DANMARKS NATIONALBANK

# DANMARKS NATIONALBANK WORKING PAPERS 2009 • 60

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**February 2009**

ISSN (trykt/print) 1602-1185

ISSN (online) 1602-1193

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February 2009

[1] The author wishes to thank colleagues from Danmarks Nationalbank for useful comments on preliminary versions of this paper. The author alone is responsible for any remaining errors.

**Abstract**

The paper presents a consumer price index for Denmark 1502-2007. For the post-1815 period the index is based on existing CPI figures whereas new data has been constructed for the pre-1815 period. For the earliest years 1502-1712 the new CPI covers only the price of corn, whereas the period 1712-1800 is based on the comprehensive price material collected in relation to the recently completed Danish Price History Project. If one define price stability as an inflation rate around 2 per cent per annum, or lower, the past five centuries in Denmark has been dominated by price stability. Disregarding actual war periods there seems only to have been one major exception from the overall picture of price stability: The first four decades following the end of the Second World War where inflation expectations lost their anchor.

*Key words*: Inflation, consumer prices index, price history.

*JEL Classification*: C43; E31; N13; N14.

**Resumé (Danish summary)**

I papiret præsenteres et forbrugerprisindeks for Danmark 1502-2007. For perioden efter 1815 er indekset baseret på eksisterende forbrugerprisindeks, mens der konstrueres nye data for perioden før 1815. For de tidligste år 1502-1712 omfatter det nye forbrugerprisindeks udelukkende kornpriser, mens perioden 1712-1800 er baseret på det omfattende prismateriale, som er indsamlet i relation til det nyligt afsluttede projekt om Dansk Prishistorie. Hvis man definerer prisstabilitet som en årlig inflationsrate på omkring 2 pct. eller derunder, har de sidste fem århundrede i Danmark været domineret af prisstabilitet. Ses der bort fra egentlige krigsperioder er der kun én enkelt undtagelse fra det overordnede billede af prisstabilitet: De første fire årtier efter afslutningen af 2. verdenskrig, hvor inflationsforventningerne mistede deres anker.

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## 1. Introduction

The focus on price stability within the central-banking community during the most recent decades has created a renewed research interest in long-span historical time series on price developments. Norges Bank published e.g. a comprehensive collection of historical monetary statistics in 2004, which included a new consumer price index for Norway 1516-2003[2], and more recently Sveriges Riksbank has published a consumer price index for Sweden 1290-2006[3].

An "official" consumer price index (CPI) for Denmark is available from Statistics Denmark for the period since 1914, and data back to 1815 have been constructed in relation to various historical studies on economic growth and cost of living. However, so far no Danish CPI has been available for the period prior to 1815.

The paper at hand presents a consumer price index for Denmark 1502-2007. For the post-1815 period the index is based on existing CPI figures whereas new data has been constructed for the pre-1815 period. For the earliest years 1502-1712 the new CPI covers only the price of corn, whereas the period 1712-1800 is based on the comprehensive price material collected in relation to the Danish Price History Project 1660-1800, which was initiated in 1939 and completed in 2004. Furthermore, the paper offers a brief review of the inflationary development in Denmark during the past five centuries based on the new CPI data.

## 2. A CPI for Denmark 1502-2007 - Data sources and compilation methods

The description of the main sources and methods applied for the construction of the CPI for Denmark 1502-2007 can be divided in eight parts covering eight different time spans, cf. the exposition below. For each subperiod a CPI was constructed, and these indices were subsequently chained together to the overall index. Annex A lists the new CPI data set which also is available in electronic form on request from the author.

The geographical coverage of the index prior to 1920 is the Kingdom of Denmark excluding Norway[4], the Royal Duchies Schleswig and Holstein[5] and other former Danish

[2] Cf. Grytten (2004).
[3] Cf. Edvinsson & Söderberg (2007).
[4] With the peace settlement in Kiel in January 1814 Norway became independent of Denmark after more than 400 years of union.
[5] Schleswig and Holstein were attached to the Danish monarchy in 1460 but became part of Germany after the Second Schleswig War in 1864. In June 1920 Sønderjylland (the northern part of the old Duchy of Schleswig) was reunited with Denmark after a referendum in accordance with the Versailles Treaty.

territories[6]. Since 1920 the coverage correspond to the current geographical delimitation of Denmark.

An important issue to consider in relation to long-term historical price studies is the choice of currency unit (mint standard) in periods where notes and coins based on several different currency units circulated simultaneously. The aim of the paper at hand has been to use prices quoted in the currency unit most frequently used for transactions purposes at the time of transaction and then subsequently chain these indices together in order to avoid break in series. The choice of currency units used in different periods is illustrated in table 1.

***Table 1: Currency unit of the price quotations used for the Danish CPI 1502-2007 (a)***

| Period | Currency unit |
|---|---|
| 1502-1640 | Speciedaler (b) |
| 1640-1671 | Kroner (also denoted "sletdaler") |
| 1671-1813 | Kurantdaler |
| 1813-1875 | Rigsbankdaler (renamed "rigsdaler" in 1854) |
| 1875-2007 | Kroner |

Notes:

(a) In some cases the sources are not clear on which currency unit has been used for the price quotation, especially in the period 1620-1725 when speciedaler gradually was replaced by sletdaler and later kurantdaler. The sources just quote the prices in rigsdaler and skilling. However, table 1 represents the best "guess". Scharling (1869) has e.g. examined the farm gate prices used for the assessment of tithes in Sjællands Stift in the period 1640-1672 and concludes that the original prices were fixed in sletdaler, cf. page 236-237 in Scharling, *op.cit.*

(b) In the sources behind the CPI the prices in the period 1502-1640 are quoted in rigsdaler with a fixed silver content, i.e. the prices in this period are "silver prices". The speciedaler was first minted in Denmark in 1541. However, prices for the whole period 1502-1640 has been converted to speciedaler with a fixed silver content.

According to international statistical guidelines CPIs are:

> "... index numbers that measure changes in the prices of goods and services purchased or otherwise acquired by households, which households use directly, or indirectly, to satisfy their own needs and wants."[7]

The guidelines contain detailed recommendations for the proper methodology and data sources that should be used for compiling modern CPIs of a high statistical quality. However, even though an attempt has been made to transform the primary data into a reasonable consistent time series on consumer price inflation, the quality of a data set spanning more

[6] Skåne, Halland, Blekinge were lost to Sweden following the end of the First Karl Gustav War in 1658. Iceland became a sovereign state in personal union with Denmark in 1918. The personal union between Denmark and Iceland ceased in 1944.

[7] Quotation from §1.3 in ILO *et al.* (2004).

than 500 years is always questionable. Data availability also seriously limits the choice of methodology used for the compilations. Furthermore, both retail and wholesale markets have changed a lot during the period regarding e.g. the organisation and structure of the trade sector, the degree of product differentiation, the composition of private consumption, the size of ordinary households *etc*., cf. also Kackmeister (2007). The results and conclusions of the paper at hand have therefore to be taken with "a pinch of salt".

