

Chapter 7 – Historical exchange rate data 1819–2003

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1. Introduction

On April 15, 1819, exchange rate quotations began on the Christiania Stock Exchange. Prices were quoted twice weekly for bills on London, Hamburg, Amsterdam, Paris and, occasionally, also on Copenhagen and Stockholm.¹ The money market instruments which were used in the foreign exchange transactions did of course change over the 185 year period covered here - from bills of exchange to electronic transfer of bank deposits - but the procedures for quoting exchange rates on the stock exchange remained in principle much the same for 173 years. The quotations were discontinued after August 1991, when the daily publication of ‘representative market rates of exchange’ was left to Norges Bank.²

We have recorded monthly quotations for the most important exchange rates over the 185 year period from 1819 to 2003. With the exception of a few months in 1940 the British pound is continuously recorded over the whole period. The German hyperinflation in 1923-1924 and the collapse of normal financial relations with Germany in the aftermath of WWII create some gaps in the German exchange rate series, but apart from this, the prices of Hamburg banco, the reichsmark and the German mark together cover the whole period. The US dollar was first quoted in September 1914.

2. Exchange rate quotations

There are few measurement problems concerning ‘short’ exchange rates, which can be recorded without further computations. In the nineteenth century a *short* exchange rate is defined here as the price of a demand bill, which was payable at sight (*a vista*), or the price of a three day sight bill.³ The modern equivalent to short rates is the spot rate, which conventionally implies delivery within two working days.⁴ At the end of the 1850s the prices of short bill rates became the standard market quotation for bills on London and Hamburg. However, in the first forty years of our sample period

¹A copy of the first page of the ledger where the exchange rates were recorded is reproduced in Svør (1991).

²See Ramm (1969) and Svør (1991).

³We see that both these instruments were in use as from the late 1850s. Although strictly not identical the implied difference in price is so slight that we make no distinction between these rates here.

⁴See for example chapter 2 of Levi (1996).

there is a mixture of short and long bill prices. The most active markets were generally the ‘long’ bills of exchange (time bills) with maturities of one, two or three months. However, it is important to realize that these bill prices do not represent a short exchange rate series. The recorded prices of time bills must be corrected for the interest component in order to derive a consistent (short) exchange rate series, as explained below.⁵

By purchasing a demand bill on London or Hamburg the buyer would obtain the foreign currency immediately upon presentation of the bill. In the case of a three month time bill the money would only be available three months after presentation of the bill, with the addition of a grace period of three days.⁶ Letting the price of a time bill with d days to maturity be V_d , and the market rate of interest i , the relationship between the short exchange rate (demand bill) S and the time bill price is

$$V_d = S \cdot \left[1 - \frac{i}{100} \cdot \frac{(d+3)}{365} \right]$$

Thus, at a given date the time bill price was always lower than the price of a short bill because of a built-in interest component of the former. The difference is greater the longer the maturity d and the higher the market rate of interest i . Although previously a point of dispute, there is much evidence supporting the practice of using the interest rate in the drawee city (London or Hamburg in our case), where bills are payable, rather than in the drawer city (Christiania).⁷

Turning the expression around we use the following equation for converting time bill prices V_d into a short exchange rate series⁸

$$S = V_d / \left[1 - \frac{i}{100} \cdot \frac{(d+3)}{365} \right]$$

The pound sterling exchange rates are computed from the above formula on the basis of bill prices before May 1859. The interest rate is represented by a short market rate for first class bills in London.⁹ In the case of London three month bills dominated the market. There were two variants of the bills, one time bill payable at three months from the value date (time bill or date bill, *datoveksel* in Norwegian) and a three month sight bill. The price of latter was invariably 2 skilling (say 0.3 per cent) lower than the former, presumably because of the implied effective maturity of the sight

⁵This problem has traditionally been neglected by historians in the case of Norwegian exchange rates in the period 1819 - 1859. In fairness to these authors it may be noted that it is only with the contributions of Davis and Hughes (1960), Perkins (1975) and Offi cer (1996) that the proper distinction between bill prices and exchange rates has been generally acknowledged in the case of dollar-sterling, and that a reasonably accurate short exchange rate series was presented.

⁶Offi cer (1996, p. 61 and p. 295).

⁷This was convincingly argued by Perkins (1975). See Offi cer (1996, p. 69) for a review of these arguments.

⁸All exchange rate data before 1914 have been transcribed from contemporary newspaper sources, chiefly *Morgenbladet* prior to 1891 and *Farmand* thereafter.

⁹The time series was originally published in British Parliamentary Papers, 1857, X, part I, Report from the Select Committee of Bank Activity, pp. 463-464. The data can also be found in the *Economist*, December 27, 1862, pp. 1434-1435 and on the web site of the National Bureau of Economic Research at <http://www.nber.org/databases/macroeconomy/rectdata/13/m13016.dat>. The series was extended by the NBER from June 1857 using the rate of three month banker's bills taken from the *Economist*.

bill would be somewhat longer than the date bill because some days would elapse before the three month maturity period started to run due to the ocean transport to London.¹⁰ During the period from January 1854 to November 1857 one month bills rather than three month bills were most consistently quoted. From then until April 1859 a mixture of bill maturities were quoted; in general, the shortest available maturity was used as the basis for computing the short exchange rate data.¹¹ Beginning May 1859 short rates can be taken directly from the market quotations without further computations.

A similar procedure was adopted for the bills on Hamburg prior to August 1859, when short bill quotations became generally available. Again there are several changes with respect to the maturities most frequently quoted. Three month bills are used as the basis in two short periods: April 1821 - August 1822 and September 1832 - March 1833. Bills on Hamburg specified as 'short sight' was quoted between September 1822 and August 1832, which were used without adjustment. So were the quotations before April 1821, for which details as to maturity was scanty. Finally, one month bills were used as the basis of computations from April 1833 to July 1857.

In the case of Hamburg the difference between one month and three month bills was unchanged for long periods of time. Typically it was 1.5 percentage points in the 1820s and 1830s (when the exchange rate was well above 100), falling to one point in the 1840s and later on as the exchange rate hovered around par.¹² The latter figures are implicitly consistent with a market rate of discount of 5.5 to 6 per cent. To compute the short Hamburg exchange rates the interest factor in the above formula was set to 5 per cent, except for the years 1854 to 1858 when a monthly market rate of discount in Hamburg published in the German translation of Tooke and Newmarch (1859, p. 850) was used.

We only include currencies which were actually quoted in Christiania. Note in particular that there are no official US dollar quotations until September 1914.¹³ If a proximate dollar exchange rate is desired, such a series can easily be computed indirectly by using the dollar-sterling series provided by Officer (2001). The French franc and the Dutch guilder were quoted in Christiania quite regularly from 1881, Belgian franc from July 1898.¹⁴ Other European exchange rates until 1914 can be

¹⁰Between 1823 and 1844 three month sight bill quotations were most frequent. These were increased by 2 skilling to obtain the price of a corresponding time (date) bill.

¹¹For the years 1846 to 1865 the quinquennial reports of the county governor of the city of Christiania to the Ministry of the Interior, published as *Amtmændenes femårsberetninger*, contain monthly averages of bill prices on Hamburg and London. These monthly averages constitute a useful source, which can be used as an alternative series (with proper adjustments) to our end-of-month data. They have been exploited here mainly for the purpose of inferring the prevailing difference between one month and three month bill prices.

¹²On May 29, 1842, bills on Hamburg were quoted at 100.5 at one month, 100 at two months, and 99.5 at three months.

¹³In some periods the commercial banks' bid rate for US dollar was published in the financial press. In the second half of 1892 it appears for the first time in the commercial journal *Farmand*. It was quoted at kroner 3.68 as from June, falling to 3.67 in September 1892. The dollar exchange rate remained at 3.67 or 3.68 throughout the 1890s. US dollar quotations in *Farmand* were discontinued in the early 1900s.

¹⁴Exchange rates on Paris and Amsterdam were less frequently quoted before the 1880s. In 1862 the Stock Exchange Board stated that this was due to few transactions involving these currencies, see Ramm (1969, p. 57). Quotations for the Belgian franc were suspended between February 1915 and December 1918.

derived indirectly from Schneider, Schwarzer and Zellfelder (1991).¹⁵

3. The legal silver standard 1819 - 1842

The law of the monetary standard of 1816 attached the value of the speciedaler to silver. The par value of the speciedaler was specified as one mark fine silver (233.89 g) being equal to 9.25 speciedaler, which is equivalent to saying that one speciedaler contained 25.285 grams of fine silver. The silver value of one speciedaler was equal to that of three Hamburg banco, which was the standard benchmark value of silver currencies at the time.¹⁶ When exchange rate quotations began on April 15, 1819, the key exchange rate quoted was the price of 300 Hamburg banco.¹⁷ Quotations above 100 implied that the market value of the Norwegian speciedaler was below par, which in fact was to be case until April 1842.

The most active commercial bill markets were Hamburg and London. Monthly exchange rates on these two cities are listed in Appendix Table A1.¹⁸ Before 1877 the exchange rates on London were quoted for speciedaler, which was then replaced by the krone at the ratio of one speciedaler equal to four kroner. To preserve the continuity of the exchange rate quotations for sterling the original quotations before 1877 have been multiplied by four. The Hamburg quotations have not been adjusted since they had a par value of 100 and a new currency, the reichsmark, was introduced at the same time as the speciedaler was replaced by the krone. The monthly prices of Norwegian speciedaler as quoted on the Copenhagen Stock Exchange are also included for the years up 1865. In this case the par value was 200 Danish rigsbankdaler per 100 Norwegian speciedaler.

It turned out that the market price of the Norwegian speciedaler was lower than prescribed by the law of 1816 (Hamburg banco was quoted above 100); hence the convertibility of speciedaler into silver at the parity rate had to be suspended until further notice. In 1823 it was decided that the currency notes were to be exchanged for silver species at an adjustable exchange rate fixed by Norges Bank, which was not to be below a minimum rate determined by the Storting.¹⁹ Figure 1 shows how the value of the speciedaler as a percentage of par fluctuated between April 1819 and December 1842.

The silver value of the speciedaler is best measured by taking the inverse of the Hamburg banco short exchange rate.²⁰ A second, but somewhat more indirect, measure is provided by the price of Nor-

¹⁵From 1913 to the present some additional exchange rates (against the US dollar) not provided here are available in electronic form in Offi cer (2002).

¹⁶Keilhau (1952).

¹⁷Occasionally, silver species were also quoted on the Christiania Stock Exchange in the period to 1842. The price of species fluctuated in line with the Hamburg banco, but silver species seem to have been traded at a slightly higher price than the banco (corrected for the interest component) until the first half of 1826.

¹⁸Bill quotations on Amsterdam and Paris or Bordeaux can also be found, but these were far less frequent, so that a continuous series could not be derived for these currencies.

¹⁹See Keilhau (1952) for further details.

²⁰The silver value is computed as 10000/short banco rate. Because the quoted exchange rates are ask (sellers') rates, this

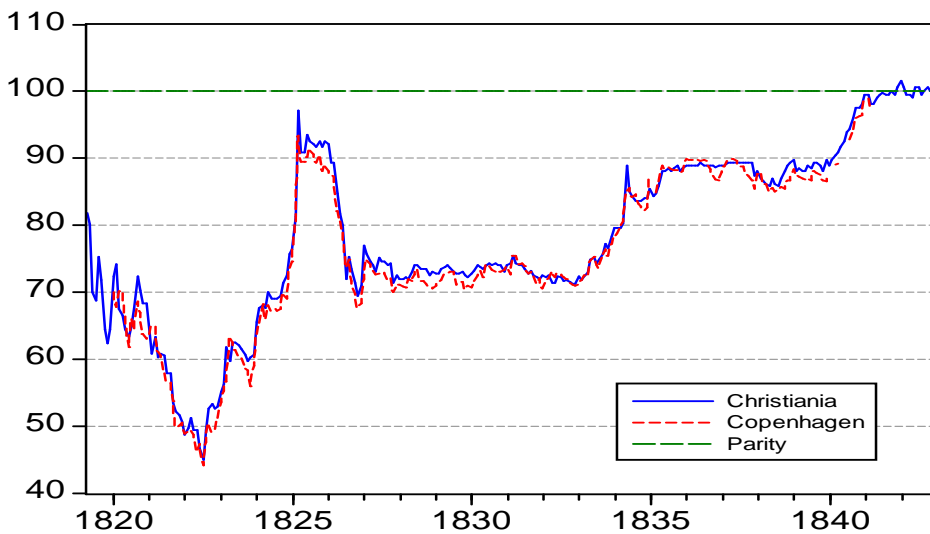


Figure 1: The silver value of the Norwegian speciedaler April 1819 - December 1842

wegian speciedaler notes in Copenhagen relative to the specie value of the Danish rigsbankdaler.²¹ The two measures of the silver value of the Norwegian currency move fairly closely together in this period, as can be seen from Figure 1.

The large fluctuations of the silver value of the Norwegian currency in the 1820s are evident in Figure 1. The currency depreciated, initially somewhat irregularly, towards an all time trough in July 1822, when it was about 45 per cent of its parity. Over the next three years it rebounded strongly, recovering to 93.5 per cent of parity in June 1825. The flourishing timber export trade with Britain, which peaked in 1825, may have been the primary source of the appreciation, but the rising currency value was brought about by some speculative purchases as well.²² When business cycle conditions deteriorated the speciedaler fell back and was stabilized at a level between 70 and 75 per cent of the parity. In 1834 it rose to slightly below 90 per cent, a level which was roughly maintained until the summer of 1840. A new period of appreciation followed, and by January 1841 it was firmly established at a level close to parity, which enabled the Storting to instruct Norges Bank to commence the conversion of notes for silver at the prescribed parity in April 1842. Then the legal silver standard may be said to have been superseded by the effective silver standard.²³

procedure actually renders a bid (buyers') rate series (cf. Levi (1996, p. 52)).

²¹The Danish currency also traded somewhat below parity in this period until its silver value was established at par in 1838. The monthly silver values of the Danish currency have been taken from Rubow (1918).

²²Kristiansen (1925, pp. 150-166), Keilhau (1952, pp. 79-83), Rygg (1918, pp. 278-280).

²³These are the terms used by Keilhau (1952).

4. The effective silver standard 1842 - 1873

This period is characterized by stable exchange rates. Since Britain was on the gold standard the pound sterling exchange rate did of course fluctuate a bit more than the Hamburg banco. Figure 2 graphs the two exchange rates. It was well known by leading contemporary observers that the relationship between the two exchange rates fluctuated in line with the (gold) price of silver. In a report to the Storting in 1873 Professor Broch tabulated the monthly ratios of Hamburg banco to pound sterling quoted in Christiania and the market price of silver in London over the years 1863 to 1872. He found that the exchange rate ratio had followed the fluctuations of the silver price in London with a ‘striking precision’.²⁴

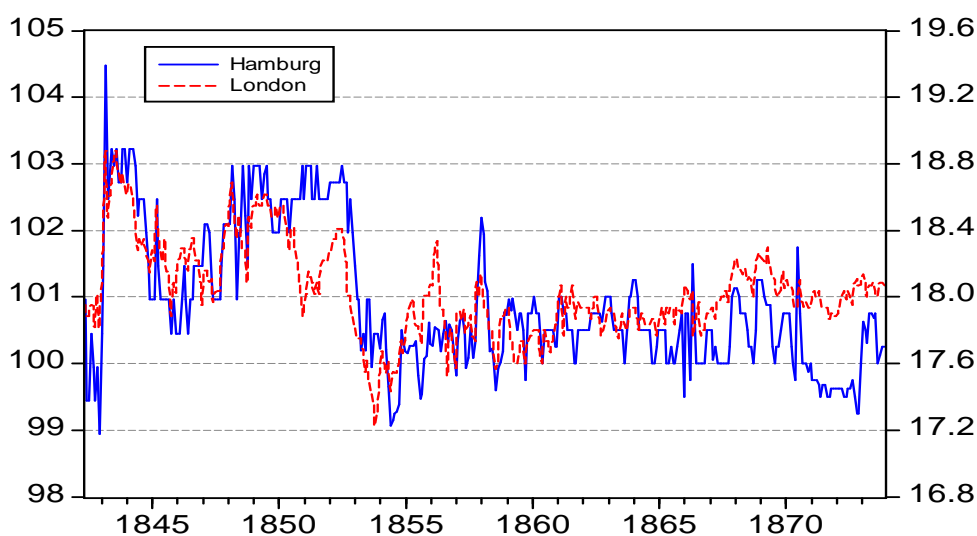


Figure 2: Hamburg banco and pound sterling May 1842 - December 1873

The price of pound sterling was of great commercial interest, but it was the silver currency, Hamburg banco, which was decisive for the functioning of the monetary regime. The exchange rate policy of Norges Bank in the 1840s was severely criticized by the Storting and by several authors for its lack of alertness and understanding of basic market principles.²⁵ At the end of March 1843 Hamburg banco was quoted as high as 104 for one month date bills (equal to 104.47 short). Norges Bank then immediately ceased all lending until late in 1844. In the severe European business cycle recession of 1848 it again ceased to grant new loans. In July 1848 it closed the exchange of notes for silver in Christiania and Bergen, restricting this activity to its head office in Trondhjem only, but raised its ask price for one month bills on Hamburg to 102.5 per cent. These measures may have slowed down

²⁴Norwegian Parliamentary Papers: Appendix to Oth. prp. no. 1 (1873), ‘Særligt Votum fra Professor O. J. Broch’.

²⁵See Keilhau (1952, pp. 100-102) and Rygg (1918, pp. 289-306).

the depletion of the silver stock of Norges Bank, as communications with Trondhjem, particularly at winter time, could be quite hazardous, but they were clearly in violation of the orthodox principles of a metallic standard.²⁶

In 1853 foreign exchange markets became normalized; from now on the short exchange rate on Hamburg rarely deviated more than one per cent from parity, as shown in Figure 2. The 1857-1858 commercial crisis was handled much more professionally by Norges Bank. The establishment of Kongeriget Norges Hypotekbank in 1852 implied that Norges Bank now could allocate somewhat more of its resources to discounting bills. The fierce criticism of the bank's decisions in the 1840s may also have led the board to follow more closely the conditions on European financial markets and strengthened the influence of the Christiania branch.²⁷

5. The gold standard 1874 - 1914

Beginning January 1, 1874, currency notes could be exchanged into gold rather than silver and Norway was effectively on the gold standard.²⁸ The gold standard period lasted until the outbreak of WWI. In 1875 Norway joined Sweden and Denmark in the Scandinavia Monetary Union.²⁹ The unit of account now became the krone, equal to one fourth of a speciedaler. Exchange rates were quoted in kroner as from the beginning of 1877.

In the gold standard period the exchange rates on London and Hamburg remained close to the parities, which were kroner 18.16 for one pound sterling and kroner 88.89 for 100 reichsmarks.³⁰ The exchange rates fluctuated largely within the band set by the costs of transporting gold to or from abroad. The exact position of the gold points is not known, and these may also have changed slowly over time, but Rygg (1954, p. 82) suggests that around 1900 gold export points may be estimated at 18.27 for pound sterling and 89.26 for reichsmarks. Between January 1877 and June 1914, a period of 450 months, it turns out that the pound exchange rate was equal to 18.27 or above in 19 months (about 4 per cent of the time); in the case of the reichsmarks 14 monthly observations above 89.25 were recorded.³¹ But there are only three months, November and December 1907 and March 1913,

²⁶In the first four months of 1849 the exchange rate on Hamburg remained at a high level, close to 103, indicating that the pressure on the bank had not abated. During winter time silver might have to be transported from Trondhjem to southern Norway on ships exposed to winter gales or by means of horse-drawn sleighs if the Christianiafjord was frozen. The board of directors of Norges Bank actually used the fact it was more difficult to transport silver from Trondhjem during the winter as an argument for not moving the head office to Christiania, see Rygg (1918, p. 256). This is perhaps the only example of remoteness being used as an instrument of monetary policy.

