates on Copenhagen. SEK per 100 DKK 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1804	322.3	323.4	327.0	325.8	327.0	330.5	331.6	331.6	327.0	328.1	330.5	332.8
1805	335.2	332.8	329.3	332.8	339.8	350.4	353.9	344.5	342.2	336.3	337.5	334.0
1806	336.3	336.3	341.0	341.0	348.4	339.8	342.6	343.8	337.5	338.7	344.5	358.6
1807	346.9	352.7	346.9	343.8	344.5	359.8	353.9	349.2	344.5	344.5	344.5	345.7
1808	349.2	352.7	317.6	321.1	314.1	290.6	295.3	309.4	304.7	300.0	285.9	295.3
1809	288.3	271.9	300.0			234.4	187.5	206.3	208.6	180.5	182.8	175.8
1810	154.7	178.1	171.1	166.4	166.4	189.8	178.1	159.4	157.0	137.1	152.3	168.8
1811	150.0	138.3	150.0	131.3	132.4	133.6	128.9	127.7	119.5	117.2	116.0	113.7
1812	100.8	111.3	110.5	109.0	110.2	105.5	89.1	82.0	70.3	60.9	55.1	50.4
1813	53.9	51.6										
1814			40.6	37.1	34.4	31.6	29.7	26.6	30.5	30.3	30.3	28.9
1815	28.5	27.7	27.3	26.6	27.3	28.4	29.7	27.0		27.5	27.3	27.0
1816	28.1	27.5	27.3	27.1	27.0	28.1	28.9	28.7	27.5	26.9	29.4	32.8
1817	30.0	28.4	26.4	29.8	33.8	37.5						
1818												
1819												
1820												

Table A6.7 (cont.). *Monthly exchange rates on Copenhagen. SEK per 100 DKK 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1821												
1822												
1823												
1824									87.5			
1825												
1826												
1827												
1828						94.5					93.8	
1829												
1830												
1831												
1832												
1833												
1834												102.3
1835	102.3	102.3	102.4	102.0	101.4	99.2	99.0	99.0	99.2	99.6	99.7	99.8
1836	99.6	101.1	100.4	99.9	99.0	98.4	98.1	96.5	97.7	97.5	99.3	101.8
1837	102.1	99.8	99.9	100.2	102.0	100.8	101.6	102.7	100.4	103.9	104.3	104.7
1838	103.6	104.1	104.3	104.7	103.8	104.3	103.8	104.5	104.7	101.6	105.3	105.6
1839	105.3	105.7	105.1	103.1	100.2	102.7	102.3	102.3	100.2	99.8	101.4	104.3
1840	104.7	105.5	103.1	104.3	105.1	105.1	105.1	104.0	104.6	104.8	105.1	105.5
1841	105.1	104.7	105.1	104.4	103.8	103.9	103.6	103.5	104.3	104.2	104.8	106.3
1842	105.5	104.8	104.3	102.0	103.5	103.1	102.9	103.9	102.3	102.0	104.7	104.8
1843	105.1	103.5	104.3	102.5	102.7	100.7	99.7	101.2	102.0	102.0	104.4	104.3
1844	104.7	104.7	104.3	103.9	104.0	103.9	102.7	102.3	101.2	101.0	102.1	102.0
1845	102.2	102.0	100.8	100.7	100.6	100.1	101.0	100.6	101.2	102.3	102.7	104.2
1846	104.7	102.7	102.3	101.6	102.5	101.9	101.3	101.6	102.0	103.3	102.7	103.1
1847	102.7	102.0	102.1	101.2	102.0	101.6	101.6	100.8	101.6	102.0	102.3	102.2
1848	101.6	101.9	102.7	104.7	104.5	103.9	104.7	103.9	102.9	103.5	105.2	105.5
1849	105.5	103.5	102.7	102.7	101.8	102.2	102.1	102.1	101.3	101.6	102.0	102.0
1850	101.4	102.1	102.0	101.2	101.0	100.8	100.5	100.8	100.6	100.6	100.5	100.4
1851	100.8	100.0	100.7	100.4	100.4	99.8	100.4	100.4	100.2	100.4	100.7	101.2
1852	101.4	101.2	101.2	99.5	99.6	100.7	100.4	100.4	100.0	100.4	101.2	100.0
1853	100.4	100.8	99.3	100.0	99.7	100.4	101.2	100.2	100.4	100.8	101.2	101.6
1854	101.8	101.6	102.3	101.6	101.2	101.6	100.8	101.8	102.0	102.7	102.6	103.1
1855	103.7	102.5	103.1	103.3	103.5	103.1	103.3	102.3	102.3	102.3	102.0	102.7
1856	100.4	102.0	102.0	101.2	102.3	102.0	101.6	101.6	100.8	101.2	100.8	102.3
1857	102.7	102.3	102.0	101.6	100.8	100.8	99.6	100.4	100.4	100.8	101.6	101.2
1858	104.3	101.5	102.0	102.0		101.8	101.6	100.3	100.5	101.0	101.8	101.8
1859	101.8	101.5	101.5	100.0	101.3	101.3	100.0	101.0	101.1	101.0	100.9	100.8
1860	101.1	100.9		100.9	102.3	100.0	99.6	100.3	100.3	99.9	100.9	101.0
1861	100.9	100.9	100.5	100.2	100.5	101.0	100.3	99.8	100.8	100.5	100.5	100.8
1862	101.3	101.4	101.3	101.1	100.6	100.0	100.3	100.0	100.0	99.9	100.0	99.9
1863	99.9	100.4	99.7	99.7	99.6	100.0	99.4	99.8	100.0	100.3	100.6	100.8
1864	101.1	100.8	100.8	100.3	99.6	99.9	100.1	100.0	99.7	100.1	100.5	99.9