***1502-1660***

Consistent information on the price development in Denmark in the period prior to 1660 is very scarce. For this period corn prices has been used as a proxy for the development in consumer prices. The sources are Falbe-Hansen (1869) and Scharling (1869).[8]

For the 1552-1600 period these authors offer annual observations on prices on rye and barley and for 1600-1660 on rye, barley and oats based mainly on accounting records from the University of Copenhagen supplemented with farm gate prices used for the assessment of tithes in Sjællands Stift. Scharling, *op.cit*., notes[9] that Sjællands Stift is normally believed to be representative for the corn price development in Denmark during this period.[10] For the period 1552-1660 the price series are fairly complete with only a few years of missing observations.

The authors mentioned above also list prices on rye and barley prior to 1552. However, this information is more fragmented and based on a wider range of sources. Reliable price information is only available for 1502, 1510, 1525, 1531, 1532, 1538, 1539, 1545 and 1546.[11]

Missing observations has been filled with geometric interpolations, and for the period 1502-1660 the CPI index is based on an unweighted geometric average of the percentage development in the corn prices stated above.

Due to the nature of the price material and the simple calculation method the CPI data for the period 1502-1660 can only be expected to give a rough picture of the general price development in Denmark. Especially prior to 1552 the annual fluctuations in the series are hard to interpret due to interpolations.

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[8] Following the death of Professor Holdt in 1867, the University of Copenhagen arranged a competition in relation to the open position as professor in economics. The contestants were given one year to deliver a dissertation on the price development in Denmark since 1492. Scharling and Falbe-Hansen were the only participants in the competition and the publications, *op.cit*., represent their contributions. Scharling won the competition and thereby the professorship, whereas Falbe-Hansen joined the staff of Statistics Denmark instead. However, in 1877 Falbe-Hansen obtained a professorship in economics at the University without the need to participate in a new competition, cf. Hansen (1976a, 1976b).

[9] Cf. page 233 in Scharling (1869).

[10] This assumption seems plausible. For the period 1660-1712 the correlation coefficient between the annual increases in corn prices in Sjællands Stift and Denmark as a whole was 0.95.

[11] On page 39 in Falbe-Hansen (1869) information on the prices of corn in 1467 is also stated. However, Falbe-Hansen notes that these prices - related to the payment of the 1467 tax - are probably fixed at a too low level in order to encourage payment of the tax in cash rather than in kind.

***1660-1712***

For the period 1660-1712 consistent information on the price development in Denmark is still limited. For this period the CPI index is based on the farm gate prices on rye, barley and oats reported in Statistics Denmark (1904). The CPI is compiled as an unweighted geometric average of the percentage development in 27 individual price series on the three corn products mentioned above.

The price material in Statistics Denmark, *op.cit*., consists of average winter prices used for the assessment of tithes in 6 dioceses[12] and there are no missing observations. The basic fixing rules for these prices were stated by regulation, and Statistics Denmark notes that although minor differences in the methods of calculation might have occurred from region to region this source of error is believed to be of insignificant importance.[13] Statistics Denmark furthermore notes, that although the farm gate prices used for the assessment of tithes might have differed from market prices, they are still representative for the price development of at least a part of the farmers households budget expenditures during the pre-1712 period.[14] Part of the land rent was e.g. often paid in grain[15], and grain probably constituted a larger share in the average consumer basket than in later periods. The Danish mint and price historian, Axel Nielsen, also finds the price material in Statistics Denmark (1904) to be of a high quality suitable for historical studies, including his own study on prices in Denmark 1650-1750, cf. Nielsen (1904, 1906).

***1712-1800***

For the period 1712-1800 the new consumer price index is based on the outcome of the Danish Price History Project which was initiated in 1939 and completed in 2004. Two comprehensive studies from this research project have been published, cf. Friis & Glamann (1958) and Andersen & Pedersen (2004).

Andersen & Pedersen, *op.cit*., presents annual weighted averages on purchase and sales prices 1661-1800 for a wide range of commodities based on accounting records from 19 Danish estates and manors[16] in the Danish countryside. The prices are free market prices from actual transactions[17], and a large number of the goods covered were common in private consumption. Even though manors were large economic units compared to ordinary

[12] Sjælland, Fyn, Aalborg, Viborg, Aarhus and Ribe.
[13] Cf. page 108 in Statistics Denmark (1904).
[14] Cf. page 109 in Statistics Denmark (1904).
[15] Cf. e.g. Henriksen (2006).
[16] On Zealand: Giesegaard, Bregentved, Gisselfeld, Herlufsholm, Holsteinborg, Fuirendal, Sorø, Løvenborg, Gaunø and Juellinge. On Funen: Taasinge, Frederiksgave and Erholm. In Jutland: Frijsenborg, Fussingsø, Støvringgaard, Støvringgaard household accounts, Lindenborg and Odden.
[17] Transactions involving payment in kinds (e.g. manorial dues) are excluded.

households, the purchase prices on consumption goods reported in this study is probably the closest that one can come to transaction-based consumer prices for the pre-1800 period Denmark outside Copenhagen based on sources currently available. None of the estate accounts contains data for the entire period since 1660. Especially for the pre-1700 period the price series are relatively few and fragmented, but for the period 1712-1800 they are fairly complete.

Friis & Glamann, *op.cit*., presents the Magistrate's official prices (assizes) of bread and meat in Copenhagen in the period 1684-1800. Thestrup (1971) has compared a selection of these official prices with information on transaction prices from five Danish estates, the Asiatic Company and the merchant Niels Ryberg. The overall impression is that the official prices track the transaction prices quite well.[18]

***Table 2: Commodities and budget weights in the Danish CPI 1712-1800***

| Consumption group | Commodities | Budget weight |
|---|---|---|
| Bread, flour and groats | Flour, buckwheat groats, pearl-barley, hulled rice, coarse rye bread, fine rye bread, wheat bread | 0.15 |
| Meat and fish | Pigs, lambs, geese, ducks, hens, capons, chickens, beef, veal, pork, herring, train oil | 0.29 |
| Fat, milk, eggs and cheese | Butter, cheese, eggs, milk, cream | 0.10 |
| Vegetables and fruit | Peas, apples, lemons, raisins, currants, olive oil | 0.02 |
| Sugar and chocolate | Sugar, cocao | 0.04 |
| Spices, tea and coffee | Black pepper, mace, cinnamon, cardamons, cloves, ginger, coffee, tea, salt | 0.02 |
| Beverages and tobacco | Beer, Danish brandy | 0.11 |
| Footwear, textiles and clothing | Cloth, linen | 0.14 |
| Light and fuel | Charcoal, tallow, tallow candles, coal | 0.08 |
| Other goods | Green soap | 0.04 |
| Total | | 1.00 |

Utilising the data in Andersen & Pedersen (2004) and Friis & Glamann (1958) individual price series for 50 representative commodities divided into 10 consumption groups were established, cf. table 2. Missing observations in the individual price series were filled by geometric interpolation. For each of the 10 consumption groups a price index was

subsequently compiled based on an unweighted geometric[19] average of the percentage development in the individual prices within the group. The total CPI for 1712-1800 could then be compiled as a Laspeyres type index utilising the budget weights shown in table 2. These budget weights are based on the composition of private consumption expenditures in 1844 in the Danish national account statistics compiled by Hansen (1983). The 10 commodity groups represented 81 per cent of the private consumption expenditures in 1844. The year 1844 is the earliest year for which Hansen, *op. cit*., offers a detailed commodity breakdown in his historical national-account calculations. It seems to be a fairly representative choice of base year due to the absence of war, epidemics, major domestic and international crises *etc*.