²⁷Several times during the century there were political campaigns with a view to move the head office of Norges Bank from Trondhjem to Christiania, but such proposals were resisted by the Storting until 1897.

²⁸Rygg (1954, p. 55).

²⁹See e.g. Bergman, Gerlach and Jonung (1993) and Kærgård and Henriksen (1995, 2003) for a discussion of various aspects of the Scandinavian Currency Union.

³⁰Exchange rates on Hamburg were quoted for reichsmarks beginning January 1877, replacing the old Hamburg banco.

³¹Note that this refers to one end-of-month quotation per month; it is of course possible that the gold points may have been violated earlier in the month. A more elaborate study of this issue would require weekly data.

in which the gold points were violated for both currencies simultaneously. There are two periods of turmoil on foreign financial markets when the exchange rate data suggest that violations of gold points were fairly frequent: December 1899 - January 1900 as well as during most of 1907 and the early months of 1908.³² In both episodes we know that gold was shipped from Norges Bank's domestic gold stock to London.³³

6. Fluctuating exchange rates 1914 - 1939

Table A2 of the appendix contains monthly data beginning in January 1914 for all currencies quoted regularly on the Oslo Stock Exchange.³⁴ In contrast to Table A1, which gave end-of-month quotations, all data in Table A2 are monthly averages of daily quotations.³⁵ We use the present abbreviations GBP and so on for these currencies for the whole period even if there were changes of denominations during the period. In the case of Germany DEM thus refers to reichmarks in the interwar years. Also note that Belgium rebased its currency in November 1926, letting one old franc correspond to 5 new BEF.³⁶ Some currencies were not quoted right from 1914, but were added to the exchange rate list in the following years. The data are mostly taken from the standard Statistics Norway sources, which begin in the years 1917 to 1920 for most currencies except GBP and USD, which go back to 1914.³⁷ However, for a number of currencies it was possible to extend the data series further backwards by computing monthly averages of the daily exchange rate quotations published in Diesen (1922).

On August 5, 1914, Norges Bank suspended the convertibility of notes for gold. The next twenty years represent a dramatic chapter in the history of the international exchange value of the Norwegian krone.

Figure 3 gives an overview of the exchange rate developments of this period. An index of the gold value of kroner is computed from the US dollar quotations in Oslo for the period from September 1914 to the end of 1932, when the United States was on the gold standard. The prewar parity, corresponding to kroner 3.73 per dollar, is set equal to 100.³⁸

³²See Klovland (1995) for more details.

³³Rygg (1954, p. 82).

³⁴After 1940 monthly data on the most important exchange rates are continued in Table A3. The number of currencies listed in Table A3 is reduced compared to Table A2, but exchange rate data for more currencies are available on the web site at <http://www.norges-bank.no>.

³⁵Actually, the data are more precisely defined as monthly averages of quotations on all active trading days of the month. Occasionally these monthly averages will not cover the whole month if trading was suspended.

³⁶To obtain a consistent series for BEF in the 1920s the exchange rate must accordingly be multiplied by a factor of 5 before November 1926.

³⁷The sources are the annual editions of *Statistical Yearbook of Norway*, monthly editions of *Statistiske meddelelser*, *Statistiske oversikter 1926* and *Statistics Norway* (1945). Beginning 1946 these sources were supplemented with data from the *Annual reports of the Oslo Stock Exchange* and the *Annual reports of Norges Bank*. From 1960 the source of all data is Norges Bank.

³⁸The gold index is computed as $100 \cdot 3.73 / S(NOK/USD)$, where the denominator is the actual dollar spot rate.

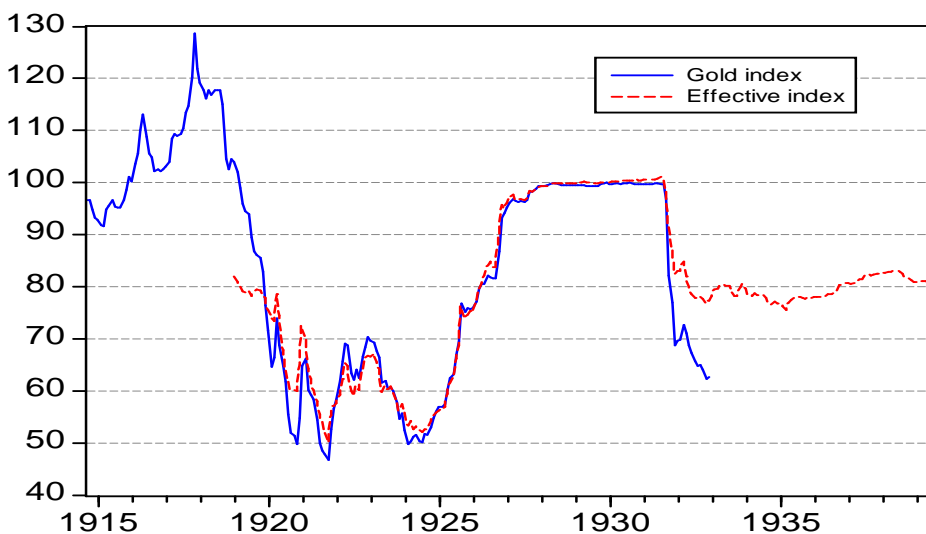


Figure 3: The gold content of the krone and the effective exchange rate 1914 - 1939

An effective exchange rate index for Norwegian kroner (1929 = 100) constructed in Klovland (1998) is also shown for the period beginning in January 1919. The krone index can also be found in Table A2. The weights of this index are derived from the value of bilateral trade in manufactures with 16 countries in 1929, excluding unmanufactured foodstuffs and raw textiles.³⁹ For both indices rising values imply a stronger krone.

After a mild initial depreciation against the pound and the US dollar, the krone was gradually strengthened during 1915, most likely a reflection of the soaring earnings from foreign shipping. After November 1915 the Norwegian krone was stronger than its gold parity, a situation which lasted until March 1919. The figure shows a dramatic fall in the value of the krone from its peak value in November 1917, when the US dollar was quoted at 2.90. From an index value of 128.6 of its parity in November 1917 it fell to 49.8 in November 1920. In October 1921 the krone reached its all-time low of 46.7 per cent of the gold parity. After a temporary dip below 50 again in February 1924 a period of unprecedented appreciation towards the prewar parity followed, which in particular gathered momentum in early 1925.

On May 1, 1928, the krone was back on the gold standard. When the United Kingdom abandoned gold in September 1931 all Scandinavian currencies followed suit. In effective terms, as measured

³⁹The exchange rates are monthly averages of daily quotations for spot exchange rates against US dollars in New York. For other currencies than the USD/NOK rate cross exchange rates (via USD) for NOK were used. Germany is only included beginning November 1924. The index was computed using geometric averages, which imply that the effective weight attached to each country remains invariant to changes in its currency value relative to the base period.

against the trading partners represented in the index, this implied a depreciation of about 20 per cent. After having depreciated somewhat during 1932 the krone was stabilized at kroner 19.90 to the pound as from July 1933, an exchange rate which was fixed until August 1939. The exchange rate policy in the 1930s is thus briefly but adequately summarized by characterizing Norway as an informal member of the sterling block.

7. Non-convertible exchange rates 1940 - 1958

Capital controls had been introduced in several steps during the 1930s, including measures which affected foreign exchange markets. Clearing arrangements were concluded with Germany in 1934 and with some less important European trading partners in the following years.⁴⁰ In March 1940 a currency agreement was made with the United Kingdom which restricted the foreign exchange market to so-called 'special pounds', sold at a fixed price of 17.75 kroner per pound. This currency could only be used for commercial transactions with the British empire.

During the first months after the occupation of Norway in April 1940 a number of measures were taken which ensured that no foreign currency transactions could be undertaken without the consent of Norges Bank. Spot exchange rates were still quoted on the Oslo Stock Exchange, but were equal to the administratively fixed clearing exchange rates.⁴¹ The pound and French franc quotations were suspended during the first war months, but were reintroduced in October 1940.

In principle the system did not change much after the war was over; the monetary authorities held a firm grip on all foreign currency transactions and the level of exchange rates. There was considerable debate concerning the appropriate postwar level of the exchange rate. In the end it was decided to fix the pound exchange rate at 20 kroner.⁴² The most notable event during the following years was the decision once again to follow pound sterling when Britain devalued in September 1949. The dollar exchange rate was raised from 4.97 to 7.15, a devaluation of 43.8 per cent.

The German mark was once again quoted beginning November 1949 at kroner 170.60 per 100 West-German marks, which was fairly close to the level at the end of WWII, kroner 176.75. The currency that showed most variation in this period is the French franc, which depreciated quite much until 1949. In 1960 quotations for new the franc were recorded, being equal to 100 old franc.

Until 1953 the exchange rates were rigidly fixed at the official parities set by the monetary authorities. A limited form of exchange rate flexibility was introduced in December 1953 for the European currencies operating within the arbitrage system of the European Payment Union.⁴³ This system

⁴⁰Rygg (1950, pp. 542-544).

⁴¹The French franc rate deviated somewhat from the clearing rate, see Statistics Norway (1945, p. 116).

⁴²See Norwegian Parliamentary Papers: St.meld. 3 (1945-1946) for a comprehensive discussion of this issue.

⁴³In addition to Norway the countries participating were Britain, France, Sweden, Denmark, Belgium, the Netherlands and

allowed fluctuations within 0.75 per cent of the parity.⁴⁴ In the following years we can therefore observe some slight variations in the exchange rates, except for the US dollar which was still fixed at 7.15. In principle exchange rate quotations were determined by linking the krone to the British pound and the exchange rates against the other EPU members followed the quotations of these currencies against sterling in London. But in practice there was some flexibility in the pound exchange rate; when there was pressure against sterling it was allowed to drop slightly below the parity of 20 kroner. In such episodes Norges Bank aimed at keeping the krone close to the parities of Swedish kronor and German marks.⁴⁵

At the end of 1958 Norway followed the decision of Britain and many other European countries and made the currency partly convertible.⁴⁶ A practical consequence of the extended convertibility was that US dollar quotations were no longer rigidly fixed at kroner 7.15 per dollar. Norwegian authorities could now in principle choose within the 0.75 per cent bands on either side of the parity which currency to peg; the relevant alternatives were the pound or the dollar.⁴⁷ In practice it seems that the krone essentially still followed the pound, but if the pound fluctuated much against the dollar the krone did not follow the pound all the way.⁴⁸

8. The period 1959 to the present

Modern exchange rate quotations present no problems of measurement and interpretation - in strong contrast to the fundamental problems of understanding their fluctuations. The history of exchange rate regimes is also fairly well known, and has been treated in more detail elsewhere than can be done here.⁴⁹ In appendix table A3 only the most important exchange rates are printed (but can be found on the web site) - GBP, USD, SEK, DEM, FRF and the EU currencies, ECU (coded as XEU) until December 1999, and the euro (EUR) thereafter. Quotations for DEM and FRF are discontinued after February 2002. On the accompanying web site additional exchange rate quotations for a number of currencies can be found.

Switzerland.

⁴⁴See the Annual Report of Norges Bank 1953, pp. 40-41.

⁴⁵This is explicitly stated in the Annual Report of Norges Bank 1956, p. 24.

⁴⁶In addition to the members of the previous arbitrage system of the EPU (see above) the currencies of Italy, Austria and Portugal were now freely determined. There were still restrictions on financial transactions and bilateral currency agreements with a number of countries. See the Annual Report of Norges Bank 1958, pp. 63-68.

⁴⁷Norway reported to the International Monetary Fund that the band against the US dollar was to be between kroner 7.09 and 7.20, or about 0.75 per cent on either side of the parity. Since most other countries also declared a similar band against the dollar, including Britain, the krone exchange rate against these currencies could theoretically fluctuate within a band of plus or minus 1.5 per cent of the parity.

⁴⁸See Oslo Stock Exchange report for the year 1959, pp. 168-170 (Oslo Børs: Økonomisk beretning for året 1959).

⁴⁹See e.g. Alstadheim (1995) and Norges Bank (1989, 1995) for an overview of Norway's exchange rate policy until the mid 1990s. An effective annual exchange rate index for the Norwegian krone covering the postwar years up to 1986 can be found in Klovland (1987).

9. Two centuries of exchange rates

We end this chapter by presenting a graph of the price of pound sterling extending over nearly two centuries. Figure 4 shows nominal and real exchange rates of the Norwegian speciedaler and krone against the British pound over the 185 years from 1819 to 2003. The real exchange rate is computed as

$$R = \frac{S \cdot P_{UK}}{P_{NOR}}$$

where S is the nominal spot exchange rate and P_{NOR} and P_{UK} are price indices for Norway and the United Kingdom, respectively. For Norway we use the consumer price index constructed by Grytten (2004). For Britain the cost of living indices constructed by Feinstein (1998, 1991) for the century before WWI have been spliced with the official cost of living or consumer prices index after 1914.⁵⁰ We note that if the real exchange rate remains constant through time the nominal exchange rate behaviour is consistent with the principle of purchasing power parity.⁵¹

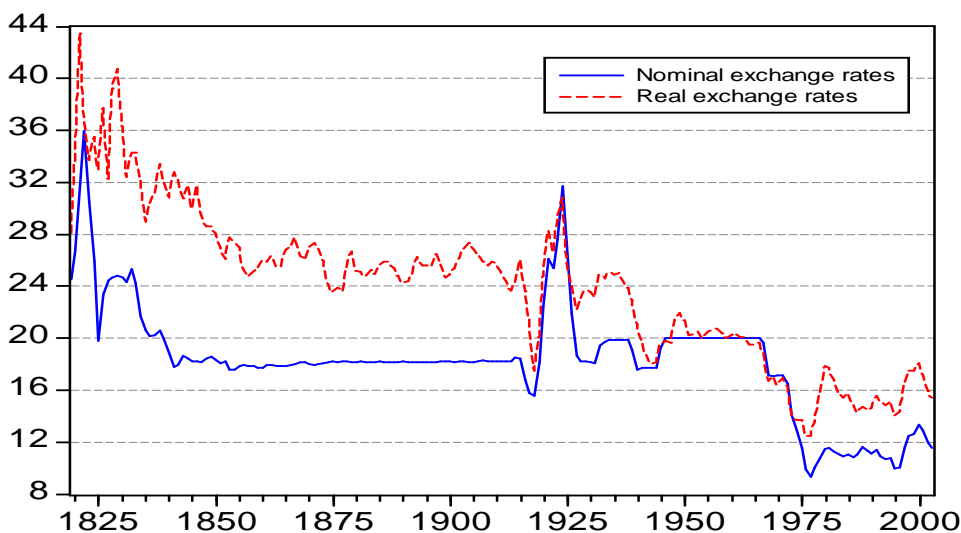


Figure 4: Nominal and real exchange rates against the British pound 1819 - 2003

Britain has been Norway's most important trading partner when these two centuries are viewed as a whole. The relative constancy of the nominal exchange rate against the pound during substantial periods is evident from Figure 4. The initial appreciation of the Norwegian speciedaler towards

⁵⁰The UK cost of living index for the years 1914 to 1988 has been taken from Mitchell (1998). Thereafter we have used the consumer prices index from the web site of Statistics UK at <http://www.statistics.gov.uk/CCI>. The various price series having different base years were spliced by the simple ratio method in an overlapping year and finally rebased to 1959 = 100 to make it comparable to the Norwegian index.

⁵¹Akram (2002) has shown that the PPP principle has considerable explanatory power in the case of the long-run effective exchange rate index over the years from 1972 to 1997.

silver parity after 1819 and the disruptions following WWI stand out as the most volatile periods. Beginning with the classical gold standard period and well into the post-WWII period the underlying notion of exchange rate stability in Norway was indeed defined with reference to the British pound. Britain's devaluation in 1967 and Norway's vain attempts at obtaining nominal exchange rate stability by attaching the krone to continental European exchange rate mechanisms from the 1970s mark a break with this principle.

Both nominal and real krone-pound exchange rates have appreciated over these years. The comparison of national price levels over two centuries is of course associated with a number of measurement problems, changes in indirect taxation and so on, which implies that movements in the real exchange rate curve should be interpreted with utmost caution. But if the broad outlines are approximately correct, the overall picture is one of extended periods of both nominal and real exchange rate stability, but interrupted by structural breaks, which establish the real rate at a new level.⁵² Between the mid-1850s and the late 1930s the long-run level of the real exchange rate is fairly constant, which is quite remarkable. The Second World War is accompanied by a transition to a lower level and the 1970s see a further real appreciation of the krone. But there is a clear tendency towards more stability in the real rate than in the nominal exchange rate in the postwar era, although the nominal appreciation against sterling goes further than implied by the relatively higher level of inflation in Britain than in Norway.

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⁵²Edison and Klovland (1987) found that real factors such as productivity differentials were important determinants of the real krone-pound exchange rate over the period 1870 to 1970.