Table A6.7 (cont.). *Monthly exchange rates on Copenhagen. SEK per 100 DKK 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1865	100.3	99.8	99.5	99.3	99.3	99.5	99.5	99.4	99.6	99.6	99.8	99.9
1866	100.0	100.5	100.4	99.8	100.0	100.5	100.0	99.8	100.5	100.5	100.5	101.0
1867	100.8	100.3	100.5	100.0	100.5	100.5	100.5	100.3	100.5	99.8	100.0	100.1
1868	99.4	100.0	100.5		99.9	100.4	100.3	99.8	100.0	99.9	99.8	100.1
1869	99.8	100.1		99.9	99.1	99.8	99.7	100.0	99.0	99.5	99.9	99.9
1870	99.4	99.3	99.8		100.0	99.5	99.6	99.9	99.5	99.9		
1871					99.5		99.1	99.0	99.3		99.4	99.4
1872	99.1											
1873	98.1	98.1	98.1	98.2	98.3	98.1	98.4	98.5	98.4	98.1	97.9	97.9
1874	99.5	99.8	99.6	99.4	99.6	99.6	99.6	99.6	99.6	99.8		
1875	99.9	99.9	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.8	99.9	99.7
1876	99.7	99.9	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.8		
1877									100.0			
1878				99.9								
1879							100.0		99.7			
1880												
1881												
1882	100.1	100.1	100.1	99.9	99.9	99.9	99.9	100.1	100.1	100.0	100.0	99.9
1883	99.9	99.8	99.9	99.9	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1884	100.0	100.0	100.0	100.0	100.0	100.0	99.9	100.0	100.0	100.0	100.0	100.0
1885	100.1	100.0	100.0	100.0	100.1	100.1	100.1	100.0	100.0	100.0	100.0	100.0
1886	100.0	100.2	100.1	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1887	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.1
1888	100.1	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.1	100.0	100.0
1889	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1890	100.0	100.0	100.0	99.9	99.9	100.0	99.9	99.9	99.9	100.0	100.0	100.0
1891	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1892	99.9	100.0	100.0	100.0	100.0	100.1	100.0	100.0	100.0	100.0	100.0	100.0
1893	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1894	100.0	99.9	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1895	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1896	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1897	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1898	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1899	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1900	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1901	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1902	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1903	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1904	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1905	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1906	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1907	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1908	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table A6.7 (cont.). *Monthly exchange rates on Copenhagen. SEK per 100 DKK 1804–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1909	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1910	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1911	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1912	100.0	99.9	99.9	99.9	100.0	99.9	99.9	100.0	100.0	100.0	100.0	100.0
1913	99.9	100.0	99.9	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9