The items within the private consumption not covered by the CPI in the period 1712-1800 are transport, services, durable goods and rent.

***1800-1815***

This period causes a number of special problems for the construction of a Danish CPI. During the Napoleonic Wars the huge central-government budget deficits was to a large extent financed by a massive issuing of kurant-denominated bank notes. The result was a period with hyperinflation and a collapse of the Danish monetary system.

By a monetary reform in January 1813 the two existing note-issuing banks within the Danish monarchy were closed and a new temporary state-owned bank, the Rigsbank, was established. The Rigsbank was granted the privilege to issue rigsbankdaler-denominated bank notes with the status of being the sole legal tender within Denmark, Norway and in the Royal Duchies Schleswig and Holstein. At the same time Kurantbank notes in circulation was written down by being exchanged for the new Rigsbank notes at the ratio 6 to 1. The same ratio was applied to kurant-denominated central-government debt.[20] The monetary reform were therefore given the nickname the "bankruptcy of the state".[21] However, the market value of Kurantbank notes vis-à-vis silver was far below par just before the monetary reform. By the monetary reform in 1813 kurantbank notes were thus by and large written down according to market rates.[22]

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[18] The bakers normally adjusted the weight of different kinds of bread in line with fluctuation in the corn prices in order to make a profit when they had to sell bread at the officially fixed prices. However, the price series for bread in Friis & Glamann, *op.cit.* are calculated for bread of a fixed weight.

[19] A geometric average has been chosen at this stage of the calculations in line with the recommendation in ILO *et al.* (2004).

[20] If the creditor called the loan. Kurant-denominated central-government debt could be converted at the ratio 1 to 1 if the creditor was willing to declare the bond irredeemable and accept a certain cut in interest-rate payments.

[21] Another reason for the nickname the "bankruptcy of the state" was the fact that the Kurantbank had been owned by the central government since 1773. The Danish monetary reform in 1813 is described in more details in e.g. Hansen & Svendsen (1968) and Hansen (1990).

[22] Cf. page 248 in Olsen (1962).

The Rigsbank could not initially ensure convergence towards the par value vis-à-vis silver of the new rigsbankdaler notes. The market value of rigsbankdaler notes reached a low point equivalent to 9 per cent of the par value in the middle of September 1813. The Rigsbank began to withdraw notes from circulation in 1814, but the market value of rigsbankdaler notes did not pass a level above 30-40 per cent of the par value in the nearest following coupe of years. The weakness of the rigsbankdaler notes in these years should be viewed in light of the reestablishment of Schleswig-Holstein as a separate currency area within the Danish monarchy in October 1813 and the separation of Denmark and Norway after the peace settlement in Kiel in January 1814. These events limited the area of circulation for the rigsbankdaler notes but without a corresponding reduction of the bank notes in circulation.

The regulation from 1813 on the Riksbank included a promissory clause stating that the Rigsbank would be restructured into a private joint stock company. This promise was fulfilled when the Nationalbank was established in 1818. Parity of the rigsbankdaler notes vis-à-vis silver coins was first achieved in 1838.

Price information for the period 1800-1815 is scarce. For this period, the CPI index is based on 60 individual farm-gate price series on 10 representative commodities reported in Statistics Denmark (1904). As mentioned above this price material consists of prices used for the assessment of tithes and the information covers 8 dioceses[23]. In the background material prices are quoted in kurantdaler for the period from 1800-1812 and rigsbankdaler for the period 1813-1815[24]. However, in order to avoid artificial break in series the prices quoted in rigsbankdaler been converted to kurantdaler at the ratio 1:6 – otherwise the price index would show a large fictive deflation in 1813 just because of the technical replacement of one currency unit by another.

***Table 3: Commodities and budget weights in the Danish CPI 1800-1815***

| Consumption group | Commodities | Budget weight |
|---|---|---|
| Corn and groats | Rye, barley, oats, wheat, buckwheat | 0.25 |
| Vegetables | White peas, grey peas | 0.04 |
| Fat | Butter | 0.17 |
| Meat | Bacon | 0.48 |
| Sugar | Honey | 0.06 |
| Total | | 1.00 |

The 60 price series on the 10 representative commodities were divided into 5 consumption groups, cf. table 3. For each of the 5 consumption groups a price index was subsequently

[23] Sjælland, Bornholm, Fyn, Lolland-Falster, Aalborg, Viborg, Aarhus and Ribe.
[24] Data for Ribe Stift is also quoted in rigsbankdaler in 1812.

compiled based on an unweighted geometric average of the percentage development in the individual price series within the group. The total CPI for 1800-1815 could then be compiled as a Laspeyres type index utilising the budget weights in table 3 based on the composition of private consumption expenditures in 1844 in the national account statistics compiled by Hansen (1983). The 5 commodity groups represented 49 per cent of the private consumption expenditures in 1844.

Due to the nature of the price material, the simple calculation method and the occurrence of hyperinflation, the CPI data for the period 1800-1815 can only be expected to give a rough picture of the general price development in Denmark in this period.

***1815-1870***

The CPI for the period 1815-1870 in the paper at hand builds on the CPI (nominal values) constructed and documented by Hansen (1983) in relation to his work on historical national accounts. The weights are based on non-published figures for the composition of the private consumption in 1840, and the price information is based on a collection of prices on a comprehensive selection of consumer goods. Hansen notes that many of the prices are wholesale prices from market places rather than actual retail prices. However, in many areas local retail stores did first emerge during this period.[25]

***1870-1872***

In his doctoral thesis at the University of Copenhagen Pedersen (1930) presents and document four different series for the cost of living in Denmark 1855-1913. The indices are based on budgets for different types of workers (skilled versus unskilled workers, urban versus farm workers). For the period 1870-1872 the development in the CPI data in the paper at hand is based on an unweighted geometric average of the percentage development in these four data series. The price material behind these series comes mainly from shops located in Odense, Aarhus and Varde supplemented with price information from departments of the Danish military located in Copenhagen, Odense, Aarhus and Næstved and from a large hospital in Copenhagen (Københavns Kommunehospital).