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A. Technical appendix: The data

Table A1. Exchange rates monthly 1819 - 1914

End-of-month quotations at Oslo Stock Exchange, Norwegian speciedaler in Copenhagen

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1819												
London				19.73	20.73	23.44	24.94	23.04	25.04	27.65	28.45	27.45
Hamburg banco				122.28	124.79	142.83	145.34	132.81	139.32	155.36	160.37	155.36
1820												
London	24.64	24.34	25.64	26.24	26.98	28.65	28.05	27.45	26.04	26.64	27.45	27.91
Hamburg banco	138.32	134.81	148.09	150.35	155.36	157.87	153.86	147.84	138.32	142.33	146.34	146.34
Speciedaler Cop.	200.00	185.00	185.00	185.00	170.00	157.50	170.00	168.75	177.50	172.50	163.75	162.50
1821												
London	29.05	30.05	28.85	30.05	30.05	32.05	32.05	31.65	34.06	34.96	35.04	35.16
Hamburg banco	154.86	164.38	157.87	166.12	164.60	165.10	172.70	172.70	187.39	191.44	193.46	197.52
Speciedaler Cop.	165.00	170.00	168.75	160.00	158.75	153.75	150.00	147.50	140.00	130.00	126.88	125.63
1822												
London	36.86	36.86	34.59	36.46	36.46	38.46	40.05	36.05	34.45	34.45	34.18	32.44
Hamburg banco	205.62	201.57	195.49	202.58	202.58	214.74	222.84	202.58	190.00	187.50	190.00	189.00
Speciedaler Cop.	123.13	125.00	125.63	123.75	117.50	119.38	110.63	119.38	126.88	124.38	127.50	127.50
1823												
London	32.71	32.64	29.71	31.31	28.17	29.71	29.77	30.11	30.17	30.91	30.51	30.11
Hamburg banco	181.50	178.00	162.00	167.50	160.00	160.00	161.00	162.50	165.00	167.50	166.00	165.00
Speciedaler Cop.	133.75	138.75	140.00	157.50	156.25	153.25	151.25	150.63	147.50	145.63	140.00	147.50
1824												
London	27.43	26.76	26.63	26.83	25.83	26.10	26.00	26.00	25.76	25.16	24.29	23.63
Hamburg banco	152.50	148.00	147.00	148.00	143.00	145.00	145.00	145.00	144.00	140.00	138.00	132.00
Speciedaler Cop.	157.50	162.50	170.63	165.00	170.00	160.00	160.63	160.00	160.63	166.25	157.50	163.75
1825												
London	23.16	22.09	18.15	19.29	19.62	19.09	19.29	19.29	19.53	19.29	19.30	19.30
Hamburg banco	131.00	123.00	103.00	110.00	110.00	107.00	108.00	108.50	109.00	108.00	109.00	108.00
Speciedaler Cop.	165.63	178.13	202.50	195.00	193.13	191.25	194.75	192.00	189.50	190.00	185.75	188.00
1826												
London	19.30	20.23	20.63	21.44	22.30	23.03	25.70	24.63	25.17	25.70	26.50	25.97
Hamburg banco	108.50	112.00	112.00	118.00	122.50	125.00	139.00	132.75	136.00	140.00	144.00	141.00
Speciedaler Cop.	191.00	196.50	205.00	189.50	186.00	181.50	169.75	170.75	164.00	159.00	155.00	155.00
1827												
London	23.30	24.23	24.70	24.56	25.10	24.56	24.42	24.29	24.29	24.14	25.12	24.49
Hamburg banco	130.00	132.00	134.00	135.00	137.00	133.00	134.00	134.00	135.00	134.50	140.00	138.00
Speciedaler Cop.	164.75	171.50	169.75	167.25	164.25	163.63	163.50	163.00	158.25	158.25	154.75	154.75
1828												
London	24.69	24.96	24.62	24.96	24.56	24.42	24.49	24.62	24.69	24.42	24.91	24.76
Hamburg banco	139.00	139.00	138.50	139.00	137.00	135.00	135.00	136.00	136.00	136.00	138.00	137.00
Speciedaler Cop.	156.50	155.25	155.50	159.00	156.75	157.75	158.75	154.75	153.50	150.25	147.75	146.75
1829												
London	24.70	24.63	24.63	24.53	24.49	24.63	24.90	24.89	24.82	24.76	25.43	25.36
Hamburg banco	137.50	137.50	136.00	135.50	135.00	135.75	137.00	137.50	137.50	137.00	138.00	138.50
Speciedaler Cop.	149.00	149.50	150.00	151.50	152.00	152.75	151.25	149.25	148.75	148.75	147.75	147.75
1830												
London	25.16	25.16	25.09	24.89	24.82	24.69	24.55	24.42	24.09	24.09	24.42	24.43
Hamburg banco	137.50	136.50	135.00	135.50	136.00	135.00	134.50	135.00	134.50	135.00	135.00	137.00
Speciedaler Cop.	147.75	149.25	151.75	153.75	152.50	154.50	154.00	153.63	153.25	154.50	154.75	154.75
1831												

Table A1. Exchange rates monthly 1819 - 1914

End-of-month quotations at Oslo Stock Exchange, Norwegian speciedaler in Copenhagen

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
London	24.09	24.09	23.83	24.16	24.06	24.10	24.37	24.56	24.49	24.63	24.83	24.97
Hamburg banco	135.00	134.50	132.50	134.50	135.00	135.00	136.00	137.50	136.75	138.00	138.50	139.00
Speciedaler Cop.	157.75	154.00	157.50	157.75	155.75	155.25	155.25	154.25	154.00	154.25	152.00	151.25
1832												
London	24.77	25.16	25.16	25.36	25.49	25.36	25.29	25.49	25.49	25.42	25.36	25.56
Hamburg banco	138.00	138.50	138.00	140.00	140.00	138.25	138.50	139.50	139.27	139.78	140.29	140.29
Speciedaler Cop.	148.75	151.25	152.00	153.50	151.75	152.00	153.00	152.25	151.75	151.50	150.75	149.75
1833												
London	25.16	25.42	25.15	24.75	24.22	24.25	24.35	24.29	23.62	23.29	23.23	22.76
Hamburg banco	138.26	139.27	138.26	137.12	133.60	133.10	134.61	133.60	132.10	129.59	130.59	127.58
Speciedaler Cop.	150.25	152.00	153.25	152.75	157.25	157.00	154.75	154.50	157.75	159.25	156.00	159.00
1834												
London	22.43	22.69	22.55	22.09	21.56	21.02	21.19	21.42	21.43	21.29	21.29	21.29
Hamburg banco	125.57	125.57	125.57	124.56	112.51	117.53	118.54	119.54	119.54	119.54	119.04	119.04
Speciedaler Cop.	161.50	163.00	164.75	166.75	176.00	176.75	173.75	175.00	172.75	171.75	170.50	170.75
1835												
London	20.83	21.16	21.16	20.83	20.09	20.36	20.29	20.59	20.29	20.49	20.49	20.36
Hamburg banco	117.03	118.54	118.03	116.53	113.51	113.51	113.01	113.51	113.01	112.51	113.51	113.01
Speciedaler Cop.	180.00		175.75	178.75	184.00	182.00	182.25	181.00	180.00	179.25	178.25	177.00
1836												
London	20.29	20.29	20.36	20.42	20.29	20.03	20.23	20.16	20.10	19.97	20.04	19.97
Hamburg banco	112.51	112.51	112.51	112.51	112.51	112.01	112.51	112.51	112.51	112.51	112.76	112.51
Speciedaler Cop.	181.50	181.25	181.25	181.25	181.00	181.00	181.25	180.88	178.50	176.50	175.50	174.75
1837												
London	20.14	20.10	20.10	20.30	20.16	20.16	20.26	20.36	20.36	20.36	20.22	20.62
Hamburg banco	112.51	112.51	112.01	112.01	112.01	112.01	112.01	112.01	112.01	112.01	112.01	114.52
Speciedaler Cop.	177.75	179.25	181.00	181.50	181.50	181.00	179.25	179.25	178.00	176.50	175.00	172.50
1838												
London	20.42	20.82	20.95	20.95	21.08	20.62	20.75	20.82	20.62	20.42	20.09	19.82
Hamburg banco	113.51	115.02	115.52	116.02	116.53	115.02	116.02	116.53	115.02	113.51	112.51	112.01
Speciedaler Cop.	177.00	177.25	174.00	174.00	171.75	173.00	171.75	171.50	171.50	171.00	173.25	173.25
1839												
London	19.69	20.09	20.09	20.16	20.09	19.97	19.97	19.71	19.81	19.78	20.04	19.71
Hamburg banco	111.50	113.51	113.01	113.51	113.51	112.51	113.01	112.01	112.01	112.51	113.51	111.50
Speciedaler Cop.	176.75	174.75	174.50	174.00	173.50	173.75	173.26	176.25	175.50	174.75	173.25	173.00
1840												
London	19.91	19.83	19.70	19.56	19.29	18.96	18.76	18.63	18.36	17.90	17.90	17.97
Hamburg banco	112.51	111.50	110.50	110.00	108.99	107.99	106.48	105.98	104.22	102.46	102.46	101.96
Speciedaler Cop.	175.00		178.00	178.50				185.75	187.50	192.00	192.50	193.00
1841												
London	17.63	17.76	18.03	18.09	17.89	17.76	17.83	17.63	17.76	17.70	17.70	17.76
Hamburg banco	100.45	100.45	101.96	101.96	100.96	100.45	100.20	100.45	100.45	99.95	100.45	99.45
Speciedaler Cop.	197.25	198.00	195.25				198.50		197.00			
1842												
London	17.59	17.89	18.16	18.16	17.95	17.89	17.89	17.95	17.95	17.82	18.01	17.81
Hamburg banco	98.45	99.45	100.45	100.45	100.96	99.45	99.45	100.45	99.95	99.45	99.95	98.95
1843												
London	18.08	18.28	18.88	18.48	18.61	18.68	18.81	18.88	18.75	18.68	18.75	18.68
Hamburg banco	100.45	101.46	104.47	102.46	102.97	103.22	102.97	103.22	102.71	102.71	103.22	103.22
1844												

Table A1. Exchange rates monthly 1819 - 1914

End-of-month quotations at Oslo Stock Exchange, Norwegian speciedaler in Copenhagen

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
London	18.61	18.68	18.68	18.61	18.48	18.28	18.35	18.31	18.35	18.28	18.22	18.15
Hamburg banco	102.71	103.22	103.22	103.22	102.97	102.21	102.46	102.46	102.46	101.96	101.46	100.96
Speciedaler Cop.							193.50	193.38	195.50		196.25	
1845												
London	18.28	18.21	18.55	18.42	18.28	18.22	18.35	18.15	18.15	17.88	18.09	18.03
Hamburg banco	100.96	100.96	102.46	101.46	100.96	100.96	100.96	100.96	100.96	100.45	100.96	100.45
Speciedaler Cop.					198.50	197.50	198.00				193.75	192.50
1846												
London	18.16	18.23	18.29	18.29	18.22	18.16	18.29	18.36	18.35	18.22	18.22	18.09
Hamburg banco	100.45	100.45	100.96	101.46	100.96	100.45	100.96	100.96	101.46	101.46	101.46	101.46
Speciedaler Cop.	196.25	198.50	198.00	197.25	198.50	197.63	197.25	197.50	196.25	194.75	193.00	192.00
1847												
London	17.95	18.16	18.16	18.09	18.11	17.97	18.03	18.04	18.04	18.24	18.29	18.44
Hamburg banco	101.46	102.09	102.09	101.96	101.21	100.96	100.96	100.96	100.96	101.46	102.09	102.09
Speciedaler Cop.	195.50	195.50	194.75	195.88	196.00	196.75	197.00	197.00	196.75	196.75	196.50	193.75
1848												
London	18.43	18.55	18.69	18.49	18.35	18.49	18.42	18.28	18.28	18.08	18.48	18.42
Hamburg banco	102.09	102.09	102.97	102.46	100.96	101.96	101.96	102.97	102.21	101.46	102.97	102.46
Speciedaler Cop.	195.25	195.63	194.38	194.00	194.25	193.50	197.25	197.00	193.00	193.33	192.00	193.00
1849												
London	18.55	18.55	18.61	18.55	18.55	18.61	18.61	18.55	18.55	18.48	18.48	18.55
Hamburg banco	102.97	102.97	102.97	102.97	102.46	102.84	102.97	102.46	102.46	101.96	101.96	101.96
Speciedaler Cop.	194.50	196.25	196.00	194.50	195.88	193.75	195.00	195.00	194.75	195.25	195.75	194.75
1850												
London	18.48	18.55	18.55	18.48	18.41	18.28	18.41	18.41	18.28	18.21	18.08	17.95
Hamburg banco	101.96	102.46	102.46	102.46	102.46	101.96	102.46	102.46	102.46	102.46	102.46	102.97
Speciedaler Cop.	195.13	195.56	197.00	195.13	195.75	197.50	198.13	197.63	198.50	197.13	197.13	197.13
1851												
London	17.89	18.02	18.15	18.12	18.08	18.02	18.08	18.02	18.15	18.22	18.22	18.22
Hamburg banco	102.46	102.97	102.97	102.97	102.46	102.46	102.97	102.46	102.46	102.46	102.46	102.46
Speciedaler Cop.	198.13	198.00	197.25	198.25	198.13	197.50	198.00	197.50	197.75	197.50	197.13	197.13
1852												
London	18.28	18.28	18.35	18.35	18.41	18.41	18.41	18.34	18.21	18.01	18.01	17.88
Hamburg banco	102.71	102.71	102.71	102.71	102.71	102.71	102.97	102.71	102.71	101.96	102.46	101.96
Speciedaler Cop.				197.25	197.25	198.50	199.63	198.50	199.13	197.75	197.00	197.13
1853												
London	17.81	17.75	17.75	17.75	17.68	17.55	17.62	17.49	17.42	17.36	17.23	17.30
Hamburg banco	101.46	100.96	100.96	100.20	100.45	100.20	100.96	100.96	99.95	100.45	100.45	100.45
Speciedaler Cop.	197.25	197.13	197.75	198.13	199.50	200.13	200.13	200.00	198.25	198.63	198.13	197.13
1854												
London	17.54	17.67	17.60	17.54	17.61	17.43	17.55	17.54	17.54	17.60	17.74	17.66
Hamburg banco	100.23	100.66	100.75	100.20	99.66	99.06	99.16	99.25	99.27	99.38	100.50	100.36
Speciedaler Cop.	197.50	198.00	197.75	197.25	197.13	198.38	196.88	198.75	198.38	197.38	195.75	193.63
1855												
London	17.74	17.88	17.95	17.98	17.97	17.83	17.82	17.76	17.72	18.01	18.01	18.01
Hamburg banco	100.18	100.16	100.27	100.27	100.27	100.34	99.82	99.47	99.54	100.07	100.11	100.61
Speciedaler Cop.	193.63	195.00	195.25	195.38	195.38	195.25	195.50	197.13	198.25	198.25	197.63	196.38
1856												
London	18.07	18.07	18.27	18.34	18.19	17.94	17.93	17.80	17.53	17.74	17.80	17.66
Hamburg banco	100.29	100.27	100.55	100.51	100.50	100.18	100.45	100.64	100.32	100.59	100.50	100.13

Table A1. Exchange rates monthly 1819 - 1914

End-of-month quotations at Oslo Stock Exchange, Norwegian speciedaler in Copenhagen

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Speciedaler Cop. 1857	196.88	199.00	199.88	200.00	200.00	200.50	200.25	199.88	200.75	199.50	199.38	196.63
London	17.57	17.91	17.91	17.86	17.92	17.78	17.83	17.89	17.76	17.73	18.09	18.00
Hamburg banco	99.83	100.34	100.64	100.73	100.45	99.93	100.08	100.55	100.09	100.34	100.91	101.62
Speciedaler Cop. 1858	198.00	199.50	200.00	198.50	199.00	200.00	200.50	200.50	200.75	200.38	198.38	199.50
London	18.13	18.00	17.93	17.93	17.80	17.80	17.73	17.57	17.60	17.87	17.87	17.89
Hamburg banco	102.18	101.93	101.23	101.09	100.18	100.23	100.09	99.59	99.93	100.02	100.18	100.77
Speciedaler Cop. 1859	195.38	197.25	199.75	198.75	198.63	200.00	199.63	200.38	200.25	200.13	198.63	199.13
London	17.93	17.93	17.73	17.73	17.60	17.60	17.67	17.73	17.73	17.60	17.73	17.77
Hamburg banco	100.73	100.96	100.80	100.98	100.75	100.50	100.75	100.75	100.50	99.75	100.75	100.75
Speciedaler Cop. 1860	199.25	198.88	198.88	198.88	198.00	198.13	199.88	200.38	199.88	200.13	198.75	198.88
London	17.77	17.80	17.80	17.80	17.67	17.60	17.80	17.73	17.73	17.67	17.73	17.83
Hamburg banco	100.75	101.00	100.75	100.75	100.50	100.00	100.50	100.50	100.50	100.50	100.50	100.25
Speciedaler Cop. 1861	197.88	198.88	199.63	199.00	198.25	198.88	200.13	199.63	199.88	199.38	198.63	199.13
London	17.83	18.00	18.07	17.77	18.00	17.93	17.93	18.07	17.93	17.87	17.97	17.93
Hamburg banco	100.25	101.00	101.00	100.75	100.75	100.50	100.50	100.50	100.00	100.00	100.50	100.50
Speciedaler Cop. 1862	199.00	199.75	199.25	198.63	198.50	199.13	199.63	200.50	200.13	199.75	199.50	199.38
London	17.93	17.93	17.93	17.93	17.87	17.93	18.00	18.00	17.87	17.77	17.80	17.83
Hamburg banco	100.50	100.50	100.50	100.50	100.75	100.75	100.75	100.75	100.75	100.63	100.75	101.00
Speciedaler Cop. 1863	199.38	199.50	199.38	199.63	200.25	199.63	200.63	200.38	199.25	199.88	199.88	199.50
London	17.90	17.93	17.90	17.90	17.82	17.75	17.83	17.90	17.83	17.80	17.87	17.93
Hamburg banco	101.00	101.00	100.75	100.50	100.50	100.50	100.50	100.50	100.00	100.50	101.00	101.00
Speciedaler Cop. 1864	198.63	199.63	199.25	199.50	200.00	199.88	200.38	200.13	200.25	200.00	199.13	198.13
London	17.93	17.93	17.87	17.80	17.90	17.87	17.83	17.83	17.83	17.87	17.87	17.77
Hamburg banco	101.25	101.25	101.00	100.50	100.50	100.50	100.50	100.50	100.50	100.00	100.00	100.25
Speciedaler Cop. 1865	197.75	197.63	197.63	199.13	199.75	200.13	200.13	200.13	200.13	200.25	199.75	199.63
London	17.82	17.87	17.93	17.83	17.93	17.90	17.93	17.93	17.83	17.93	17.92	17.90
Hamburg banco	100.50	100.50	100.50	100.50	100.00	100.00	100.25	100.00	100.00	100.25	100.50	100.75
Speciedaler Cop. 1866	199.88	200.13	200.63	200.38	200.38	200.38	200.63	200.38	200.00	200.38	200.13	200.00
London	18.00	18.07	18.03	17.98	18.03	17.77	17.87	17.97	17.77	17.80	17.80	17.90
Hamburg banco	99.50	100.75	100.75	99.75	101.50	101.00	100.00	100.00	100.00	100.00	100.00	100.50
Speciedaler Cop. 1867	199.88	200.13	200.63	200.38	200.38	200.38	200.63	200.38	200.00	200.38	200.13	200.00
London	17.90	17.93	17.93	17.87	17.97	17.97	18.00	18.00	18.03	17.97	18.03	18.13
Hamburg banco	100.50	100.50	100.06	100.25	100.00	100.00	100.00	100.00	100.00	100.00	100.25	101.00
Speciedaler Cop. 1868	199.88	200.13	200.63	200.38	200.38	200.38	200.63	200.38	200.00	200.38	200.13	200.00
London	18.20	18.23	18.17	18.17	18.13	18.17	18.10	18.12	18.10	18.00	18.17	18.23
Hamburg banco	101.13	101.13	101.00	100.75	100.75	100.75	100.50	100.25	100.25	100.00	100.50	101.25
Speciedaler Cop. 1869	199.88	200.13	200.63	200.38	200.38	200.38	200.63	200.38	200.00	200.38	200.13	200.00
London	18.27	18.23	18.22	18.20	18.30	18.20	18.13	18.10	18.02	18.00	18.04	18.15
Hamburg banco	101.25	101.25	101.00	100.88	100.88	100.88	100.25	100.00	100.25	100.25	100.50	100.75
Speciedaler Cop. 1870	199.88	200.13	200.63	200.38	200.38	200.38	200.63	200.38	200.00	200.38	200.13	200.00

Table A1. Exchange rates monthly 1819 - 1914

End-of-month quotations at Oslo Stock Exchange, Norwegian speciedaler in Copenhagen