Sources: 1804–89: 'Växelkurser NN' (unpublished tables, Sveriges Riksbank); 1890–1914: Cross-calculations of data from *Hamburger Geld- und Wechsel-Cours im jahre NN. Officielle Ausgabe.* Commerzbibliothek, Hamburger Börse.

Appendix A6.7 Quotations on Christiania/Oslo

Quotations on Norwegian currency in Sweden were made in riksdaler riksmynt per Norsk specie between 1858 and 1872 and in kronor per Norsk specie in 1873 and 1874. Norway joined the Scandinavian Currency Union in 1875 and adopted the joint Scandinavian gold-based krone as its official currency. The conversion rate between krone (NOK) and Norsk specie was 4:1. Conversion into SEK (kronor) has been based on 1 SEK = 1 riksdaler riksmynt.

Quotations between 1858 and 1882 are from the Stockholm stock exchange and are monthly mid-range observations. The sources are unpublished tables for the fifth, statistical volume in Sveriges Riksbank (1931), based in turn on daily newspapers. Exchange rates for the period 1883–1914 are cross-calculations of exchange rates on Stockholm and Christiania, based on end-of-month quotations at the Hamburg stock exchange. The data are bid prices ('geld') gathered from annual volumes of *Hamburger Geld- und Wechsel-Cours im jahre NN. Officielle Ausgabe,* available at Commerzbibliothek at Hamburg stock exchange.

Table A6.8. *Monthly exchange rates on Christiania/Oslo. SEK per 100 NOK 1858–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1858												101.6
1859												
1860			98.8		100.0				101.0	101.0	101.0	
1861	101.0								100.0		101.0	101.0
1862						101.0	101.0			100.3	100.5	
1863			100.5		99.6	100.0				100.0		100.5
1864	98.8							101.0				
1865		99.9	98.3						99.0		100.0	
1866		100.0	100.0	100.0			100.0					
1867								100.0				
1868												
1869					100.0						100.0	
1870		98.8	98.8		98.3			100.0				
1871												

Table A6.8 (cont.). *Monthly exchange rates on Christiania/Oslo. SEK per 100 NOK 1858–1914.*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1872												
1873	99.5				99.3		98.5					
1874											99.5	
1875												
1876										99.9		
1877						100.0						
1878												
1879										99.1		
1880												
1881					100.0		100.0				100.0	
1882												
1883	100.0	99.9	99.9	99.9	99.8	99.9	99.9	99.9	99.9	99.9	99.9	99.9
1884	99.9	99.9	99.9	99.9	99.9	99.9	99.9	100.0	100.0	100.0	100.0	99.9
1885	99.9	99.9	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1886	99.9	99.9	100.0	99.8	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1887	100.0	100.0	100.0	100.0	99.9	99.9	100.0	100.0	100.0	100.0	100.0	100.0
1888	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1889	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9
1890	99.9	99.9	99.9	99.9	99.9	100.0	99.9	99.9	99.9	100.0	100.0	100.0
1891	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1892	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1893	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1894	100.0	99.9	99.9	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1895	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1896	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1897	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1898	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1899	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1900	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1901	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1902	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1903	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1904	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1905	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1906	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1907	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9
1908	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1909	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1910	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1911	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1912	100.0	100.0	100.0	99.9	100.0	99.9	100.0	100.0	100.0	100.0	100.0	100.0
1913	100.0	100.0	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources: 1858–89: 'Växelkurser NN' (unpublished tables, Sveriges Riksbank); 1890–1914: Cross calculations of data from *Hamburger Geld- und Wechsel-Cours im jahre NN. Officielle Ausgabe.* Commerzbibliothek, Hamburger Börse.

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