***1872-1914***

Statistics Denmark began publication of an "official" CPI for Denmark in 1914. However, on their website, Statistics Denmark presents a CPI for Denmark for the period 1900-1914. They have chosen the index compiled by Dalgaard (1926) who presents and document a retail price index for Denmark 1872-1924 based mainly on price information made available by staff at

[25] Cf. page 370 in Hansen (1983).

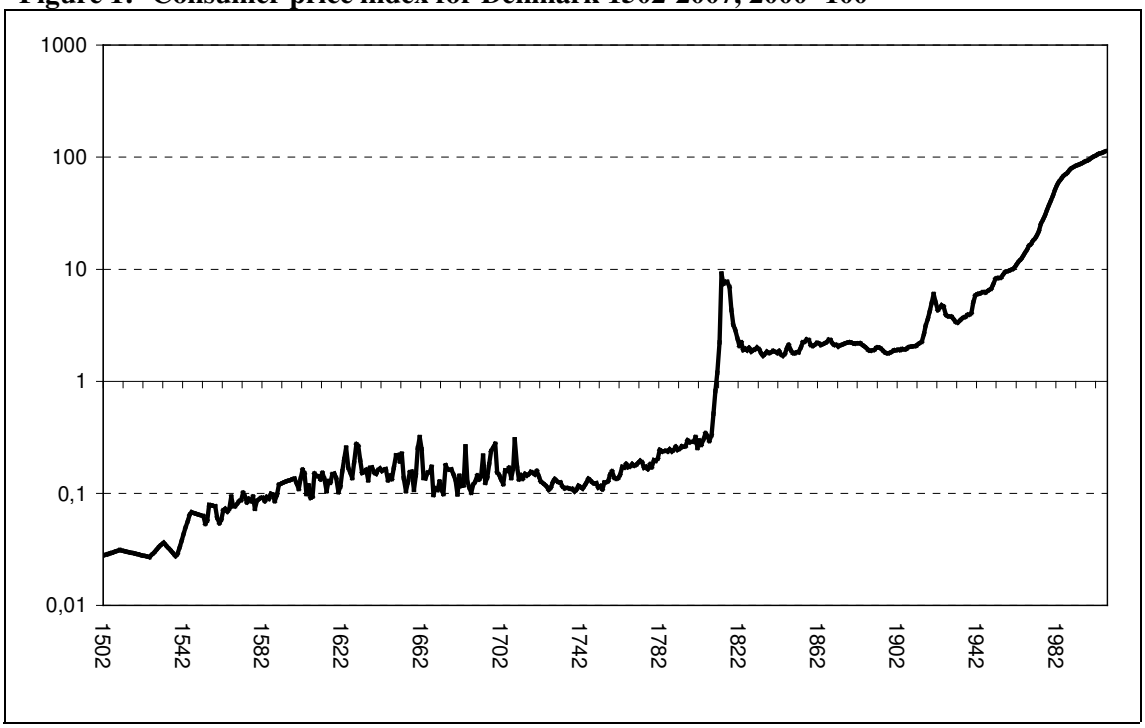
Statistics Denmark. The weights used by Dalgaard are furthermore almost identical to the weights applied in the official CPI from 1914.

In order to be consistent with Statistics Denmark, the CPI data from 1872 to 1914 in the paper at hand is based on the index (excluding direct taxes) in Dalgaard, *op.cit*. The average annual CPI inflation implied by the figures in Dalgaard, *op.cit.,* is 0.2 per cent for the period 1873-1913 which is equal to the average inflation level in the same period based on the cost of living series computed by Pedersen, *op.cit.*.

***1914-2007***

Statistics Denmark began publication of an "official" CPI for Denmark in 1914, cf. the documentation in Statistics Denmark (1985, 2004). The index is a Laspeyres type index with occasionally changes weights. For the years 1914-1963 the original official CPI included direct taxes. However, on their website, Statistics Denmark presents a recalculated CPI excluding direct taxes for the period 1914-2007. The CPI data for the period since 1914 in the paper at hand are based on these figures.

**Figure 1: Consumer price index for Denmark 1502-2007, 2000=100**



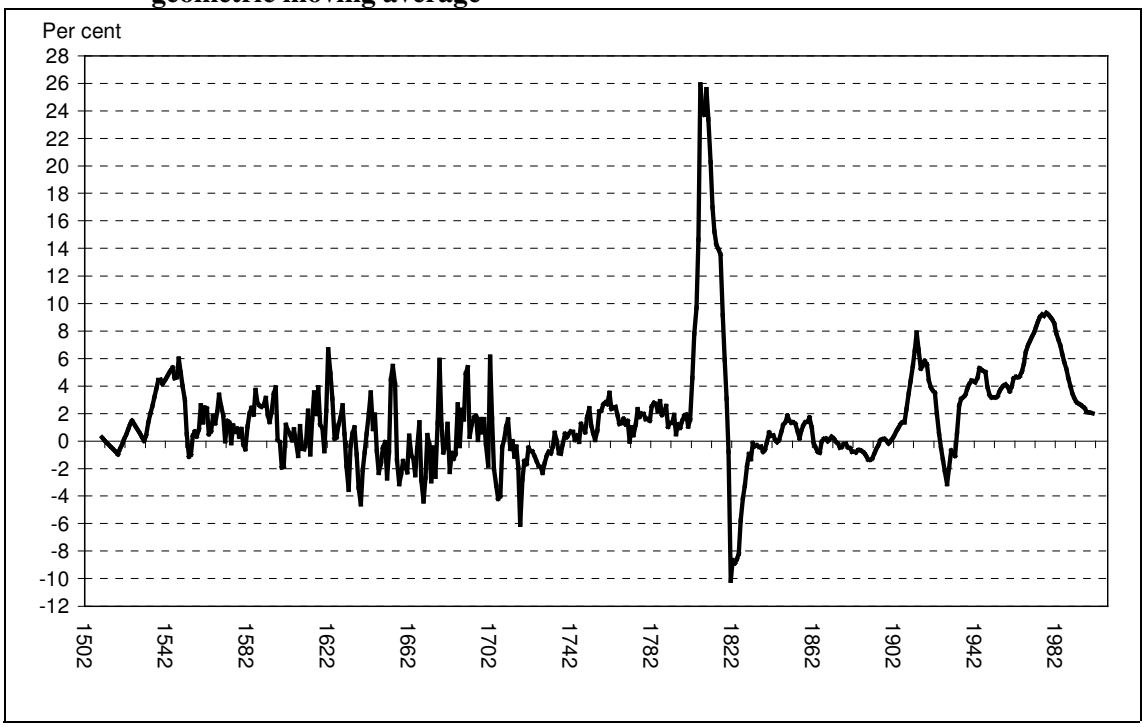

Note: Semi-logarithmic scale.
Source: See text.