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
London	18.05	18.10	18.07	18.07	18.03	17.93	17.93	18.10	17.97	17.94	17.97	17.93
Hamburg banco	100.75	100.75	100.75	100.25	100.00	99.75	101.75	100.75	100.00	100.00	100.00	99.88
1871												
London	17.93	17.98	18.03	18.00	18.03	18.00	17.93	17.93	17.93	17.87	17.90	17.88
Hamburg banco	100.00	99.75	99.75	99.75	99.68	99.50	99.68	99.68	99.50	99.50	99.63	99.63
1872												
London	17.88	17.90	17.92	17.98	18.03	17.98	18.03	18.00	17.95	18.08	18.11	18.07
Hamburg banco	99.63	99.63	99.63	99.63	99.50	99.50	99.63	99.63	99.75	99.50	99.25	99.25
1873												
London	18.08	18.13	18.08	18.00	18.07	18.07	18.08	18.03	18.00	18.08	18.08	18.07
Hamburg banco	100.00	100.63	100.50	100.31	100.75	100.75	100.69	100.75	100.00	100.13	100.25	100.25
1874												
London	18.07	18.13	18.12	18.10	18.08	18.07	18.13	18.13	18.10	18.15	18.23	18.23
Hamburg banco	100.50	100.38	100.25	100.25	100.00	99.75	99.88	99.88	99.75	100.00	100.25	100.25
1875												
London	18.23	18.27	18.30	18.28	18.30	18.12	18.23	18.05	18.12	18.07	18.15	18.11
Hamburg banco	100.00	100.00	100.25	99.88	99.63	99.00	100.13	100.25	100.25	100.25	100.25	100.31
1876												
London	18.20	18.23	18.20	18.10	18.13	18.08	18.13	18.15	18.10	18.10	18.10	18.20
Hamburg banco	100.25	100.25	100.00	100.00	99.75	99.50	99.88	99.88	99.88	99.88	99.88	100.25
1877												
London	18.22	18.24	18.20	18.15	18.18	18.20	18.18	18.20	18.24	18.20	18.24	18.20
Hamburg reichm.	89.15	89.15	89.05	88.80	88.80	88.80	89.00	89.10	89.24	89.20	89.25	89.25
1878												
London	18.23	18.24	18.18	18.16	18.18	18.15	18.16	18.25	18.24	18.24	18.24	18.24
Hamburg reichm.	89.25	89.25	89.15	89.00	89.00	89.15	89.20	89.25	89.25	89.10	89.25	89.25
1879												
London	18.18	18.22	18.24	18.16	18.16	18.12	18.15	18.15	18.17	18.13	18.15	18.12
Hamburg reichm.	89.20	89.10	88.95	88.80	88.80	88.75	88.75	88.70	88.80	89.10	89.15	89.10
1880												
London	18.12	18.13	18.13	18.11	18.14	18.13	18.16	18.16	18.15	18.15	18.12	18.12
Hamburg reichm.	89.05	88.80	88.65	88.70	88.75	88.75	88.75	88.75	89.00	89.00	88.90	88.90
1881												
London	18.18	18.21	18.21	18.22	18.19	18.17	18.19	18.21	18.18	18.20	18.18	18.20
Hamburg reichm.	89.05	89.00	88.90	88.90	88.85	88.90	88.85	88.95	89.05	89.10	89.10	89.20
Paris	71.75	71.90	71.80	71.85	71.95	71.85	72.05	71.90	71.85	71.85	72.00	72.00
Amsterdam	149.90	150.10	150.10	150.10	150.40	150.25	150.30	150.00	149.70	149.70	149.85	150.00
1882												
London	18.20	18.26	18.22	18.18	18.21	18.18	18.17	18.17	18.18	18.15	18.15	18.13
Hamburg reichm.	89.25	89.20	89.10	89.00	89.10	89.00	89.00	88.90	89.00	88.95	89.15	89.25
Paris	72.30	72.25	72.00	72.05	72.25	72.20	72.25	72.10	72.00	71.75	71.80	71.85
Amsterdam	150.35	150.35	150.35	150.50	150.85	150.40	150.25	150.10	149.75	149.50	149.60	149.50
1883												
London	18.18	18.20	18.18	18.16	18.20	18.20	18.20	18.21	18.16	18.13	18.13	18.14
Hamburg reichm.	89.15	89.10	89.10	88.90	88.90	88.90	88.90	88.90	88.95	89.00	89.15	89.10
Paris	72.15	72.15	72.10	72.00	72.00	71.90	71.95	71.95	71.90	71.80	71.85	72.00
Amsterdam	150.30	150.30	150.70	150.70	150.70	149.90	149.80	149.80	149.90	149.75	149.75	150.00
1884												
London	18.18	18.24	18.19	18.16	18.16	18.16	18.14	18.14	18.14	18.13	18.22	18.23
Hamburg reichm.	89.10	89.10	89.00	88.90	88.90	88.90	88.90	88.90	89.00	89.00	89.10	89.15

Table A1. Exchange rates monthly 1819 - 1914

End-of-month quotations at Oslo Stock Exchange, Norwegian speciedaler in Copenhagen

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Paris	72.20	72.25	72.15	72.05	72.05	72.05	72.05	72.05	72.05	71.90	72.00	72.05
Amsterdam	150.10	150.20	150.25	150.60	150.20	149.75	149.85	149.75	149.80	149.60	150.00	150.10
1885												
London	18.24	18.27	18.27	18.24	18.18	18.13	18.15	18.17	18.16	18.15	18.15	18.17
Hamburg reichm.	89.15	89.15	89.15	89.15	89.15	89.10	89.15	89.20	89.20	89.25	89.25	89.25
Paris	72.10	72.15	72.05	71.85	71.95	71.95	71.95	72.00	71.85	71.90	71.95	71.95
Amsterdam	150.30	151.00	151.00	150.60	150.60	150.50	150.60	150.40	150.25	150.50	150.60	150.60
1886												
London	18.21	18.17	18.16	18.15	18.15	18.09	18.10	18.13	18.14	18.12	18.15	18.13
Hamburg reichm.	89.25	89.10	89.05	89.00	88.90	88.85	88.90	88.90	89.00	89.00	89.05	89.05
Paris	72.10	72.15	72.20	72.20	71.85	71.60	71.70	71.75	71.70	71.60	71.60	71.55
Amsterdam	150.70	150.80	150.90	150.60	150.40	149.80	149.80	150.00	149.70	149.70	149.70	149.85
1887												
London	18.16	18.16	18.14	18.12	18.13	18.12	18.12	18.17	18.19	18.14	18.13	18.13
Hamburg reichm.	89.05	89.05	89.05	89.05	89.05	89.05	89.05	89.05	89.05	89.05	89.05	89.05
Paris	71.60	71.60	71.50	71.70	71.80	71.80	71.80	71.75	71.60	71.50	71.55	71.50
Amsterdam	149.85	149.85	149.90	150.10	150.30	150.10	150.10	150.00	150.00	150.00	150.00	150.00
1888												
London	18.12	18.14	18.13	18.13	18.13	18.11	18.15	18.19	18.19	18.17	18.17	18.18
Hamburg reichm.	89.10	89.10	89.10	89.00	89.00	88.95	88.95	88.95	88.95	89.10	89.15	89.15
Paris	71.55	71.80	71.65	71.65	71.60	71.80	71.75	71.70	71.60	71.65	71.70	71.70
Amsterdam	150.35	150.50	150.40	150.50	150.20	150.20	150.40	150.50	150.20	150.20	150.30	150.40
1889												
London	18.18	18.20	18.18	18.16	18.15	18.14	18.15	18.19	18.21	18.15	18.15	18.15
Hamburg reichm.	89.15	89.05	88.95	88.90	88.90	88.85	88.90	88.95	88.95	89.05	89.15	89.20
Paris	71.85	71.90	71.90	71.90	72.00	72.10	72.15	72.00	72.05	71.90	71.85	72.00
Amsterdam	150.40	150.50	150.60	150.60	150.65	150.40	150.40	150.40	150.20	150.00	150.00	150.20
1890												
London	18.23	18.22	18.15	18.15	18.13	18.14	18.19	18.17	18.19	18.17	18.22	18.18
Hamburg reichm.	89.15	89.05	89.15	89.15	89.15	89.20	89.10	89.10	89.20	89.30	89.35	89.40
Paris	72.15	72.10	71.95	72.05	72.10	72.00	72.05	71.90	71.90	71.85	71.80	72.00
Amsterdam	150.60	150.50	150.40	150.50	150.50	150.35	150.50	150.40	150.40	150.30	150.30	150.80
1891												
London	18.15	18.17	18.16	18.17	18.20	18.12	18.13	18.13	18.14	18.16	18.18	18.14
Hamburg reichm.	89.35	89.20	89.20	89.00	88.95	89.00	89.20	89.20	89.30	89.25	89.35	89.30
Paris	71.95	72.00	72.00	71.90	71.85	71.70	71.75	71.65	71.70	71.80	71.95	72.05
Amsterdam	151.10	150.90	150.70	150.40	150.25	150.10	150.30	150.20	150.20	150.20	150.50	150.40
1892												
London	18.16	18.18	18.17	18.15	18.14	18.11	18.14	18.14	18.12	18.12	18.12	18.12
Hamburg reichm.	89.10	89.10	89.00	88.95	88.95	88.95	88.95	88.95	89.00	89.00	89.00	89.10
Paris	72.10	72.05	72.10	72.15	72.00	71.90	72.10	72.00	71.95	72.00	72.05	72.10
Amsterdam	150.50	150.30	150.30	150.20	150.20	150.00	150.00	150.00	149.80	150.10	150.20	150.30
1893												
London	18.15	18.17	18.16	18.14	18.21	18.13	18.15	18.23	18.14	18.13	18.13	18.14
Hamburg reichm.	89.10	89.00	88.90	88.85	88.85	88.95	89.05	89.15	89.20	89.20	89.20	89.20
Paris	72.25	72.20	72.20	72.15	71.95	71.95	71.95	71.85	71.85	71.95	71.95	72.00
Amsterdam	150.60	150.85	150.35	150.00	150.00	149.80	149.60	150.00	150.50	150.80	150.60	150.75
1894												
London	18.20	18.19	18.14	18.14	18.14	18.11	18.12	18.11	18.10	18.10	18.12	18.12
Hamburg reichm.	89.10	89.00	88.95	88.90	88.90	88.90	88.90	88.90	89.00	88.95	88.95	88.90

Table A1. Exchange rates monthly 1819 - 1914

End-of-month quotations at Oslo Stock Exchange, Norwegian speciedaler in Copenhagen

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Paris	72.20	72.20	72.00	71.95	71.95	71.95	71.95	71.85	71.85	72.00	72.10	72.05
Amsterdam	151.00	150.90	150.70	150.40	150.10	150.10	150.10	149.80	149.85	150.00	150.10	150.00
1895												
London	18.15	18.20	18.17	18.18	18.18	18.12	18.17	18.16	18.14	18.16	18.19	18.15
Hamburg reichm.	88.90	88.90	88.90	88.90	88.90	88.85	88.90	88.90	88.95	88.90	88.90	88.90
Paris	72.10	72.10	71.95	71.95	72.05	71.95	71.95	71.90	71.85	72.00	72.10	71.95
Amsterdam	150.20	150.75	150.10	150.10	150.10	149.80	150.00	150.00	149.90	149.90	149.90	149.70
1896												
London	18.20	18.21	18.17	18.16	18.14	18.12	18.13	18.15	18.13	18.15	18.16	18.17
Hamburg reichm.	89.05	89.05	88.90	88.90	88.95	88.95	88.95	89.00	89.05	89.15	89.20	89.25
Paris	72.15	72.20	72.05	72.15	72.15	72.05	72.10	72.10	72.05	72.05	72.05	72.05
Amsterdam	149.80	150.00	149.90	150.20	150.00	149.80	150.00	150.00	149.80	150.00	150.30	150.20
1897												
London	18.18	18.20	18.14	18.13	18.13	18.11	18.11	18.13	18.14	18.12	18.12	18.15
Hamburg reichm.	89.20	89.10	89.05	89.00	89.00	89.00	89.00	89.00	89.05	89.10	89.10	89.10
Paris	72.15	72.25	72.10	72.15	72.25	72.10	72.15	72.10	72.00	72.00	72.00	71.95
Amsterdam	150.40	150.50	149.90	150.00	150.30	150.00	150.00	150.00	150.00	150.20	150.30	150.20
1898												
London	18.17	18.19	18.21	18.24	18.22	18.14	18.16	18.16	18.18	18.27	18.21	18.24
Hamburg reichm.	89.10	89.00	88.90	88.95	89.05	89.05	89.10	89.05	89.15	89.25	89.20	89.25
Paris	72.10	72.05	72.00	72.10	72.05	71.85	72.00	71.95	71.90	72.05	72.05	72.25
Antwerp							71.90	71.80	71.70	71.90	71.80	72.05
Amsterdam	150.70	150.80	150.50	150.80	150.80	150.55	150.80	150.60	150.40	150.70	150.50	150.50
1899												
London	18.24	18.24	18.22	18.22	18.20	18.18	18.24	18.21	18.21	18.24	18.22	18.31
Hamburg reichm.	89.30	89.30	89.30	89.20	89.05	89.00	89.05	89.05	89.10	89.20	89.20	89.15
Paris	72.40	72.40	72.30	72.25	72.25	72.20	72.30	72.15	72.15	72.20	72.20	72.15
Antwerp	72.30	72.30	72.15	72.05	72.10	72.05	72.15	72.00	71.90	72.00	72.10	72.15
Amsterdam	150.70	150.60	150.30	150.10	150.10	149.70	150.30	150.30	150.20	151.20	151.20	151.10
1900												
London	18.28	18.26	18.23	18.28	18.22	18.19	18.25	18.24	18.20	18.22	18.19	18.18
Hamburg reichm.	89.20	89.15	89.15	89.15	89.10	89.10	89.10	89.10	89.10	89.10	89.00	89.10
Paris	72.60	72.50	72.40	72.60	72.45	72.45	72.60	72.45	72.50	72.55	72.45	72.45
Antwerp	72.45	72.40	72.30	72.40	72.30	72.30	72.45	72.50	72.35	72.40	72.30	72.35
Amsterdam	151.50	150.90	150.40	150.70	150.50	150.45	150.70	150.50	150.45	150.85	150.70	150.70
1901												
London	18.24	18.22	18.16	18.16	18.17	18.12	18.15	18.15	18.14	18.14	18.17	18.14
Hamburg reichm.	89.05	89.00	88.95	88.90	88.85	88.90	88.90	88.90	89.00	88.95	88.95	89.00
Paris	72.55	72.25	72.10	72.15	72.20	71.90	72.10	72.05	71.90	72.30	72.20	72.15
Antwerp	72.40	72.20	72.00	72.05	72.05	71.85	72.05	72.00	71.85	72.15	72.10	72.05
Amsterdam	150.90	151.00	150.00	150.20	150.50	150.20	150.00	149.90	149.60	150.00	150.10	149.80
1902												
London	18.17	18.22	18.18	18.21	18.22	18.19	18.20	18.20	18.19	18.17	18.19	18.18
Hamburg reichm.	88.95	89.00	88.95	88.95	88.95	88.90	88.90	88.85	88.90	88.85	88.90	89.00
Paris	72.20	72.40	72.25	72.30	72.25	72.25	72.35	72.30	72.25	72.35	72.35	72.30
Antwerp	72.15	72.30	72.15	72.20	72.20	72.10	72.20	72.20	72.10	72.20	72.20	72.25
Amsterdam	149.80	150.10	149.90	150.00	150.00	149.80	149.95	150.05	149.95	150.00	149.90	149.90
1903												
London	18.25	18.26	18.24	18.24	18.20	18.15	18.16	18.14	18.18	18.18	18.21	18.19
Hamburg reichm.	89.05	89.05	89.00	89.00	89.05	89.05	89.10	89.05	89.20	89.10	89.05	89.05

Table A1. Exchange rates monthly 1819 - 1914

End-of-month quotations at Oslo Stock Exchange, Norwegian speciedaler in Copenhagen

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Paris	72.60	72.55	72.50	72.50	72.30	72.25	72.25	72.10	72.15	72.40	72.30	72.30
Antwerp	72.45	72.40	72.40	72.30	72.15	72.10	72.10	72.00	72.00	72.25	72.15	72.20
Amsterdam	150.20	150.20	150.25	150.35	150.10	150.10	150.45	150.35	150.40	150.90	150.95	150.95
1904												
London	18.24	18.24	18.20	18.17	18.16	18.17	18.18	18.19	18.16	18.14	18.13	18.13
Hamburg reichm.	89.05	89.05	89.05	89.00	89.05	89.10	88.90	88.95	89.05	89.20	89.10	89.00
Paris	72.50	72.50	72.40	72.40	72.30	72.05	72.05	72.05	72.10	72.25	72.15	72.15
Antwerp	72.30	72.35	72.15	72.25	72.15	72.05	72.05	72.10	72.05	72.10	72.05	72.00
Amsterdam	151.05	151.00	150.55	150.70	150.35	150.20	150.35	150.20	150.30	150.45	150.70	150.50
1905												
London	18.18	18.21	18.18	18.18	18.19	18.17	18.18	18.17	18.15	18.19	18.17	18.17
Hamburg reichm.	88.95	88.85	88.80	88.80	88.80	88.80	88.85	88.85	88.85	88.95	89.05	89.05
Paris	72.35	72.20	72.25	72.30	72.20	72.30	72.35	72.20	72.15	72.00	72.30	72.40
Antwerp	72.15	72.15	72.15	72.20	72.10	72.10	72.20	72.15	72.00	72.05	72.05	72.25
Amsterdam	150.60	150.65	150.85	150.55	150.40	150.50	150.60	150.50	149.95	149.90	149.90	150.15
1906												
London	18.22	18.22	18.21	18.21	18.22	18.20	18.22	18.20	18.21	18.27	18.27	18.27
Hamburg reichm.	88.90	88.85	88.90	88.90	88.85	88.85	88.95	88.95	89.05	89.05	89.10	89.20
Paris	72.50	72.45	72.50	72.45	72.35	72.35	72.40	72.35	72.30	72.35	72.40	72.35
Antwerp	72.35	72.30	72.50	72.20	72.15	72.10	72.15	72.20	72.10	72.15	72.15	72.15
Amsterdam	150.30	150.00	149.85	149.90	149.95	150.10	150.40	150.50	150.45	150.55	150.70	150.70
1907												
London	18.28	18.28	18.30	18.24	18.23	18.21	18.22	18.26	18.25	18.32	18.35	18.37
Hamburg reichm.	89.15	89.10	89.20	89.15	89.10	89.05	89.10	89.10	89.25	89.25	89.40	89.50
Paris	72.50	72.35	72.35	72.45	72.55	72.45	72.45	72.60	72.55	72.85	72.85	72.90
Antwerp	72.20	72.20	72.25	72.25	72.25	72.25	72.25	72.30	72.35	72.65	72.70	72.75
Amsterdam	151.00	150.65	150.85	151.00	151.05	151.05	151.10	151.00	151.30	152.00	151.50	151.50
1908												
London	18.28	18.27	18.23	18.23	18.21	18.17	18.15	18.14	18.14	18.17	18.19	18.20
Hamburg reichm.	89.25	89.20	89.30	89.20	89.20	89.15	89.00	88.95	88.95	88.90	88.85	88.95
Paris	72.65	72.50	72.50	72.60	72.45	72.35	72.25	72.20	72.20	72.40	72.50	72.50
Antwerp	72.60	72.45	72.35	72.30	72.30	72.15	72.10	72.05	72.00	72.10	72.20	72.25
Amsterdam	151.55	151.00	150.60	150.60	150.40	150.30	150.25	150.40	150.40	150.65	150.85	150.90
1909												
London	18.25	18.24	18.23	18.20	18.17	18.18	18.20	18.17	18.16	18.25	18.23	18.21
Hamburg reichm.	88.95	88.95	89.10	88.95	88.90	88.95	89.05	88.95	89.00	89.15	89.10	89.10
Paris	72.50	72.35	72.35	72.35	72.20	72.20	72.25	72.20	72.25	72.35	72.40	72.35
Antwerp	72.25	72.20	72.15	72.15	72.00	72.00	72.05	72.00	72.00	72.15	72.10	72.00
Amsterdam	151.00	150.65	150.65	150.80	150.40	150.65	150.50	150.25	150.20	150.30	150.20	150.20
1910												
London	18.22	18.21	18.22	18.25	18.25	18.18	18.18	18.19	18.18	18.20	18.21	18.18
Hamburg reichm.	89.05	89.05	89.05	89.00	89.00	88.95	88.95	88.95	88.95	88.90	88.95	88.95
Paris	72.35	72.40	72.30	72.25	72.25	72.20	72.15	72.10	72.05	72.05	72.00	71.95
Antwerp	72.05	72.05	72.00	72.00	72.00	71.95	71.90	71.80	71.75	71.75	71.80	71.80
Amsterdam	150.15	150.10	150.05	150.90	150.70	150.75	150.75	150.75	150.50	150.60	150.70	150.65
1911												
London	18.22	18.22	18.18	18.19	18.17	18.17	18.19	18.19	18.24	18.22	18.19	18.21
Hamburg reichm.	89.00	89.05	88.95	88.95	88.90	88.90	88.90	88.85	89.05	88.95	88.95	89.00
Paris	72.05	72.10	71.95	71.95	71.85	71.80	72.05	72.05	72.55	72.45	72.20	72.25
Antwerp	71.90	71.95	71.75	71.75	71.65	71.45	71.80	71.70	72.00	71.95	71.90	71.85