## 3. Price level and inflation in Denmark 1502-2007 – A brief review

Figure 1 shows the CPI for Denmark 1502-2007 on a semi-logarithmic scale. The annual inflation rate in Denmark 1503-2007 (smoothed) is displayed in figure 2, whereas table 4

presents a range of summary statistics broken down by subperiods. Table 5 offers a closer look on selected war periods.

**Figure 2: Annual consumer price inflation in Denmark 1503-2007, 15-years centred geometric moving average**




Source: See text.

**Table 4: Inflation in Denmark 1503-2007 - summary statistics**

| Period | Average (a) | Max | Min | Standard deviation | Coefficient of variation | Deflation frequency (b) |
|---|---|---|---|---|---|---|
| | Per cent per annum | | | | | Per cent |
| 1503-1539 | 0.1 | 5.1 | -4.5 | 2.9 | 33.7 | 57 |
| 1540-1640 | 1.7 | 60.5 | -34.7 | 16.4 | 9.6 | 44 |
| 1641-1671 | -0.7 | 74.7 | -44.5 | 25.3 | -34.2 | 39 |
| 1672-1736 | -0.2 | 122.6 | -51.4 | 27.7 | -132.9 | 57 |
| 1737-1807 | 1.4 | 20.1 | -19.9 | 7.6 | 5.5 | 41 |
| 1808-1813 | 77.5 | 311.2 | 12.5 | 108.5 | 1.4 | 0 |
| 1814-1838 | -6.3 | 7.1 | -37.5 | 11.0 | -1.8 | 56 |
| 1839-1874 | 0.4 | 13.3 | -11.0 | 5.1 | 11.9 | 47 |
| 1875-1913 | 0.1 | 3.9 | -4.2 | 2.1 | 22.3 | 46 |
| 1914-1918 | 14.0 | 18.0 | 2.4 | 6.7 | 0.5 | 0 |
| 1919-1939 | -0.2 | 19.3 | -15 | 8.9 | -45.6 | 48 |
| 1940-1945 | 7.4 | 24.4 | 0.8 | 9.7 | 1.3 | 0 |
| 1946-1989 | 5.9 | 15.3 | -0.7 | 3.7 | 0.6 | 5 |
| 1990-2007 | 2.1 | 2.9 | 1.2 | 0.4 | 0.2 | 0 |
| Total | 1.7 | 311.2 | -51.4 | 20.9 | 12.6 | 40 |
| Total (excluding 1808-1813) | 1.0 | 122.6 | -51.4 | 14.9 | 15.2 | 41 |

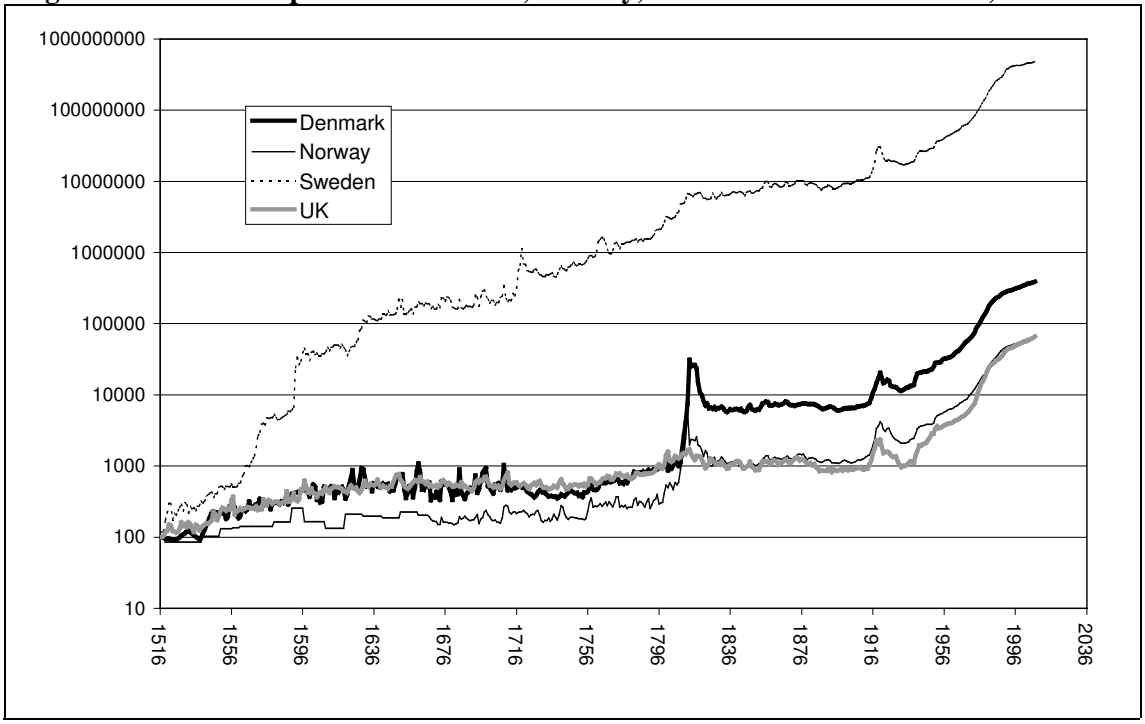
(a) The average inflation rates are calculated as compound growth rates.
(b) Number of years with deflation in per cent of the total number of years in the period.
Source: See text.

**Table 5: Inflation in Denmark during selected war periods**

| Period | War | Average (a) | Max | Min |
|---|---|---|---|---|
| | | Per cent per annum | | |
| *With Danish participation*: | | | | |
| 1563-1570 | The Nordic Seven Years War | 2.3 | 27.8 | -17.5 |
| 1611-1613 | The Kalmar War | -1.3 | 14.1 | -10.9 |
| 1625-1629 | The Kaiser War | 1.5 | 46.7 | -34.0 |
| 1643-1645 | The Torstensson War | -6.0 | 2.5 | -20.3 |
| 1657-1660 | The Karl Gustav Wars | 13.2 | 74.7 | -31.5 |
| 1675-1679 | The Scania War | -5.9 | 1.1 | -10.9 |
| 1709-1720 | The Great Nordic War | -0.4 | 83.6 | -42.2 |
| 1808-1813 | The Napoleonic Wars | 77.5 | 311.2 | 12.5 |
| 1848-1851 | The First Schleswig War | -3.7 | 2.4 | -11.0 |
| 1864 | The Second Schleswig War | 1.0 | 1.0 | 1.0 |
| 1940-1945 | World War II | 7.4 | 24.4 | 0.8 |
| *Without Danish participation*: | | | | |
| 1756-1763 | The Prussian Seven Years' War | 4.1 | 17.7 | -12.2 |
| 1853-1856 | The Crimean War | 6.8 | 10.5 | 1.9 |
| 1914-1918 | World War I | 14.0 | 18.0 | 2.4 |
| 1950-1953 | The Korean War | 5.5 | 11.7 | -0.5 |

(a) The average inflation rates are calculated as compound growth rates.
Source: See text.

**Figure 3: Consumer prices in Denmark, Norway, Sweden and UK 1516-2007, 1516=100**




Note: Semi-logarithmic scale.
Source: Denmark: Annex A; Norway: The website of Norges Bank (cf. Grytten (2004)); Sweden: The website of Sveriges Riksbank (cf. CPI2 in Edvinsson & Söderberg (2007) and Statistics Sweden); UK: Brown & Hopkins (1956) and IMF, International Financial Statistics, various issues.

Overall prices have risen by a factor of almost 4,100 since 1502. However, if one define price stability as an inflation rate around 2 per cent per annum, or lower, the past five centuries in Denmark has been dominated by price stability. The average inflation rate in the period 1503-2007 has only been 1.7 per cent per annum. There does not appear to have been a

continuously rise in the price level, but rather some periods with price stability, other periods where prices fell, and some periods with a strong and more sustained inflation.

For the period 1503-1640 prices are measured in speciedaler with a fixed silver content. The first part (1503-1539) was roughly characterised by price level stability in contrast to the second part (1540-1640) where the average annual inflation rate was 1.7 per cent. The same transition from price level stability to a positive inflation rate during the sixteenth century has also been found in many other European countries, including Norway[26], Sweden[27] and U.K[28] and various European cities[29], cf. also figure 3.

The period from the mid-1500s to the mid-1600s is usually termed the "Price Revolution" in the economic-historical literature. Traditionally the inflationary tendency during this period has been attributed to the inflow of precious metal from Central and South America, but it has been questioned whether this monetary factor was the only cause.[30] Population growth after the Black Death is another frequently mentioned factor. Population appears to have increased substantially in many European countries during the second half of the sixteenth century and the first half of the seventeenth century. No solid data is available for Denmark but population seems also to have increased rapidly in regions close to Denmark, such as Norway and Schleswig-Holstein.[31] The extraordinary rapid increase in the price level in Sweden from the mid-1500s to the mid-1600s in figure 3 was related to depreciation of the Swedish currency vis-à-vis silver (so-called coinage debasement, i.e. reduction in the silver content of the coins).[32]

The period 1540-1640 saw also several cases of major wars in Europe and Denmark, cf. table 5. These wars might have had an influence on the price development. However, the CPI for this period is only based on corn prices, which are highly dependent on variations in the weather conditions. The price effects from wars are therefore difficult to distinguish from the "normal" weather-related price shocks. Furthermore, it is possible that the war activities during this period mainly affected prices in selected regions rather than the country as a whole.

For the period 1641-1671 prices are measured in sletdaler (kroner). The average annual rate of inflation during this period was slightly negative (-0.7 per cent). However, during the Karl Gustav Wars against Sweden 1657-1660 the average annual inflation reached double-digit

[26] Cf. Grytten (2004) and Qvigstad (2005).
[27] Cf. Edvinsson & Söderberg (2007).
[28] Cf. Brown & Hopkins (1956) and Clark (2005).
[29] Cf. e.g. Van Zanden (1999), Allen (2001) and Pamuk (2005).
[30] Cf. e.g. the brief surveys in Kindleberger (1993) and Davies (2002).
[31] Cf. page 84-85 in Hansen (1964).
[32] Cf. page 12 in Edvinsson & Söderberg (2007).

figures. In the period 1641-1671 the average depreciation of kroner vis-à-vis silver amounted to around 0.4 per cent per annum.[33]

In the following period 1672-1813 prices are measured in kurantdaler. The period can be divided in two parts. During the first part (1672-1736) price level stability occurred, and there was only a modest depreciation of kurantdaler vis-à-vis silver.[34]

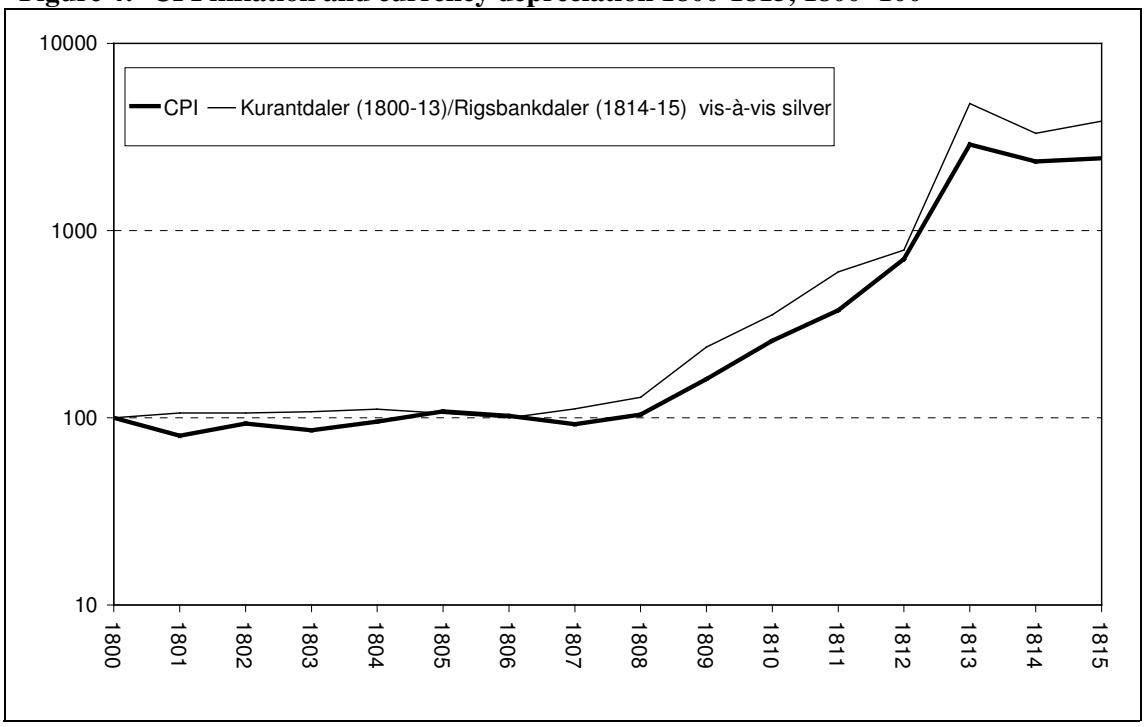
In the second part (1737-1807) the average annual rate of inflation was higher, around 1.4 per cent per annum. The first note-issuing bank within the Danish-Norwegian monarchy, Kurantbanken[35], was established in 1736 and opened for business in 1737. The Kurantbank was not subject to any rules regarding the reserve backing of its bank notes issues, but its notes were redeemable on demand into silver coins. Convertibility of the Kurantbank notes was temporary suspended in 1745-1747 and again in 1757, this time de facto on a permanent basis. From 1760 more than half of the outstanding amounts of loans made by the Kurantbank were claims on the central government and in 1773 the Kurantbank was taken over by the central government. The silver parities implied a par exchange rate of 122.50 rigsdaler kurant per 100 rigsdaler banco[36]. During the period 1737-1782 the Danish exchange rate for Kurantbank notes vis-à-vis Hamburg banco fluctuated between 112 and 132. However from 1782 to 1787 the exchange rate depreciated from 132 to 141, which initiated a reorganisation of the Danish monetary system. The reorganisation was first implemented in the Royal Duchies Schleswig and Holstein. In 1788 the note issuing Schleswig-Holstein Specie Bank was founded as a governmental institution in Altona. It took over the responsibilities of the Kurantbank in the Royal Duchies Schleswig and Holstein whereby Schleswig-Holstein became a separate currency area within the Danish monarchy. The Kurantbank notes continued to depreciate and reached a level of 162 rigsdaler kurant per 100 rigsdaler banco in 1789. Part of the reason was probably that a large amount of the Kurantbank notes withdrawn from the Royal Duchies was not destroyed but re-circulated in Denmark-Norway. A new note-issuing bank for Denmark-Norway, the Danish-Norwegian Specie Bank, was established in Copenhagen in 1791.[37] Its notes and coins were based on the speciedaler whereby the monetary unity within the Danish monarchy was restored. In 1794 the Kurantbank notes returned to par vis-à-vis Hamburger banco.