Table A1. Exchange rates monthly 1819 - 1914

End-of-month quotations at Oslo Stock Exchange, Norwegian speciedaler in Copenhagen

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Amsterdam	150.85	150.85	150.55	150.70	150.45	150.40	150.70	150.40	150.55	150.60	150.80	150.85
1912												
London	18.24	18.23	18.23	18.22	18.21	18.21	18.21	18.21	18.20	18.26	18.22	18.21
Hamburg reichm.	88.95	89.05	89.15	89.00	89.00	89.00	88.95	88.95	89.00	88.95	89.00	89.15
Paris	72.30	72.20	72.25	72.20	72.15	72.20	72.15	72.00	72.00	72.40	72.45	72.35
Antwerp	72.00	71.95	71.80	71.80	71.80	71.75	71.90	71.85	71.85	72.10	71.85	71.85
Amsterdam	151.00	150.85	150.85	150.95	150.85	150.90	150.90	150.70	150.70	151.00	150.75	150.85
1913												
London	18.26	18.28	18.28	18.27	18.23	18.24	18.25	18.22	18.21	18.26	18.24	18.22
Hamburg reichm.	89.15	89.25	89.35	89.25	89.20	89.20	89.15	89.15	89.20	89.10	89.00	88.95
Paris	72.45	72.35	72.35	72.45	72.35	72.30	72.30	72.20	72.15	72.20	72.10	72.05
Antwerp	72.00	71.95	71.90	72.05	71.90	71.75	71.90	71.80	71.70	71.75	71.70	71.60
Amsterdam	150.90	150.65	150.55	150.70	150.25	150.30	150.30	150.20	150.45	150.65	150.55	150.50
1914												
London	18.20	18.19	18.19	18.23	18.26	18.25	18.30	18.40	18.75	18.95	19.10	19.33
Hamburg reichm.	88.95	89.00	89.00	89.00	89.05	89.00	89.05	89.25	89.20	86.25	85.00	87.75
Paris	72.25	72.15	72.30	72.45	72.50	72.50	72.80	73.00	74.50	75.50	77.00	77.50
Antwerp	71.80	71.80	71.90	72.05	72.05	72.00	72.30	72.50	74.00	74.00	74.75	75.00
Amsterdam	150.70	150.75	150.55	150.75	150.45	150.60	150.70	151.50	156.00	159.50	161.00	162.00

Table A2. Exchange rates monthly 1914 - 1940

Monthly averages of daily quotations at Oslo Stock Exchange

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1914												
GBP	18.22	18.18	18.19	18.20	18.24	18.25	18.25	18.35	18.62	18.87	19.00	19.32
USD									3.86	3.86	3.93	4.00
DEM	88.92	88.94	88.99	88.97	89.03	89.02	89.02	89.18	89.28	87.79	85.04	87.51
FRF	72.21	72.21	72.17	72.34	72.49	72.49	72.54	72.99	74.08	75.05	76.14	77.61
NLG	150.75	150.75	150.59	150.63	150.65	150.52	150.63	151.20	154.61	159.88	159.58	162.00
1915												
GBP	19.34	19.49	19.49	18.67	18.43	18.17	18.39	18.29	18.14	17.94	17.39	17.25
USD	4.020	4.060	4.070	3.930	3.900	3.860	3.910	3.920	3.920	3.860	3.780	3.690
SEK										100.16	100.38	102.48
DEM	87.57	86.20	83.81	80.72	79.48	77.97	78.82	79.08	79.53	78.60	75.67	70.96
FRF	77.31	77.73	77.25	73.62	72.31	70.15	69.22	67.14	66.17	65.76	63.44	62.88
NLG	161.19	163.17	161.79	155.21	153.19	152.17	155.59	156.41	157.72	158.17	157.68	157.27
1916												
GBP	17.48	17.05	16.68	16.05	15.63	16.23	16.74	16.77	17.22	17.18	17.24	17.12
USD	3.720	3.600	3.530	3.390	3.300	3.430	3.530	3.560	3.650	3.640	3.650	3.640
SEK	101.60	101.50	100.33	100.02	99.97	100.09	100.61	100.75	102.32	102.30	102.67	104.46
DEM	68.40	65.87	62.61	62.18	61.87	62.68	63.73	63.23	63.93	63.44	62.30	59.80
FRF	63.16	60.90	59.14	56.26	55.46	57.67	59.53	59.71	61.74	62.06	62.21	61.72
DKK		100.50	100.19	100.01	99.94	100.84	100.05	99.32	99.18	99.39	97.00	97.83
NLG	164.85	152.71	149.31	144.04	136.09	141.83	146.04	145.84	148.15	148.03	148.27	147.07
1917												
GBP	17.06	17.01	16.32	16.77	16.23	16.19	16.05	15.58	15.41	14.69	13.70	14.47
USD	3.620	3.590	3.440	3.410	3.420	3.410	3.380	3.290	3.250	3.100	2.900	3.060
SEK	105.32	106.00	102.87	102.50	102.50	102.85	106.13	108.67	108.96	115.41	115.74	105.00
DEM	60.46	59.80	55.32	53.21	52.45	48.39	48.11	46.51	45.34	43.35	43.22	56.24
FRF	61.46	61.26	58.84	59.41	59.75	59.35	58.73	56.81	56.02	53.52	50.51	53.37
DKK	99.56	100.00	100.00	100.00	100.00	100.00	99.15	99.79	99.86	99.96	99.56	97.66
NLG	146.29	145.23	139.18	139.23	140.12	140.42	139.43	137.43	136.62	133.94	126.60	132.19
CHF								73.87	69.42	68.17	66.60	71.27
1918												
GBP	14.67	15.04	15.24	15.04	15.14	15.08	15.07	15.09	15.42	16.98	17.30	16.97
USD	3.130	3.170	3.210	3.170	3.190	3.170	3.170	3.170	3.240	3.570	3.640	3.570
SEK	103.77	104.14	104.77	107.07	108.18	109.84	112.69	112.73	108.58	106.35	102.75	103.79
DEM	60.54	60.89	62.39	62.44	62.55	60.06	55.05	52.61	50.13	55.08	50.00	43.27
FRF	54.12	55.47	56.05	55.41	55.86	55.60	55.55	56.27	59.30	65.30	66.67	65.57
DKK	96.12	97.05	98.52	99.11	99.58	98.92	98.31	99.49	98.11	98.30	97.40	96.03
NLG	134.27	140.22	147.08	149.90	157.31	161.39	164.04	164.26	157.16	154.64	152.80	152.03
CHF	70.89	71.04	73.80	74.97	78.01	80.64	80.32	77.98	73.62	74.12	73.66	73.64
BEF												64.47
1919												
GBP	17.08	17.40	17.74	18.05	18.40	18.36	18.50	18.38	18.09	18.26	18.45	18.69
USD	3.590	3.660	3.770	3.890	3.950	3.970	4.170	4.300	4.330	4.360	4.500	4.880
SEK	103.25	102.86	104.27	103.89	101.94	102.34	103.93	105.90	106.02	105.98	103.62	104.84
DEM	44.29	40.72	37.01	31.96	31.72	28.85	27.91	22.40	18.08	16.42	11.89	10.36
FRF	65.74	67.03	66.63	64.77	62.68	62.18	60.24	55.30	51.18	51.06	48.11	45.95
DKK	95.28	95.33	96.94	97.38	95.38	94.50	94.68	93.77	95.01	94.10	93.66	91.35
NLG	151.03	150.99	153.31	156.67	156.56	156.26	158.39	160.25	161.93	165.46	169.63	185.56
CHF	74.16	75.13	77.11	78.79	78.74	74.95	74.84	76.30	77.48	78.15	81.81	91.07
BEF	64.14	65.33	64.67	62.02	61.66	60.57	58.76	53.65	50.93	51.60	51.93	48.07

Table A2. Exchange rates monthly 1914 - 1940

Monthly averages of daily quotations at Oslo Stock Exchange

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
FIM	40.26	39.88	38.31	40.38	40.10	35.96	31.63	28.89	24.83	19.97	17.29	15.95
Index	82.01	80.92	80.04	79.06	78.79	79.12	78.27	78.92	79.41	79.26	78.81	77.87
1920												
GBP	19.21	19.30	20.61	19.81	20.80	22.60	23.42	24.27	25.21	25.21	25.73	23.76
USD	5.210	5.770	5.620	5.050	5.430	5.750	6.050	6.730	7.180	7.260	7.490	6.810
SEK	108.00	107.58	113.06	110.34	114.51	124.86	132.26	137.87	144.97	143.01	143.02	133.28
DEM	8.780	6.110	7.080	8.710	11.990	14.950	15.490	14.230	13.050	10.760	9.960	9.450
FRF	44.86	41.17	40.45	31.20	37.27	45.40	49.50	48.20	48.50	47.56	45.24	40.57
DKK	92.03	86.45	94.64	90.40	90.55	96.51	99.19	100.09	100.21	101.13	100.42	100.81
NLG	197.81	215.38	206.02	187.15	197.76	207.32	212.23	220.91	224.82	224.61	226.60	211.40
CHF	93.82	95.69	95.64	90.69	96.17	104.54	107.29	111.74	116.74	115.81	116.64	105.47
BEF	45.19	42.63	42.31	33.77	39.24	47.98	52.90	51.77	51.64	50.47	48.03	42.88
ITL	38.48	33.10	31.04	23.11	28.35	34.58	35.77	33.35	31.63	28.90	27.55	24.21
ESP	99.26	101.21	99.50	88.07	91.41	95.17	97.29	101.48	106.07	104.74	98.12	89.06
FIM	19.90	24.26	29.79	28.00	28.27	27.12	24.75	22.17	22.83	19.10	16.45	16.78
Index	75.53	74.50	73.34	78.65	74.37	67.78	64.46	62.32	60.15	60.21	59.93	64.92
1921												
GBP	21.38	21.80	24.20	24.70	25.31	25.92	27.06	28.01	29.00	30.73	28.12	27.34
USD	5.750	5.630	6.200	6.300	6.390	6.860	7.470	7.680	7.800	7.980	7.090	6.600
SEK	122.18	125.13	140.68	147.95	148.18	153.84	157.63	162.08	169.77	183.26	164.51	161.67
DEM	8.960	9.250	9.920	10.010	10.340	10.020	9.460	9.210	7.620	5.690	2.930	3.720
FRF	36.80	40.51	43.87	45.57	53.44	55.45	58.56	59.64	57.08	55.51	51.20	51.57
DKK	102.60	104.28	106.98	113.78	115.29	117.97	118.25	123.92	137.91	150.79	130.99	128.64
NLG	188.78	192.65	213.27	218.68	226.40	228.63	238.36	238.67	247.20	265.96	248.17	239.58
CHF	90.20	92.45	105.53	109.36	114.05	116.78	123.94	129.51	133.98	145.33	133.85	128.39
BEF	38.78	42.51	45.97	47.01	43.50	55.23	57.58	58.16	56.43	56.99	49.55	49.54
ITL	20.84	21.12	23.88	29.23	34.15	34.60	34.52	33.26	33.24	31.79	29.62	29.49
ESP	77.98	79.24	86.77	88.17	87.04	89.96	96.08	99.60	101.86	105.99	97.85	96.88
FIM	18.46	18.63	16.75	14.47	13.69	11.90	12.38	11.68	11.18	12.34	13.57	12.66
Index	72.45	70.41	64.18	62.34	60.15	58.07	55.45	54.10	52.56	50.17	55.37	57.09
1922												
GBP	26.99	26.25	24.83	23.78	24.12	26.14	26.68	25.99	26.43	24.86	24.39	24.37
USD	6.400	6.020	5.680	5.400	5.430	5.890	6.010	5.830	5.970	5.610	5.450	5.300
SEK	159.55	157.47	148.71	140.70	140.04	151.86	155.96	153.55	158.10	149.70	146.43	142.89
DEM	3.570	3.060	2.000	2.000	1.960	1.930	1.310	0.630	0.430	0.220	0.090	0.075
FRF	52.18	52.38	51.27	49.81	49.61	51.60	49.63	46.43	45.78	41.53	37.26	38.40
DKK	127.89	124.38	120.02	114.17	116.55	127.44	129.57	125.78	126.14	113.55	110.41	109.70
NLG	235.27	226.71	215.30	204.81	209.80	227.75	233.15	226.39	231.74	218.88	214.05	211.34
CHF	124.28	118.31	110.70	105.29	104.48	112.02	115.04	111.09	112.40	103.94	100.62	100.34
BEF	50.13	50.13	48.09	46.24	45.58	48.50	47.18	44.06	43.29	38.89	34.72	35.39
ITL	28.15	29.46	29.39	29.16	28.83	29.44	27.83	26.51	25.75	23.59	24.59	26.72
ESP	95.77	94.86	89.33	83.94	85.23	92.33	93.84	90.75	91.67	85.81	83.40	82.87
FIM	12.15	12.21	12.00	10.73	11.49	12.90	13.06	12.51	13.12	13.18	14.05	13.44
Index	57.67	59.32	62.31	65.38	64.80	59.99	59.11	60.80	60.14	64.31	66.24	66.79
1923												
GBP	24.94	25.28	25.88	26.13	28.01	27.77	28.32	28.05	28.27	29.19	29.95	29.24
USD	5.360	5.390	5.510	5.620	6.060	6.020	6.180	6.150	6.230	6.450	6.830	6.710
SEK	144.27	143.64	146.78	149.69	161.58	159.99	164.09	163.86	165.47	170.43	179.92	176.68
DEM	0.044	0.022	0.027	0.025	0.015	0.007	0.003					
FRF	36.03	33.19	34.65	37.59	40.41	38.12	36.56	34.88	36.46	38.59	37.82	35.54

Table A2. Exchange rates monthly 1914 - 1940

Monthly averages of daily quotations at Oslo Stock Exchange

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DKK	106.63	103.26	106.04	106.43	113.18	108.40	108.52	113.64	112.94	113.46	117.87	119.87
NLG	212.52	213.49	217.77	220.13	237.29	236.08	242.56	242.13	244.91	252.59	260.02	255.51
CHF	100.88	101.63	102.76	102.49	109.35	108.18	108.64	111.11	111.44	115.38	119.93	117.18
BEF	33.09	29.44	30.19	32.51	34.81	32.68	30.48	28.09	30.51	33.05	32.54	30.88
ITL	26.55	26.13	26.69	28.02	29.52	27.75	26.84	26.56	27.56	29.23	29.82	29.17
ESP	84.07	84.64	85.62	86.13	92.40	90.12	88.58	84.14	84.53	86.99	89.39	87.54
FIM	13.47	14.25	15.22	15.50	16.81	16.66	17.08	17.07	16.84	17.30	18.03	16.62
Index	66.60	67.06	65.41	64.20	59.80	60.93	60.33	60.93	59.90	57.90	56.20	57.43
1924												
GBP	30.27	32.26	31.77	31.61	31.50	32.01	32.42	32.44	32.30	31.50	31.37	31.17
USD	7.110	7.500	7.410	7.280	7.230	7.410	7.440	7.220	7.240	7.030	6.820	6.650
SEK	186.39	196.50	194.80	192.26	191.67	196.97	198.28	192.43	192.81	187.17	182.97	179.40
DEM											164.00	158.94
FRF	33.50	33.48	34.72	44.78	42.26	39.18	38.55	38.21	38.67	36.93	36.08	36.08
DKK	121.21	120.41	116.44	121.31	122.46	124.80	119.92	117.40	122.70	122.16	119.82	117.51
NLG	265.93	280.98	274.91	271.06	270.60	277.89	282.75	280.71	278.99	274.96	273.12	269.29
CHF	123.32	130.41	128.16	128.32	128.28	131.05	135.42	136.22	136.89	134.95	131.82	129.06
BEF	30.12	29.20	28.82	37.93	35.54	34.05	34.21	36.29	36.16	34.02	33.14	33.15
ITL	30.99	32.72	31.84	32.46	32.20	32.14	32.15	32.14	31.74	30.80	29.73	28.64
ESP	90.74	95.71	94.22	99.24	99.81	99.97	99.19	96.92	95.86	94.21	92.66	92.72
FIM	18.43	18.87	18.50	18.27	18.10	18.50	18.74	18.20	18.17	17.68	17.19	16.75
Index	55.77	53.24	54.20	52.65	53.17	52.52	52.16	52.62	52.65	54.14	55.08	55.87
1925												
GBP	31.30	31.29	30.99	29.78	28.96	28.67	27.12	26.06	23.56	24.02	23.86	23.88
USD	6.550	6.560	6.490	6.210	5.970	5.900	5.580	5.370	4.860	4.960	4.920	4.930
SEK	176.70	176.86	175.08	167.52	159.81	158.06	150.14	144.36	130.42	133.08	131.87	132.10
DEM	156.53	156.37	154.87	148.23	142.44	140.63	133.20	128.06	115.87	118.38	117.38	117.45
FRF	35.51	34.87	33.72	32.39	30.95	28.32	26.36	25.28	22.96	22.28	19.71	18.61
DKK	116.90	116.96	117.35	114.77	112.40	112.77	118.84	124.89	119.67	121.94	122.74	122.77
NLG	265.30	263.85	259.47	248.47	240.18	237.15	224.19	216.11	195.58	199.63	198.28	198.17
CHF	126.94	126.47	125.29	120.25	115.62	114.80	108.59	104.37	94.09	95.73	95.07	95.23
BEF	33.21	33.49	33.02	31.69	30.09	28.01	26.04	24.43	21.63	22.57	22.43	22.43
ITL	27.47	27.08	26.46	25.55	24.36	22.85	20.59	19.74	19.87	19.94	19.81	20.01
ESP	92.93	93.34	92.28	88.78	86.74	86.05	81.14	77.40	70.00	71.21	70.34	70.04
FIM	16.53	16.53	16.36	15.70	15.07	14.91	14.15	13.57	12.30	12.56	12.46	12.48
Index	56.28	56.31	56.95	59.36	61.62	62.69	66.23	68.70	76.30	73.85	74.58	75.30
1926												
GBP	23.88	23.55	22.77	22.51	22.49	22.08	22.20	22.20	22.20	20.86	19.40	19.25
USD	4.920	4.840	4.680	4.630	4.630	4.540	4.565	4.570	4.575	4.300	4.000	3.965
SEK	131.87	129.83	125.70	124.17	124.00	121.77	122.44	122.40	122.30	115.00	106.94	106.09
DEM	117.21	115.49	111.66	110.31	110.27	108.19	108.75	108.82	109.00	102.45	95.14	94.51
FRF	18.70	17.87	16.86	15.80	14.81	13.58	11.57	13.13	13.26	12.68	13.77	15.79
DKK	122.19	123.25	122.58	121.41	121.33	120.32	121.02	121.40	121.50	114.38	106.64	105.78
NLG	197.83	194.53	187.89	185.95	186.20	182.56	183.50	183.50	183.50	172.15	160.13	158.86
CHF	95.15	93.58	90.33	89.50	89.59	88.06	88.50	88.50	88.50	83.15	77.32	76.82
BEF	22.45	22.14	20.22	17.26	14.73	13.61	11.42	12.83	12.62	12.16		
BEF											55.86	55.29
ITL	20.00	19.66	18.93	18.68	18.01	16.75	15.60	15.27	16.89	17.72	17.01	17.72
ESP	69.69	68.41	66.10	66.24	67.38	71.46	72.04	70.11	69.79	65.00	60.70	60.53
FIM	12.42	12.26	11.84	11.68	11.68	11.45	11.50	11.53	11.55	10.85	10.09	10.01