During the years 1808-1813 Denmark experienced a state of actual hyperinflation with an average inflation around 80 per cent per annum. The background was huge central-

[33] Calculated on the basis of Wilcke (1924).
[34] In the period 1672-1736 the average depreciation of kurantdaler vis-à-vis silver amounted to around 0.3 per cent per annum calculated on the basis of Friis & Glamann (1958) and Wilcke (1929).
[35] The official name of the bank was "Den Kiøbenhavnske Assignation-, Vexel- og Laane-Banqve". The history of the Kurantbank is covered by Rasmussen (1950, 1955).
[36] The Hamburg banco was not a coin but simply a specifically defined amount of fine silver.

government budget deficits due to large war expenditures and lower tax revenue. The budget deficits were financed by the issuing of kurant-denominated bank notes, which caused a massive drop in the silver value of the kurantdaler, cf. figure 4 and section 2.

**Figure 4: CPI inflation and currency depreciation 1800-1815, 1800=100**




Note: Semi-logarithmic scale. Annual averages. An increase in the currency index describes a depreciation vis-à-vis silver.
Source: Page 254 in Wilcke (1929); page 420-424 in Rubow, A. (1918); and annex A.

The price volatility was significantly smaller in the period 1712-1800 than during the preceding periods. A contributing factor is that the price index for the period 1712-1800 is based on a broad range of consumer products and not only corn.

The decades following Napoleonic wars were characterised by deflation. The central bank focused on withdrawing bank notes in order to increase the silver value of the currency, and parity of the rigsbankdaler notes vis-à-vis silver coins was achieved in 1838. The rest of the Silver Standard period (1839-1874) and the Classical Gold Standard period (1875-1913) were dominated by price level stability, cf. table 4.

During the First and Second World War inflation rose to a level significantly higher than the average – although to levels far less than during the Napoleonic wars – whereas the interwar period on average saw a mild deflation.

In a historical perspective the development during the first four decades following the Second World War stands out as an exception with an average inflation rate significant above

[37] At the same time the Kurantbank was closed for new business activities. The circulating amount of Kurantbank notes was not to be increased, and the Kurantbank notes were planned to be gradually withdrawn from circulation

the historical mean even though the country was not in a state of war. The last two decades, inflation has again reached an average around 2 per cent per annum. From table 4 one can also notice that the post-World War II period has only witnessed a few years with a drop in the consumer price level whereas deflation frequently occurred during the preceding four and a half century except in actual war periods.

## 4. Concluding remarks

So far, no Danish CPI has been available for the period prior to 1815. This paper has offered a new consumer price index for Denmark 1502-2007. For the post-1815 period the index is based on existing CPI figures whereas new data has been constructed for the pre-1815 period. For the earliest years 1502-1712 the new CPI covers only the price of corn, whereas the period 1712-1800 is based on the comprehensive price material collected in relation to the Danish Price History Project 1660-1800, which was completed in 2004.

If one define price stability as an inflation rate around 2 per cent per annum, or lower, the past five centuries in Denmark has been dominated by price stability. The average inflation rate in the period 1503-2007 has been 1.7 per cent per annum. Disregarding actual war periods there seems only to have been one major exception from the overall picture of stability: The first four decades after the end of the Second World War where inflation expectations lost their anchor.

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## Annex A: CPI for Denmark 1502-2007