Table A2. Exchange rates monthly 1914 - 1940

Monthly averages of daily quotations at Oslo Stock Exchange

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Index	75.10	76.75	79.38	80.79	82.11	84.19	84.88	83.78	83.68	89.82	95.71	94.94
1927												
GBP	19.02	18.84	18.66	18.77	18.80	18.77	18.80	18.75	18.48	18.49	18.41	18.34
USD	3.920	3.880	3.850	3.870	3.872	3.866	3.873	3.859	3.800	3.798	3.777	3.758
SEK	104.77	103.70	102.90	103.57	103.60	103.59	103.73	103.55	102.22	102.35	101.78	101.52
DEM	93.03	92.11	91.30	91.65	91.81	91.64	91.96	91.87	90.16	90.73	90.24	89.85
FRF	15.58	15.29	15.11	15.17	15.20	15.18	15.20	15.14	14.94	14.95	14.88	14.80
DKK	104.57	103.60	102.55	103.15	103.38	103.37	103.53	103.37	101.82	101.84	101.32	100.89
NLG	156.92	155.47	153.99	153.99	155.00	154.92	155.15	154.73	152.43	152.72	152.57	152.06
CHF	75.71	74.79	74.02	74.02	74.53	74.45	74.57	74.45	73.36	73.33	72.92	72.63
BEF	54.60	54.09	53.52	53.52	53.88	53.77	53.87	53.75	53.02	53.01	52.75	52.60
ITL	17.20	16.85	17.43	17.43	21.09	21.71	21.26	21.10	20.74	20.84	20.64	20.29
ESP	62.82	65.34	66.94	66.94	68.40	66.72	66.34	65.43	65.28	65.77	64.19	62.69
FIM	9.890	9.810	9.720	9.720	9.750	9.750	9.750	9.740	9.590	9.600	9.640	9.490
Index	96.03	96.83	97.70	96.81	96.67	96.86	96.65	96.94	98.47	98.25	98.77	99.14
1928												
GBP	18.33	18.32	18.30	18.25	18.22	18.22	18.20	18.19	18.19	18.19	18.19	18.19
USD	3.759	3.758	3.750	3.740	3.733	3.733	3.741	3.748	3.750	3.752	3.752	3.750
SEK	101.14	100.94	100.74	100.47	100.25	100.24	100.26	100.37	100.40	100.38	100.34	100.40
DEM	89.64	89.73	89.74	89.52	89.37	89.31	89.35	89.43	89.46	89.43	89.46	89.46
FRF	14.80	14.80	14.79	14.76	14.75	14.72	14.70	14.70	14.70	14.78	14.73	14.73
DKK	100.76	100.70	100.60	100.40	100.20	100.20	100.10	100.10	100.10	100.10	100.10	100.13
NLG	151.75	151.42	151.07	150.84	150.68	150.69	150.68	150.46	150.43	150.48	150.65	150.70
CHF	72.55	72.74	72.32	72.17	72.00	72.02	72.13	72.21	72.25	72.26	72.27	72.32
BEF	52.55	52.50	52.39	52.30	52.18	52.20	52.25	52.23	52.22	52.22	52.25	52.25
ITL	19.93	19.95	19.88	19.80	19.75	19.72	19.70	19.70	19.69	19.70	19.70	19.70
ESP	64.51	64.10	63.26	62.90	62.62	62.06	61.83	62.46	62.22	62.96	60.65	60.98
FIM	9.480	9.480	9.470	9.450	9.430	9.420	9.430	9.450	9.460	9.470	9.470	9.470
Index	99.24	99.30	99.23	99.46	99.83	99.89	99.91	99.91	99.86	99.86	99.84	99.87
1929												
GBP	18.19	18.19	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20	18.20
USD	3.752	3.751	3.751	3.751	3.753	3.755	3.754	3.755	3.756	3.740	3.734	3.730
SEK	100.37	100.32	100.26	100.25	100.34	100.55	100.66	100.65	100.65	100.43	100.38	100.62
DEM	89.26	89.09	89.08	89.01	89.24	89.60	89.52	89.53	89.53	89.36	89.37	89.38
FRF	14.73	14.71	14.70	14.70	14.70	14.72	14.75	14.76	14.75	14.75	14.75	14.75
DKK	100.12	100.06	100.03	100.04	100.05	100.05	100.05	100.05	100.08	100.06	100.10	100.12
NLG	150.57	150.30	150.31	150.64	150.93	150.86	150.76	150.54	150.63	150.61	150.74	150.60
CHF	72.27	72.21	72.20	72.25	72.33	72.33	72.26	72.30	72.42	72.40	72.45	72.59
BEF	52.25	52.21	52.20	52.20	52.20	52.20	52.20	52.26	52.30	52.29	52.30	52.30
ITL	19.70	19.70	19.70	19.70	19.70	19.70	19.70	19.70	19.70	19.67	19.64	19.60
ESP	61.53	58.94	57.05	56.06	54.02	53.56	54.75	55.42	55.65	54.84	52.79	52.03
FIM	9.460	9.460	9.450	9.450	9.450	9.450	9.460	9.460	9.460	9.440	9.410	9.410
Index	99.91	100.03	100.09	100.13	100.09	99.98	99.93	99.88	99.86	99.99	100.06	100.07
1930												
GBP	18.21	18.19	18.17	18.17	18.16	18.15	18.16	18.17	18.17	18.16	18.16	18.16
USD	3.741	3.743	3.738	3.736	3.739	3.738	3.734	3.731	3.738	3.739	3.741	3.740
SEK	100.49	100.46	100.44	100.49	100.37	100.39	100.43	100.38	100.48	100.43	100.41	100.41
DEM	89.42	89.43	89.26	89.25	89.28	89.22	89.20	89.20	89.15	89.09	89.21	89.27
FRF	14.75	14.71	14.67	14.69	14.70	14.72	14.75	14.73	14.73	14.72	14.73	14.75
DKK	100.14	100.22	100.10	100.08	100.05	100.05	100.07	100.10	100.10	100.10	100.10	100.09

Table A2. Exchange rates monthly 1914 - 1940

Monthly averages of daily quotations at Oslo Stock Exchange

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
NLG	150.62	150.24	149.99	150.25	150.46	150.35	150.31	150.42	150.64	150.78	150.63	150.70
CHF	72.48	72.30	72.37	72.46	72.43	72.46	72.61	72.62	72.64	72.67	72.62	72.62
BEF	52.26	52.23	52.20	52.23	52.25	52.25	52.27	52.27	52.24	52.25	52.25	52.32
ITL	19.64	19.65	19.65	19.65	19.65	19.65	19.65	19.60	19.62	19.62	19.62	19.65
ESP	49.81	48.24	46.54	47.00	46.13	44.55	43.74	41.50	40.91	39.28	42.90	41.14
FIM	9.420	9.440	9.430	9.430	9.440	9.440	9.440	9.420	9.440	9.440	9.440	9.440
Index	100.06	100.13	100.29	100.28	100.28	100.37	100.39	100.46	100.45	100.51	100.37	100.40
1931												
GBP	18.16	18.16	18.16	18.17	18.17	18.17	18.17	18.17	17.82	17.68	18.10	18.24
USD	3.745	3.740	3.740	3.740	3.736	3.735	3.743	3.745	3.856	4.540	4.845	5.433
SEK	100.24	100.17	100.20	100.18	100.19	100.18	100.20	100.17	100.31	105.52	101.89	101.76
DEM	89.08	88.98	89.14	89.13	89.00	88.77	88.77	88.94	91.48	106.74	115.94	129.40
FRF	14.72	14.70	14.70	14.66	14.66	14.69	14.74	14.74	15.24	18.09	19.16	21.50
DKK	100.06	100.06	100.05	100.05	100.05	100.05	100.05	100.05	99.96	100.05	101.63	101.38
NLG	150.68	150.22	150.33	150.20	150.18	150.42	150.83	151.03	155.70	185.13	196.19	219.85
CHF	72.54	72.25	72.07	72.10	72.12	72.54	72.79	73.09	75.51	90.14	94.98	106.69
BEF	52.30	52.25	52.23	52.13	52.05	52.10	52.30	52.31	54.00	64.33	68.03	76.43
ITL	19.65	19.65	19.65	19.65	19.61	19.60	19.62	19.65	20.23	23.91	25.28	28.08
ESP	39.66	38.77	40.66	39.84	38.04	36.83	35.71	33.59	35.37	41.79	42.60	46.42
FIM	9.450	9.450	9.440	9.440	9.440	9.440	9.440	9.450	9.750	10.250	9.570	8.820
Index	100.51	100.59	100.53	100.56	100.65	100.75	101.15	100.82	98.62	91.68	87.32	82.55
1932												
GBP	18.33	18.35	18.43	19.64	19.90	20.14	20.13	19.96	19.90	19.79	19.58	19.41
USD	5.365	5.345	5.140	5.250	5.425	5.540	5.675	5.755	5.741	5.825	5.981	5.950
SEK	103.15	103.26	101.70	100.42	101.72	103.62	103.53	102.79	102.41	102.37	104.53	106.41
DEM	127.87	127.20	122.66	125.13	129.58	131.51	135.09	137.36	136.88	138.89	142.87	142.10
FRF	21.22	21.12	20.30	20.75	21.49	21.86	22.34	22.61	22.56	22.95	23.55	23.32
DKK	101.50	101.53	102.11	107.83	108.95	110.20	109.14	106.82	103.44	103.08	102.37	101.03
NLG	216.66	215.94	207.75	212.90	220.41	224.29	229.27	232.06	231.09	234.93	241.26	239.65
CHF	105.40	104.63	100.11	102.14	106.35	108.38	110.93	112.43	111.17	112.88	115.87	115.03
BEF	75.18	74.81	71.78	73.73	76.53	77.50	79.14	80.27	79.98	81.38	83.63	82.72
ITL	27.48	27.88	26.90	27.18	28.13	28.43	29.11	29.60	29.61	30.00	30.75	30.60
ESP	45.71	42.60	39.77	40.59	44.40	45.97	46.21	46.88	46.94	48.17	49.51	48.99
FIM	8.130	8.490	8.620	9.170	9.270	9.350	8.760	8.700	8.700	8.700	8.700	8.700
Index	82.95	82.98	84.84	81.94	80.03	78.61	77.88	77.72	78.10	77.58	76.70	77.27
1933												
GBP	19.45	19.52	19.54	19.55	19.66	19.81	19.90	19.88	19.90	19.90	19.90	19.90
USD	5.805	5.734	5.703	5.480	5.030	4.830	4.340	4.450	4.300	4.290	3.910	3.920
SEK	106.23	104.50	103.66	103.07	101.64	102.21	102.95	102.86	103.00	102.99	102.85	102.85
DEM	138.58	136.53	135.71	134.07	137.94	138.68	142.92	145.05	152.01	152.35	148.98	146.14
FRF	22.74	22.50	22.48	22.54	23.19	23.17	23.50	23.84	24.92	25.01	24.43	23.98
DKK	88.79	87.44	87.34	87.56	88.07	88.60	89.19	89.10	89.25	89.25	89.25	89.25
NLG	233.79	230.65	230.07	230.70	236.41	236.28	241.51	245.24	256.22	257.48	251.38	245.85
CHF	112.46	111.26	110.75	110.67	113.88	113.79	116.11	117.89	123.35	124.00	121.12	118.71
BEF	80.87	80.16	79.87	79.96	82.33	82.33	83.87	85.13	88.93	89.12	87.09	85.17
ITL	29.90	29.48	29.38	29.57	30.79	30.83	31.83	32.09	33.53	33.70	32.99	32.27
ESP	47.95	47.53	48.44	48.99	50.66	50.48	50.32	51.22	53.44	53.59	51.56	50.30
FIM	8.700	8.700	8.700	8.710	8.750	8.810	8.850	8.890	8.900	8.900	8.900	8.900
Index	78.28	79.48	79.63	80.40	80.29	80.15	80.16	79.41	78.28	78.22	79.94	80.47
1934												

Table A2. Exchange rates monthly 1914 - 1940

Monthly averages of daily quotations at Oslo Stock Exchange

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GBP	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90
USD	3.965	3.988	3.945	3.890	3.924	3.965	3.969	3.947	4.007	4.050	4.008	4.045
SEK	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85
DEM	149.25	155.02	156.02	153.89	154.66	152.39	152.77	155.85	161.13	163.89	161.29	162.67
FRF	24.65	25.78	25.91	25.70	25.94	26.15	26.18	26.30	26.77	26.89	26.47	26.75
DKK	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25
NLG	252.50	263.33	264.68	263.42	265.99	268.52	268.54	269.56	274.49	275.77	270.89	273.41
CHF	121.78	126.69	127.34	126.32	127.69	129.07	129.34	130.17	132.56	133.18	130.53	131.39
BEF	87.86	91.33	91.80	91.10	91.95	92.80	92.67	93.80	93.35	95.40	93.87	95.10
ITL	33.04	34.44	33.98	33.43	33.51	34.21	34.15	34.30	34.90	35.07	34.39	34.62
ESP	51.84	53.30	53.90	53.50	54.09	54.42	54.50	54.75	55.67	55.90	55.03	55.52
FIM	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900
Index	79.59	78.31	78.25	78.69	78.37	78.45	78.32	77.91	76.93	76.55	77.13	76.77
1935												
GBP	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90
USD	4.090	4.104	4.190	4.140	4.090	4.055	4.035	4.025	4.057	4.075	4.063	4.058
SEK	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85
DEM	163.95	164.72	169.52	166.91	165.06	164.01	163.12	162.57	163.35	164.22	163.60	163.45
FRF	26.98	27.13	27.84	27.39	27.05	26.87	26.82	26.76	26.80	26.93	26.83	26.85
DKK	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25
NLG	275.81	277.17	284.91	279.36	276.89	275.18	274.62	272.92	273.99	276.10	275.30	275.03
CHF	132.54	133.16	136.80	134.47	132.74	132.77	132.61	132.08	132.18	132.97	132.15	131.91
BEF	95.91	96.25	97.01	70.97	70.07	69.41	68.93	68.66	69.06	69.29	69.16	68.84
ITL	35.03	34.96	35.17	34.51	33.89	33.62	33.37	33.30	33.30	33.35	33.30	33.30
ESP	56.11	56.31	57.83	56.89	56.22	55.79	55.75	55.63	55.68	55.88	55.68	55.77
FIM	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900
Index	76.43	76.24	75.45	77.03	77.48	77.76	77.98	78.04	77.89	77.70	77.83	77.87
1936												
GBP	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90
USD	4.035	4.002	4.024	4.047	4.026	3.986	3.983	3.980	3.973	4.085	4.090	4.073
SEK	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85
DEM	163.05	163.02	162.97	163.16	162.67	161.03	161.10	160.55	159.70	164.45	165.06	164.20
FRF	26.79	26.80	26.78	26.74	26.58	26.35	26.46	26.28	26.13	19.23	19.15	19.15
DKK	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25
NLG	274.94	274.69	270.59	274.73	272.33	269.69	271.17	270.19	266.80	219.70	221.29	222.57
CHF	132.04	132.55	132.55	132.32	130.87	129.76	130.86	130.27	127.95	94.51	94.64	94.15
BEF	68.74	68.69	68.76	68.93	68.62	67.84	67.72	67.54	67.47	69.13	69.64	69.26
ITL	33.30	33.30	33.30	33.30	32.52	31.91	31.75	31.72	31.52	22.00	22.00	22.00
ESP	55.70	55.60	55.60	55.50	55.24	54.62	54.49	51.27	44.19	39.09	36.75	36.75
FIM	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900
Index	78.02	78.10	78.06	78.00	78.22	78.64	78.60	78.72	79.17	80.42	80.37	80.62
1937												
GBP	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90
USD	4.073	4.084	4.092	4.068	4.047	4.050	4.025	4.012	4.036	4.034	4.002	4.001
SEK	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85	102.85
DEM	164.28	164.53	164.96	163.96	162.93	162.78	162.32	161.79	162.38	162.41	162.07	161.55
FRF	19.15	19.15	18.97	18.44	18.25	18.17	15.56	15.20	14.50	13.69	13.74	13.75
DKK	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25
NLG	223.36	223.71	224.21	223.12	222.64	223.12	222.14	221.64	222.97	223.40	222.34	222.87
CHF	93.91	93.70	93.73	93.22	93.03	93.15	92.72	92.65	93.38	93.51	93.17	93.00

Table A2. Exchange rates monthly 1914 - 1940

Monthly averages of daily quotations at Oslo Stock Exchange

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
BEF	69.04	69.25	69.49	68.98	68.75	68.77	68.23	68.01	68.42	68.50	68.61	68.45
ITL	22.00	22.00	22.00	21.82	21.60	21.60	21.54	21.50	21.50	21.50	21.37	21.40
ESP	34.97	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33	33.33
FIM	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900
Index	80.70	80.55	80.69	81.10	81.39	81.45	82.20	82.24	82.12	82.30	82.47	82.52
1938												
GBP	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90
USD	3.998	3.983	4.010	4.015	4.022	4.031	4.053	4.093	4.163	4.191	4.245	4.278
SEK	102.85	102.83	102.77	102.85	102.85	102.85	102.85	102.85	102.85	102.84	102.85	102.82
DEM	161.46	161.56	161.90	161.84	162.03	162.74	163.39	164.58	166.91	168.39	170.50	172.09
FRF	13.53	13.24	12.69	12.59	11.52	11.37	11.37	11.35	11.35	11.35	11.35	11.42
DKK	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25
NLG	223.10	223.25	223.17	223.35	223.14	223.52	223.62	224.03	224.89	228.39	231.11	232.97
CHF	93.00	93.00	92.92	92.70	92.33	92.76	93.29	94.13	94.48	95.76	96.66	97.36
BEF	68.08	68.02	68.17	68.16	68.25	68.93	69.17	69.57	70.79	71.41	72.35	72.65
ITL	21.40	21.35	21.39	21.39	21.37	21.45	21.50	21.69	22.07	22.30	22.57	22.77
ESP	24.33	24.33	24.33	22.22	20.60	18.98	18.98	18.98	18.98	18.98	18.98	18.98
FIM	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900	8.900
Index	82.63	82.76	82.82	82.84	83.06	82.95	82.80	82.47	82.01	81.67	81.17	80.82
1939												
GBP	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.82	17.85	17.71	17.35	17.35
USD	4.282	4.265	4.265	4.270	4.270	4.268	4.270	4.284	4.400	4.400	4.400	4.400
SEK	102.81	102.83	102.80	102.83	102.82	102.76	102.80	103.12	105.25	105.25	105.25	105.25
DEM	172.25	171.76	171.60	171.76	171.91	171.73	171.75	172.07	177.11	179.19	179.00	179.00
FRF	11.46	11.45	11.45	11.45	11.45	11.45	11.45	11.43	10.66	10.45	10.20	10.13
DKK	89.25	89.25	89.25	89.25	89.25	89.25	89.25	89.25	86.23	85.50	85.50	85.50
NLG	232.61	229.30	226.91	227.29	229.25	227.40	227.75	229.78	238.00	237.19	236.70	236.40
CHF	97.26	97.24	97.05	96.33	96.56	96.78	96.82	97.40	101.00	100.90	100.50	100.28
BEF	72.84	72.46	72.25	72.32	73.24	73.05	73.00	73.23	76.38	76.00	74.82	74.47
ITL	22.76	22.70	22.62	22.60	22.60	22.60	22.60	22.73	23.75	23.45	23.00	23.00
ESP	18.98	18.98										
FIM	8.900	8.900	8.900	8.900	8.900	8.900	8.800	8.940	9.250	9.130	9.160	9.200
Index	80.88	81.03	81.08	81.05	80.97	81.01	81.00					
1940												
GBP	17.50	17.51	17.23	17.75						17.75	17.75	17.75
USD	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400
SEK	105.25	105.21	105.25	105.25	105.25	105.25	105.25	105.25	105.25	105.25	105.21	105.10
DEM	179.00	179.00	179.00	176.75	177.00	177.14	177.50	177.50	177.29	176.75	176.75	176.75
FRF	10.19	10.22	9.86	9.20						9.52	9.95	9.50
DKK	85.50	85.41	85.40	85.40	85.40	85.40	85.40	85.40	85.40	85.40	85.40	85.40
NLG	236.76	236.60	236.50	236.50						235.00	235.00	235.00
CHF	100.25	100.25	100.25	100.25	99.75	99.82	100.65	101.25	101.25	102.60	103.00	103.00
BEF	75.42	75.66	76.15	76.61						71.50	71.50	71.50
ITL	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.01	23.10	23.10	23.10	23.10
FIM	9.200	9.200	9.200	9.200	9.200	9.200	9.200	9.200	9.200	9.200	9.200	9.200

Table A3. Selected exchange rates monthly 1941 - 2003

Monthly averages of daily quotations at Oslo Stock Exchange

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1941												
GBP	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75
USD	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400
SEK	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10
DEM	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75
FRF	9.250	9.000	9.020	9.630	9.960	10.130	10.200	10.200	10.200	10.040	10.000	10.000
1942												
GBP	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75
USD	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400
SEK	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10
DEM	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75
FRF	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
1943												
GBP	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75
USD	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400
SEK	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10
DEM	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75
FRF	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
1944												
GBP	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75	17.75
USD	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400	4.400
SEK	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10	105.10
DEM	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75	176.75
FRF	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
1945												
GBP	17.75	17.75	17.75	17.75	19.28	20.05	20.05	20.05	20.05	20.05	20.05	20.05
USD	4.400	4.400	4.400	4.400	4.780	4.970	4.970	4.970	4.970	4.970	4.970	4.970
SEK	105.10	105.10	105.10	105.10	114.10	118.60	118.60	118.60	118.60	118.60	118.60	118.60
DEM	176.75	176.75	176.75	176.75								
FRF	10.00	10.00	10.00	10.00						10.25	10.25	9.43
1946												
GBP	20.05	20.05	20.05	20.05	20.05	20.02	20.02	20.02	20.02	20.02	20.02	20.02
USD	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970
SEK	118.60	118.57	118.55	118.55	118.55	118.55	130.25	138.30	138.30	138.30	138.30	138.30
FRF	4.200	4.200	4.185	4.180	4.180	4.180	4.180	4.180	4.180	4.180	4.180	4.180
1947												
GBP	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02
USD	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970
SEK	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30
FRF	4.180	4.180	4.180	4.180	4.180	4.180	4.180	4.180	4.180	4.180	4.180	4.180
1948												
GBP	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02
USD	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970
SEK	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30
FRF	3.810	2.325	2.325	2.325	2.325	2.325	2.325	2.325	2.325	2.124	1.890	1.890
1949												
GBP	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02
USD	4.970	4.970	4.970	4.970	4.970	4.970	4.970	4.970	5.842	7.150	7.150	7.150
SEK	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30
DEM											170.60	170.60

Table A3. Selected exchange rates monthly 1941 - 2003

	Monthly averages of daily quotations at Oslo Stock Exchange											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
FRF	1.890	1.890	1.890	1.883	1.883	1.883	1.833	1.833	1.914	2.049	2.049	2.049
1950												
GBP	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02
USD	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150
SEK	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30
DEM	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60
FRF	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049
1951												
GBP	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02
USD	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150
SEK	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30
DEM	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60
FRF	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049
1952												
GBP	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02
USD	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150
SEK	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30
DEM	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60
FRF	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049
1953												
GBP	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02
USD	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150
SEK	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.30	138.31
DEM	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	170.60	171.08
FRF	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049	2.049
1954												
GBP	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02
USD	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150
SEK	138.22	138.01	137.82	137.59	137.69	138.13	137.95	137.99	138.16	137.87	137.61	137.85
DEM	171.43	171.19	171.02	170.67	170.47	170.59	170.92	170.95	170.78	170.47	170.28	170.38
FRF	2.047	2.044	2.040	2.036	2.034	2.040	2.042	2.042	2.051	2.047	2.044	2.047
1955												
GBP	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.01	20.01	20.01	20.01	20.02
USD	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150
SEK	138.06	138.04	137.65	137.70	137.95	138.51	138.99	139.19	139.07	138.76	138.10	137.98
DEM	170.52	170.30	169.89	170.00	170.49	171.04	171.44	171.28	171.27	170.85	170.59	170.72
FRF	2.054	2.056	2.051	2.043	2.048	2.051	2.058	2.059	2.056	2.042	2.041	2.041
1956												
GBP	20.02	20.02	20.02	20.02	20.02	20.02	20.01	20.00	19.99	20.00	19.96	19.95
USD	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150
SEK	137.83	137.90	137.87	137.75	137.77	138.28	138.80	138.98	138.87	138.39	138.65	138.15
DEM	170.81	170.92	170.95	170.77	170.84	171.38	171.48	171.32	171.18	171.03	170.83	170.46
FRF	2.037	2.040	2.038	2.036	2.036	2.043	2.044	2.042	2.040	2.039	2.037	2.032
1957												
GBP	19.99	20.01	20.00	20.01	20.00	19.99	20.00	19.99	19.96	19.99	20.01	20.02
USD	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150
SEK	138.02	138.09	138.20	138.06	138.36	138.47	138.48	138.60	138.24	138.14	138.17	138.33
DEM	170.42	170.43	170.38	170.35	170.48	170.78	171.36	171.38	170.97	170.18	170.15	170.34
FRF	2.031	2.032	2.035	2.031	2.032	2.036	2.042	1.836	1.743	1.694	1.696	1.704
1958												

Table A3. Selected exchange rates monthly 1941 - 2003

Monthly averages of daily quotations at Oslo Stock Exchange

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GBP	20.02	20.02	20.02	20.02	20.02	20.02	20.00	20.00	20.01	20.01	20.02	20.02
USD	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150
SEK	138.18	137.99	137.97	138.09	138.32	138.50	138.72	138.75	138.43	138.21	138.34	138.35
DEM	170.19	170.21	170.41	170.77	171.13	171.29	171.46	171.28	171.29	171.33	171.25	171.32
FRF	1.704	1.700	1.697	1.698	1.700	1.704	1.707	1.708	1.706	1.703	1.702	1.672
1959												
GBP	20.02	20.04	20.05	20.05	20.05	20.02	20.02	20.02	20.02	20.02	20.02	20.01
USD	7.140	7.140	7.130	7.130	7.130	7.120	7.120	7.130	7.140	7.140	7.150	7.150
SEK	138.07	138.13	138.06	137.88	137.93	137.86	137.90	137.98	138.26	138.13	138.15	138.28
DEM	170.99	171.01	170.83	170.59	170.67	170.72	170.66	170.65	171.00	171.07	171.55	171.75
FRF	1.458	1.458	1.458	1.456	1.457	1.456	1.455	1.457	1.460	1.457	1.459	1.461
1960												
GBP	20.02	20.03	20.03	20.02	20.02	20.01	20.03	20.04	20.04	20.04	20.04	20.03
USD	7.150	7.150	7.140	7.130	7.130	7.140	7.130	7.130	7.130	7.130	7.130	7.140
SEK	138.25	138.35	138.15	138.35	138.45	138.55	138.45	138.55	138.35	138.25	138.20	138.25
DEM	171.80	171.75	171.70	171.45	171.45	171.65	171.45	171.35	171.25	171.25	171.15	171.45
FRF	146.00	145.85	145.75	145.65	145.75	145.95	145.85	145.75	145.65	145.55	145.65	145.75
1961												
GBP	20.04	20.03	20.01	20.01	20.01	20.00	20.00	20.01	20.03	20.04	20.04	20.03
USD	7.140	7.150	7.150	7.150	7.160	7.170	7.170	7.150	7.130	7.120	7.120	7.130
SEK	138.45	138.55	138.65	138.55	138.95	139.00	139.25	138.75	137.00	138.05	138.05	138.10
DEM	171.55	171.70	176.25	180.45	180.65	180.00	180.75	179.55	179.00	178.55	178.25	178.75
FRF	145.95	146.10	146.25	146.15	146.35	146.55	146.65	145.65	145.25	145.00	145.15	145.45
1962												
GBP	20.04	20.05	20.05	20.06	20.05	20.03	20.04	20.03	20.05	20.03	20.03	20.03
USD	7.130	7.130	7.130	7.130	7.130	7.140	7.140	7.150	7.150	7.150	7.150	7.150
SEK	138.25	138.45	138.40	138.65	138.75	138.95	139.00	139.00	139.00	139.05	138.75	138.00
DEM	178.75	178.50	178.60	178.65	178.75	178.95	179.55	179.15	179.10	178.65	178.75	179.00
FRF	145.75	145.65	145.65	145.75	145.85	145.95	146.00	146.10	146.25	146.25	146.20	146.10
1963												
GBP	20.04	20.03	20.02	20.01	20.01	20.01	20.02	20.03	20.02	20.03	20.03	20.02
USD	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.160	7.160	7.160	7.160	7.160
SEK	138.10	138.20	138.00	137.85	137.95	138.10	138.15	138.00	138.25	138.15	138.25	138.10
DEM	178.75	178.85	179.00	179.35	179.55	179.85	179.85	179.95	180.15	180.25	180.35	180.55
FRF	146.05	146.10	146.15	146.05	146.15	146.10	146.10	146.20	146.35	146.35	146.35	146.35
1964												
GBP	20.03	20.03	20.03	20.02	20.01	20.00	19.98	19.97	19.95	19.95	19.96	19.97
USD	7.160	7.160	7.160	7.150	7.150	7.160	7.160	7.170	7.170	7.170	7.160	7.160
SEK	138.25	138.45	138.95	139.35	139.45	139.55	139.65	139.70	139.85	139.15	139.15	139.35
DEM	180.45	180.65	180.55	180.25	180.25	180.35	180.45	180.55	180.65	180.70	180.65	180.25
FRF	146.35	146.45	146.35	146.20	146.15	146.25	146.40	146.40	146.55	146.55	146.65	146.25
1965												
GBP	19.97	19.99	19.98	19.99	20.01	19.99	19.97	19.97	19.98	20.02	20.03	20.02
USD	7.160	7.160	7.160	7.160	7.160	7.160	7.160	7.160	7.150	7.150	7.150	7.150
SEK	139.55	139.55	139.55	139.60	139.55	139.00	138.75	138.55	138.55	138.35	138.45	138.40
DEM	180.25	180.35	180.35	180.15	179.95	179.35	179.15	178.70	178.85	179.00	179.00	179.00
FRF	146.25	146.25	146.25	146.25	146.20	146.35	146.35	146.25	146.15	146.05	146.05	146.10
1966												
GBP	20.03	20.04	20.00	20.00	20.00	19.98	19.97	19.95	19.95	19.95	19.95	19.95
USD	7.150	7.150	7.160	7.160	7.160	7.160	7.150	7.150	7.150	7.150	7.150	7.150

Table A3. Selected exchange rates monthly 1941 - 2003

Monthly averages of daily quotations at Oslo Stock Exchange

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
SEK	138.55	138.55	138.95	139.10	139.00	139.10	138.85	138.55	138.55	138.55	138.55	138.50
DEM	178.55	178.35	178.65	178.65	178.60	179.00	179.55	179.65	179.55	179.95	180.10	180.30
FRF	146.05	146.15	146.25	146.30	146.35	146.40	146.35	146.15	145.65	144.95	144.95	144.65
1967												
GBP	19.96	20.00	20.00	20.01	20.01	19.96	19.94	19.93	19.92	19.91	19.04	17.18
USD	7.160	7.160	7.160	7.150	7.150	7.150	7.160	7.160	7.160	7.160	7.160	7.150
SEK	138.65	138.85	138.85	138.95	139.00	139.10	139.15	138.95	138.95	138.65	138.45	138.60
DEM	180.25	180.40	180.45	180.35	180.00	180.00	179.55	179.15	179.05	179.15	179.95	179.95
FRF	144.75	144.85	144.75	144.95	145.85	145.95	146.15	146.10	146.15	146.20	146.20	146.05
1968												
GBP	17.21	17.23	17.16	17.18	17.08	17.05	17.08	17.11	17.06	17.08	17.05	17.05
USD	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150	7.150
SEK	138.65	138.75	138.45	138.40	138.55	138.55	138.55	138.65	138.65	138.55	138.35	138.35
DEM	178.85	178.85	179.55	179.65	179.85	179.55	178.55	178.15	179.00	180.00	180.05	179.55
FRF	145.45	145.45	145.50	145.30	144.85	144.00	143.95	143.95	144.00	143.95	144.00	144.65
1969												
GBP	17.08	17.11	17.11	17.08	17.06	17.06	17.08	17.08	17.06	17.09	17.14	17.13
USD	7.160	7.150	7.150	7.150	7.150	7.140	7.160	7.150	7.160	7.160	7.160	7.150
SEK	138.55	138.45	138.55	138.50	138.55	138.35	138.35	138.55	138.45	138.60	138.75	138.65
DEM	179.00	178.10	178.15	177.85	179.00	178.95	178.85	179.25	180.15	192.85	194.00	194.15
FRF	144.65	144.65	144.35	144.10	144.00	143.75	143.95	134.02	129.15	129.00	128.45	128.50
1970												
GBP	17.16	17.18	17.18	17.18	17.18	17.14	17.08	17.06	17.04	17.06	17.08	17.05
USD	7.149	7.146	7.141	7.141	7.148	7.146	7.144	7.142	7.144	7.145	7.143	7.131
SEK	138.42	138.03	137.37	137.39	137.52	137.70	137.79	137.94	137.39	137.81	138.06	137.94
DEM	193.98	193.76	194.35	196.07	196.75	196.75	196.75	196.71	196.76	196.73	196.77	195.70
FRF	128.76	128.90	128.84	129.11	129.48	129.48	129.49	129.38	129.44	129.39	129.46	129.14
1971												
GBP	17.17	17.26	17.26	17.23	17.21	17.20	17.18	17.08	17.04	17.06	17.10	17.05
USD	7.140	7.141	7.137	7.127	7.114	7.110	7.105	7.016	6.895	6.847	6.855	6.745
SEK	138.31	138.07	138.27	138.09	137.75	137.76	137.38	136.90	136.21	136.42	137.08	137.90
DEM	196.33	196.67	196.53	196.13	200.43	202.53	204.07	205.52	205.34	205.94	205.85	206.30
FRF	129.41	129.44	129.42	129.24	128.81	128.66	128.89	127.27	126.94	125.28	125.37	126.17
1972												
GBP	17.23	17.31	17.27	17.22	17.17	16.88	15.90	15.97	16.05	15.82	15.53	15.43
USD	6.704	6.651	6.595	6.600	6.571	6.537	6.508	6.526	6.578	6.609	6.611	6.588
SEK	138.97	138.76	138.21	138.00	138.24	137.97	137.58	137.96	138.97	139.16	139.19	138.73
DEM	207.40	208.69	207.99	207.66	206.67	206.12	205.93	204.67	205.85	205.90	206.11	205.79
FRF	129.63	130.80	132.19	133.18	132.65	132.83	133.79	133.41	133.18	132.48	131.02	129.44
1973												
GBP	15.57	15.10	14.63	14.69	14.72	14.19	13.41	13.64	13.39	13.28	13.41	13.11
USD	6.619	6.233	5.909	5.913	5.819	5.508	5.274	5.509	5.537	5.470	5.609	5.653
SEK	139.46	135.94	131.94	131.07	131.14	130.56	130.70	132.72	131.76	130.94	129.26	124.83
DEM	206.82	206.35	209.13	208.45	208.20	212.72	225.80	227.36	228.46	226.68	217.77	213.26
FRF	130.02	130.19	130.87	130.12	129.91	129.49	130.05	128.91	128.66	128.50	125.86	121.34
1974												
GBP	13.29	13.14	13.21	13.14	12.85	12.97	12.90	12.85	12.87	12.85	12.67	12.38
USD	5.966	5.773	5.647	5.493	5.322	5.429	5.401	5.477	5.555	5.508	5.438	5.315
SEK	124.42	123.34	123.59	124.94	124.59	124.26	123.41	123.90	124.09	125.32	126.03	126.70
DEM	212.34	212.73	215.40	217.80	216.57	215.13	211.64	209.45	208.88	212.35	216.37	216.61

Table A3. Selected exchange rates monthly 1941 - 2003

	Monthly averages of daily quotations at Oslo Stock Exchange											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
FRF	117.38	115.87	117.16	113.16	109.52	110.70	113.20	114.67	115.72	116.34	116.38	117.30
1975												
GBP	12.07	12.00	11.88	11.82	11.48	11.19	11.34	11.55	11.68	11.36	11.31	11.24
USD	5.108	5.013	4.910	4.988	4.946	4.902	5.189	5.464	5.599	5.526	5.515	5.559
SEK	126.50	125.93	125.30	125.55	125.81	125.22	125.93	126.62	126.13	125.80	125.79	126.12
DEM	216.01	215.12	212.24	210.07	210.63	209.52	210.51	212.21	214.09	214.03	213.31	211.98
FRF	117.00	117.06	116.98	118.84	122.26	122.44	122.97	124.88	125.29	125.33	125.27	124.71
1976												
GBP	11.269	11.193	10.798	10.155	9.969	9.827	9.979	9.816	9.402	8.721	8.626	8.749
USD	5.555	5.523	5.548	5.494	5.489	5.547	5.585	5.507	5.432	5.317	5.269	5.211
SEK	126.91	126.28	126.01	124.82	124.62	124.76	125.05	124.88	124.84	125.04	125.01	125.31
DEM	213.43	215.73	216.75	216.62	214.76	215.61	216.96	217.83	217.88	218.85	218.54	218.60
FRF	124.15	123.56	120.08	117.63	116.90	117.14	115.50	110.94	110.57	106.84	105.63	104.52
1977												
GBP	9.030	9.044	9.018	9.083	9.062	9.088	9.054	9.224	9.565	9.710	9.926	9.733
USD	5.271	5.288	5.252	5.283	5.273	5.286	5.258	5.301	5.485	5.486	5.453	5.247
SEK	125.22	124.55	124.64	121.73	121.19	119.69	120.90	119.13	113.02	114.37	113.76	110.47
DEM	220.55	219.93	219.61	222.76	223.64	224.53	230.28	229.02	236.05	240.85	243.29	243.65
FRF	106.09	106.24	105.43	106.43	106.48	107.01	108.41	108.30	111.46	112.94	112.41	109.48
1978												
GBP	9.962	10.219	10.171	9.927	9.904	9.924	10.224	10.200	10.203	9.891	9.935	10.106
USD	5.151	5.266	5.324	5.364	5.449	5.403	5.394	5.256	5.212	4.931	5.060	5.096
SEK	110.40	113.48	115.59	116.61	117.08	117.25	118.84	118.43	117.83	114.92	115.88	116.24
DEM	243.25	253.85	261.81	262.85	258.77	259.37	262.75	263.29	264.45	267.45	266.42	270.98
FRF	109.24	108.92	112.99	117.03	117.26	118.00	121.57	120.91	119.56	117.03	116.50	117.93
1979												
GBP	10.16	10.21	10.39	10.66	10.68	10.89	11.40	11.26	10.95	10.67	10.70	10.95
USD	5.065	5.096	5.098	5.142	5.188	5.159	5.042	5.030	4.983	4.968	5.025	4.978
SEK	116.60	116.74	116.77	117.15	118.10	118.86	119.50	119.23	118.89	118.10	118.88	119.16
DEM	274.21	274.62	274.11	271.64	272.03	273.82	276.59	275.08	277.59	277.93	283.19	287.17
FRF	119.49	119.32	118.96	118.25	117.69	118.20	118.82	118.17	118.67	118.45	120.70	122.55
1980												
GBP	11.12	11.19	11.14	11.23	11.31	11.35	11.43	11.53	11.62	11.83	12.03	12.13
USD	4.911	4.882	5.047	5.059	4.912	4.857	4.818	4.867	4.838	4.895	5.015	5.169
SEK	118.48	117.12	116.24	116.15	116.60	116.57	116.80	116.58	116.45	116.83	116.55	117.40
DEM	285.00	279.53	273.19	271.05	274.24	274.80	275.85	271.89	270.41	266.14	261.27	262.33
FRF	121.67	119.27	117.13	116.82	117.47	118.10	118.86	117.32	116.36	115.14	112.90	113.32
1981												
GBP	12.59	12.44	12.04	11.93	11.85	11.69	11.45	11.26	10.85	10.90	11.07	11.05
USD	5.234	5.417	5.397	5.467	5.668	5.908	6.098	6.181	5.974	5.913	5.818	5.791
SEK	117.87	117.58	117.17	116.67	115.82	117.05	117.72	116.60	110.33	106.82	106.10	104.50
DEM	260.99	252.44	256.06	253.37	247.33	248.77	250.05	247.25	253.35	262.83	261.46	256.50
FRF	112.90	108.92	108.65	107.21	103.27	104.45	105.23	103.44	105.85	105.25	103.72	101.40
XEU	6.735	6.529	6.510	6.428	6.278	6.299	6.307	6.226	6.310	6.420	6.391	6.278
1982												
GBP	11.07	11.03	10.90	10.78	10.81	10.87	11.02	11.53	11.82	12.17	11.83	11.38
USD	5.863	5.968	6.026	6.082	5.964	6.188	6.352	6.678	6.895	7.168	7.245	7.027
SEK	104.45	103.64	103.35	102.91	103.26	102.81	103.94	108.84	110.84	100.60	96.51	95.64
DEM	255.91	252.33	253.34	253.89	258.46	254.91	257.76	269.59	275.75	283.49	283.49	290.73
FRF	100.74	99.24	98.20	97.48	99.21	94.29	92.71	96.54	97.66	100.30	100.39	102.65

Table A3. Selected exchange rates monthly 1941 - 2003

Monthly averages of daily quotations at Oslo Stock Exchange

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
XEU	6.256	6.166	6.105	6.074	6.164	6.051	6.087	6.361	6.492	6.669	6.633	6.713
1983												
GBP	11.11	10.91	10.71	11.00	11.21	11.26	11.20	11.21	11.14	10.96	11.03	11.07
USD	7.045	7.112	7.173	7.137	7.112	7.261	7.323	7.463	7.426	7.321	7.464	7.716
SEK	96.29	95.72	95.98	95.34	94.89	95.15	95.30	94.95	94.32	94.10	94.34	95.78
DEM	295.16	293.08	297.95	292.80	288.26	285.14	283.18	279.09	278.40	281.43	278.28	280.88
FRF	104.14	103.39	102.65	97.64	95.81	94.79	94.18	92.76	92.16	92.11	91.47	92.11
XEU	6.779	6.716	6.740	6.608	6.535	6.482	6.440	6.359	6.327	6.342	6.297	6.344
1984												
GBP	11.09	11.08	10.93	10.81	10.86	10.77	10.84	10.90	10.84	10.82	10.82	10.66
USD	7.867	7.702	7.499	7.591	7.814	7.818	8.205	8.301	8.609	8.870	8.704	8.975
SEK	96.32	96.14	97.01	96.96	96.69	96.52	98.87	99.36	100.45	102.14	101.51	101.40
DEM	280.33	284.77	289.01	287.65	284.14	285.46	288.36	287.56	284.89	289.04	291.27	289.49
FRF	91.68	92.54	93.77	93.51	92.50	92.89	93.95	93.69	92.83	94.25	94.94	94.49
XEU	6.330	6.392	6.453	6.421	6.366	6.380	6.449	6.440	6.384	6.457	6.497	6.461
1985												
GBP	10.36	10.37	10.62	11.08	11.17	11.29	11.64	11.42	11.38	11.25	11.23	11.07
USD	9.171	9.449	9.481	8.899	8.964	8.818	8.452	8.234	8.341	7.908	7.800	7.650
SEK	101.20	101.50	100.66	99.38	99.62	99.63	99.57	99.21	99.38	99.40	99.96	99.65
DEM	289.63	287.23	286.76	289.28	287.89	287.97	289.79	295.28	293.81	299.09	300.82	304.27
FRF	94.60	93.95	93.86	94.78	94.45	94.45	95.31	96.68	96.30	98.09	98.70	99.50
XEU	6.442	6.391	6.391	6.468	6.453	6.465	6.520	6.573	6.542	6.615	6.642	6.677
1986												
GBP	10.77	10.41	10.44	10.71	11.31	11.48	11.28	10.93	10.81	10.49	10.73	10.82
USD	7.550	7.286	7.126	7.155	7.441	7.613	7.471	7.354	7.335	7.349	7.532	7.528
SEK	99.45	98.49	98.58	98.83	104.05	105.65	105.79	106.15	106.18	106.82	108.19	109.04
DEM	309.20	312.14	315.40	314.69	333.53	340.57	346.93	356.43	359.45	366.67	371.90	378.27
FRF	100.80	101.71	102.60	99.34	104.72	106.87	107.82	109.39	109.81	112.02	113.72	115.22
XEU	6.733	6.751	6.812	6.781	7.179	7.319	7.398	7.509	7.542	7.639	7.754	7.871
1987												
GBP	10.80	10.70	11.02	11.03	11.11	10.93	10.88	10.85	10.93	11.01	11.39	11.65
USD	7.172	7.008	6.927	6.771	6.651	6.712	6.755	6.792	6.644	6.627	6.416	6.375
SEK	108.52	107.77	108.02	107.26	106.47	105.86	104.98	104.74	104.23	104.33	105.74	107.35
DEM	385.82	383.80	377.77	373.89	372.55	368.96	365.83	365.75	366.62	367.59	381.56	390.33
FRF	115.77	115.23	113.51	112.29	111.47	110.49	109.87	109.57	109.81	110.11	112.40	115.15
XEU	7.967	7.917	7.840	7.767	7.735	7.655	7.595	7.581	7.605	7.630	7.870	8.054
1988												
GBP	11.45	11.27	11.59	11.64	11.55	11.37	11.45	11.70	11.63	11.71	11.88	11.89
USD	6.345	6.414	6.336	6.208	6.184	6.377	6.707	6.891	6.909	6.753	6.570	6.510
SEK	106.42	106.04	106.51	105.48	104.78	104.77	105.85	106.42	107.34	107.59	107.94	107.13
DEM	384.38	377.95	377.46	371.18	365.22	363.76	364.08	365.08	370.22	370.67	375.62	371.11
FRF	113.89	111.87	111.26	109.37	107.84	107.82	108.03	107.86	108.84	108.67	109.97	108.62
XEU	7.940	7.806	7.815	7.704	7.595	7.557	7.567	7.602	7.674	7.685	7.786	7.710
1989												
GBP	11.85	11.78	11.65	11.55	11.45	11.16	11.27	11.24	11.19	11.02	10.85	10.70
USD	6.663	6.717	6.790	6.790	7.050	7.185	6.952	7.041	7.123	6.942	6.897	6.705
SEK	106.63	106.36	106.49	106.73	107.01	107.50	107.50	107.68	107.85	107.69	107.37	106.56
DEM	364.34	362.81	364.16	363.28	361.17	362.79	367.15	365.48	364.93	372.21	376.90	385.12
FRF	106.90	106.56	107.43	107.44	106.76	106.94	108.27	108.20	108.08	109.65	110.86	112.72
XEU	7.594	7.560	7.577	7.558	7.517	7.517	7.602	7.576	7.567	7.642	7.714	7.817

Table A3. Selected exchange rates monthly 1941 - 2003

Monthly averages of daily quotations at Oslo Stock Exchange

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1990												
GBP	10.80	10.97	10.71	10.72	10.82	11.07	11.39	11.57	11.42	11.51	11.40	11.30
USD	6.541	6.471	6.589	6.551	6.444	6.473	6.303	6.085	6.074	5.920	5.805	5.861
SEK	106.02	105.79	106.94	107.04	106.47	106.28	105.92	105.35	105.36	104.92	104.36	104.32
DEM	386.62	386.05	386.55	387.93	387.74	384.32	384.35	387.39	386.90	388.25	390.56	392.25
FRF	113.60	113.69	114.53	115.52	115.18	114.26	114.57	115.47	115.52	115.94	116.03	115.50
XEU	7.855	7.881	7.894	7.936	7.950	7.925	7.959	8.041	8.012	8.035	8.057	8.048
1991												
GBP	11.42	11.38	11.44	11.59	11.54	11.48	11.50	11.48	11.45	11.40	11.33	11.25
USD	5.906	5.787	6.225	6.624	6.679	6.960	6.978	6.819	6.644	6.620	6.378	6.169
SEK	104.79	104.60	106.23	108.29	108.76	108.32	107.83	107.63	107.52	107.45	107.46	107.67
DEM	391.15	391.26	390.49	388.97	389.57	390.42	390.15	390.74	391.29	391.53	392.72	393.90
FRF	115.15	114.94	114.73	115.11	114.87	115.07	114.94	114.97	114.97	114.85	114.93	115.27
XEU	8.064	8.050	8.024	8.020	8.005	8.024	8.019	8.021	8.021	8.019	8.017	8.011
1992												
GBP	11.227	11.279	11.238	11.336	11.457	11.407	11.236	11.110	10.743	10.014	9.884	10.360
USD	6.196	6.350	6.519	6.454	6.322	6.155	5.854	5.725	5.796	6.037	6.468	6.684
SEK	107.95	108.02	108.15	108.26	108.32	108.29	108.33	108.31	108.18	108.18	104.25	96.86
DEM	393.05	392.04	392.29	391.81	390.19	390.93	392.79	394.49	400.00	408.05	407.64	422.48
FRF	115.24	115.17	115.55	115.85	116.07	116.14	116.40	116.29	117.56	120.27	120.50	123.89
XEU	8.012	8.015	8.023	8.025	8.017	8.015	8.019	8.019	7.969	7.971	8.005	8.271
1993												
GBP	10.54	10.04	10.22	10.47	10.53	10.55	10.93	10.99	10.79	10.77	10.95	11.07
USD	6.877	6.980	7.004	6.765	6.794	6.981	7.308	7.365	7.082	7.164	7.390	7.420
SEK	94.89	92.74	90.51	91.01	92.71	94.00	91.83	91.42	88.42	89.30	89.42	88.87
DEM	425.67	425.31	425.22	424.19	423.06	422.84	426.04	434.07	436.37	437.54	434.66	433.93
FRF	125.51	125.57	125.16	125.44	125.50	125.61	125.14	124.04	124.73	124.68	125.07	126.90
XEU	8.340	8.266	8.250	8.262	8.271	8.269	8.301	8.284	8.291	8.309	8.338	8.376
1994												
GBP	11.21	11.08	10.96	10.92	10.81	10.79	10.61	10.58	10.64	10.63	10.69	10.69
USD	7.511	7.495	7.349	7.365	7.183	7.079	6.867	6.862	6.804	6.622	6.727	6.855
SEK	92.37	93.87	92.85	93.44	93.10	90.65	88.41	88.67	90.26	91.20	91.51	91.21
DEM	430.91	431.48	434.08	433.71	433.44	434.26	437.28	438.64	438.68	435.43	437.13	436.07
FRF	126.82	126.99	127.38	126.59	126.59	127.11	127.60	128.01	128.25	127.20	127.32	126.62
XEU	8.363	8.370	8.379	8.384	8.353	8.352	8.355	8.360	8.369	8.305	8.324	8.311
1995												
GBP	10.549	10.363	10.034	9.960	9.989	9.945	9.845	9.941	9.968	9.844	9.768	9.774
USD	6.701	6.594	6.269	6.188	6.285	6.236	6.173	6.340	6.399	6.238	6.247	6.352
SEK	89.74	89.30	86.25	84.31	86.24	85.93	85.99	87.72	89.71	91.30	94.72	95.77
DEM	437.36	439.05	446.13	449.27	447.11	445.10	444.41	438.90	437.89	440.96	441.11	440.94
FRF	126.50	126.23	125.91	127.87	126.40	126.80	127.66	127.59	126.95	126.24	127.86	127.98
XEU	8.287	8.254	8.169	8.234	8.234	8.222	8.228	8.212	8.172	8.101	8.099	8.104
1996												
GBP	9.816	9.837	9.814	9.844	9.959	10.073	10.021	9.933	10.065	10.271	10.564	10.762
USD	6.416	6.405	6.428	6.500	6.576	6.531	6.450	6.409	6.456	6.484	6.352	6.466
SEK	95.44	93.04	95.47	96.65	96.68	97.82	97.14	96.84	97.21	98.26	95.92	94.80
DEM	439.09	436.82	435.00	431.37	429.01	427.68	428.69	432.47	428.94	424.45	420.40	416.73
FRF	128.23	127.03	127.05	127.14	126.79	126.19	126.60	126.66	125.96	125.51	124.24	123.35
XEU	8.101	8.027	8.062	8.074	8.077	8.091	8.098	8.134	8.129	8.128	8.073	8.040
1997												

Table A3. Selected exchange rates monthly 1941 - 2003

Monthly averages of daily quotations at Oslo Stock Exchange

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GBP	10.72	10.76	10.94	11.35	11.53	11.84	12.42	12.23	11.70	11.55	11.90	12.05
USD	6.448	6.624	6.818	6.966	7.061	7.204	7.432	7.629	7.316	7.075	7.054	7.250
SEK	91.41	89.50	89.03	90.71	92.03	93.07	95.22	95.41	95.03	93.44	93.33	93.09
DEM	402.35	395.76	401.40	407.51	414.75	417.46	415.44	413.96	409.06	402.66	407.40	407.85
FRF	119.22	117.23	118.98	120.98	122.98	123.68	123.14	122.82	121.69	120.02	121.67	121.84
XEU	7.811	7.682	7.793	7.949	8.084	8.155	8.194	8.147	8.024	7.912	8.058	8.071
1998												
GBP	12.25	12.38	12.58	12.59	12.19	12.49	12.53	12.59	12.72	12.58	12.38	12.67
USD	7.488	7.555	7.577	7.526	7.444	7.572	7.623	7.711	7.577	7.428	7.451	7.589
SEK	93.46	93.52	95.13	96.28	96.81	95.74	95.45	94.87	95.77	94.64	93.22	94.20
DEM	412.39	416.40	415.05	415.08	419.54	422.56	424.09	431.27	444.55	453.18	443.16	454.73
FRF	123.15	124.22	123.81	123.82	125.11	126.03	126.50	128.64	132.58	135.16	132.16	135.60
XEU	8.146	8.222	8.231	8.226	8.265	8.347	8.380	8.506	8.745	8.929	8.713	8.925
1999												
GBP	12.30	12.56	12.67	12.52	12.52	12.56	12.44	12.51	12.72	12.83	12.86	12.93
USD	7.452	7.719	7.817	7.774	7.751	7.870	7.903	7.791	7.835	7.742	7.924	8.011
SEK	95.27	97.10	95.15	93.22	91.81	92.51	93.55	94.38	95.29	94.97	94.88	94.31
DEM	442.33	442.25	434.92	425.10	421.16	417.58	418.29	422.34	420.64	423.78	418.78	413.98
FRF	131.89	131.86	129.68	126.75	125.57	124.51	124.72	125.93	125.42	126.36	124.87	123.43
EUR	8.651	8.650	8.506	8.314	8.237	8.167	8.181	8.260	8.227	8.289	8.191	8.097
2000												
GBP	13.14	13.18	13.28	13.63	13.64	13.10	13.12	13.34	13.21	13.58	13.32	13.26
USD	8.013	8.236	8.411	8.608	9.047	8.679	8.702	8.956	9.206	9.361	9.337	9.066
SEK	94.47	95.16	96.70	98.62	99.49	99.12	97.26	96.48	95.39	93.88	92.66	93.90
DEM	415.24	414.10	414.71	416.90	419.34	421.43	418.05	413.94	410.40	409.20	408.78	415.86
FRF	123.81	123.47	123.65	124.30	125.03	125.66	124.65	123.42	122.37	122.01	121.88	123.99
EUR	8.121	8.099	8.111	8.154	8.202	8.243	8.176	8.096	8.027	8.003	7.995	8.133
2001												
GBP	12.97	12.96	12.97	13.05	13.04	13.02	13.10	12.85	12.84	12.82	12.81	12.90
USD	8.778	8.912	8.974	9.094	9.144	9.299	9.264	8.947	8.781	8.829	8.919	8.955
SEK	92.48	91.49	89.42	89.04	88.24	86.16	86.05	86.52	82.70	83.50	84.14	84.77
DEM	421.08	419.90	417.22	415.08	408.79	405.65	407.57	411.86	408.96	408.88	405.07	408.63
FRF	125.55	125.20	124.40	123.76	121.89	120.95	121.52	122.80	121.94	121.91	120.78	121.84
EUR	8.236	8.213	8.160	8.118	7.995	7.934	7.971	8.055	7.999	7.997	7.922	7.992
2002												
GBP	12.85	12.73	12.53	12.42	11.96	11.50	11.60	11.68	11.68	11.65	11.49	11.36
USD	8.968	8.948	8.812	8.605	8.192	7.753	7.464	7.598	7.507	7.482	7.309	7.168
SEK	85.84	84.78	85.19	83.44	81.53	81.25	79.90	80.32	80.30	80.62	80.59	80.20
DEM	404.98	398.06										
FRF	120.75	118.69										
EUR	7.921	7.785	7.719	7.622	7.515	7.405	7.405	7.428	7.362	7.341	7.319	7.295
2003												
GBP	11.16	11.26	11.49	11.37	11.04	11.63	11.84	11.81	11.76	11.80	11.83	11.74
USD	6.904	7.003	7.261	7.224	6.803	7.002	7.290	7.415	7.307	7.037	7.007	6.709
SEK	79.93	82.49	85.03	85.56	85.97	89.51	90.24	89.37	90.37	91.32	91.14	91.34
EUR	7.333	7.544	7.845	7.832	7.871	8.162	8.289	8.256	8.195	8.228	8.197	8.241