| Year | Index | Annual growth | Year | Index | Annual growth | Year | Index | Annual growth |
|---|---|---|---|---|---|---|---|---|
| | 2000=100 | per cent | | 2000=100 | per cent | | 2000=100 | per cent |
| 1502 | 0.02797 | ... | 1572 | 0.10133 | 16.3 | 1642 | 0.1579 | -4.9 |
| 1503 | 0.02834 | 1.3 | 1573 | 0.09324 | -8.0 | 1643 | 0.1619 | 2.5 |
| 1504 | 0.02872 | 1.3 | 1574 | 0.08309 | -10.9 | 1644 | 0.1644 | 1.6 |
| 1505 | 0.02910 | 1.3 | 1575 | 0.08917 | 7.3 | 1645 | 0.1311 | -20.3 |
| 1506 | 0.02949 | 1.3 | 1576 | 0.08514 | -4.5 | 1646 | 0.1435 | 9.5 |
| 1507 | 0.02989 | 1.3 | 1577 | 0.09324 | 9.5 | 1647 | 0.1343 | -6.4 |
| 1508 | 0.03029 | 1.3 | 1578 | 0.07298 | -21.7 | 1648 | 0.1692 | 26.0 |
| 1509 | 0.03069 | 1.3 | 1579 | 0.08502 | 16.5 | 1649 | 0.2190 | 29.4 |
| 1510 | 0.03110 | 1.3 | 1580 | 0.08911 | 4.8 | 1650 | 0.2199 | 0.4 |
| 1511 | 0.03080 | -1.0 | 1581 | 0.09117 | 2.3 | 1651 | 0.1921 | -12.6 |
| 1512 | 0.03051 | -1.0 | 1582 | 0.09120 | 0.0 | 1652 | 0.2260 | 17.6 |
| 1513 | 0.03022 | -1.0 | 1583 | 0.08532 | -6.5 | 1653 | 0.1368 | -39.5 |
| 1514 | 0.02993 | -1.0 | 1584 | 0.09287 | 8.9 | 1654 | 0.1048 | -23.4 |
| 1515 | 0.02964 | -1.0 | 1585 | 0.08917 | -4.0 | 1655 | 0.1259 | 20.1 |
| 1516 | 0.02936 | -1.0 | 1586 | 0.09931 | 11.4 | 1656 | 0.1544 | 22.7 |
| 1517 | 0.02908 | -1.0 | 1587 | 0.09731 | -2.0 | 1657 | 0.1563 | 1.2 |
| 1518 | 0.02880 | -1.0 | 1588 | 0.08514 | -12.5 | 1658 | 0.1071 | -31.5 |
| 1519 | 0.02853 | -1.0 | 1589 | 0.09731 | 14.3 | 1659 | 0.1453 | 35.7 |
| 1520 | 0.02826 | -1.0 | 1590 | 0.1196 | 22.9 | 1660 | 0.2539 | 74.7 |
| 1521 | 0.02799 | -1.0 | 1591 | 0.1219 | 1.9 | 1661 | 0.3183 | 25.4 |
| 1522 | 0.02772 | -1.0 | 1592 | 0.1240 | 1.8 | 1662 | 0.2467 | -22.5 |
| 1523 | 0.02745 | -1.0 | 1593 | 0.1262 | 1.7 | 1663 | 0.1370 | -44.5 |
| 1524 | 0.02719 | -1.0 | 1594 | 0.1282 | 1.6 | 1664 | 0.1360 | -0.7 |
| 1525 | 0.02693 | -1.0 | 1595 | 0.1302 | 1.5 | 1665 | 0.1528 | 12.4 |
| 1526 | 0.02816 | 4.6 | 1596 | 0.1321 | 1.5 | 1666 | 0.1543 | 0.9 |
| 1527 | 0.02944 | 4.6 | 1597 | 0.1339 | 1.4 | 1667 | 0.1718 | 11.4 |
| 1528 | 0.03078 | 4.6 | 1598 | 0.1357 | 1.3 | 1668 | 0.0970 | -43.6 |
| 1529 | 0.03219 | 4.6 | 1599 | 0.1232 | -9.2 | 1669 | 0.1112 | 14.7 |
| 1530 | 0.03365 | 4.6 | 1600 | 0.1095 | -11.2 | 1670 | 0.1072 | -3.6 |
| 1531 | 0.03519 | 4.6 | 1601 | 0.1359 | 24.2 | 1671 | 0.1276 | 19.0 |
| 1532 | 0.03627 | 3.1 | 1602 | 0.1620 | 19.2 | 1672 | 0.1075 | -15.8 |
| 1533 | 0.03463 | -4.5 | 1603 | 0.1509 | -6.8 | 1673 | 0.0988 | -8.1 |
| 1534 | 0.03306 | -4.5 | 1604 | 0.0985 | -34.7 | 1674 | 0.1781 | 80.3 |
| 1535 | 0.03157 | -4.5 | 1605 | 0.1182 | 19.9 | 1675 | 0.1648 | -7.5 |
| 1536 | 0.03014 | -4.5 | 1606 | 0.0910 | -23.0 | 1676 | 0.1622 | -1.5 |
| 1537 | 0.02878 | -4.5 | 1607 | 0.0937 | 3.0 | 1677 | 0.1639 | 1.1 |
| 1538 | 0.02748 | -4.5 | 1608 | 0.1504 | 60.5 | 1678 | 0.1461 | -10.9 |
| 1539 | 0.02889 | 5.1 | 1609 | 0.1441 | -4.2 | 1679 | 0.1311 | -10.3 |
| 1540 | 0.03302 | 14.3 | 1610 | 0.1410 | -2.1 | 1680 | 0.0981 | -25.2 |
| 1541 | 0.03774 | 14.3 | 1611 | 0.1333 | -5.5 | 1681 | 0.1434 | 46.2 |
| 1542 | 0.04314 | 14.3 | 1612 | 0.1521 | 14.1 | 1682 | 0.1158 | -19.2 |
| 1543 | 0.04931 | 14.3 | 1613 | 0.1354 | -10.9 | 1683 | 0.1181 | 2.0 |
| 1544 | 0.05637 | 14.3 | 1614 | 0.1045 | -22.8 | 1684 | 0.2629 | 122.6 |
| 1545 | 0.06443 | 14.3 | 1615 | 0.1288 | 23.2 | 1685 | 0.1277 | -51.4 |
| 1546 | 0.06754 | 4.8 | 1616 | 0.1248 | -3.1 | 1686 | 0.1127 | -11.8 |
| 1547 | 0.06672 | -1.2 | 1617 | 0.1480 | 18.5 | 1687 | 0.1014 | -10.0 |
| 1548 | 0.06592 | -1.2 | 1618 | 0.1503 | 1.6 | 1688 | 0.1191 | 17.4 |
| 1549 | 0.06512 | -1.2 | 1619 | 0.1366 | -9.1 | 1689 | 0.1268 | 6.5 |
| 1550 | 0.06433 | -1.2 | 1620 | 0.1023 | -25.1 | 1690 | 0.1443 | 13.8 |
| 1551 | 0.06355 | -1.2 | 1621 | 0.1149 | 12.3 | 1691 | 0.1335 | -7.5 |
| 1552 | 0.06278 | -1.2 | 1622 | 0.1575 | 37.1 | 1692 | 0.1423 | 6.6 |
| 1553 | 0.05362 | -14.6 | 1623 | 0.2016 | 28.0 | 1693 | 0.2162 | 52.0 |
| 1554 | 0.05705 | 6.4 | 1624 | 0.2559 | 26.9 | 1694 | 0.1244 | -42.5 |
| 1555 | 0.07902 | 38.5 | 1625 | 0.1688 | -34.0 | 1695 | 0.1375 | 10.5 |
| 1556 | 0.07831 | -0.9 | 1626 | 0.1527 | -9.5 | 1696 | 0.1814 | 31.9 |
| 1557 | 0.07761 | -0.9 | 1627 | 0.1363 | -10.7 | 1697 | 0.2379 | 31.2 |
| 1558 | 0.07691 | -0.9 | 1628 | 0.1875 | 37.5 | 1698 | 0.2582 | 8.5 |
| 1559 | 0.06065 | -21.1 | 1629 | 0.2750 | 46.7 | 1699 | 0.2760 | 6.9 |
| 1560 | 0.05423 | -10.6 | 1630 | 0.2649 | -3.7 | 1700 | 0.1538 | -44.3 |
| 1561 | 0.05816 | 7.2 | 1631 | 0.1971 | -25.6 | 1701 | 0.1458 | -5.2 |
| 1562 | 0.07072 | 21.6 | 1632 | 0.1521 | -22.8 | 1702 | 0.1330 | -8.7 |
| 1563 | 0.07298 | 3.2 | 1633 | 0.1566 | 2.9 | 1703 | 0.1207 | -9.3 |
| 1564 | 0.06846 | -6.2 | 1634 | 0.1624 | 3.7 | 1704 | 0.1605 | 33.0 |
| 1565 | 0.07298 | 6.6 | 1635 | 0.1309 | -19.4 | 1705 | 0.1588 | -1.0 |
| 1566 | 0.09324 | 27.8 | 1636 | 0.1685 | 28.7 | 1706 | 0.1690 | 6.4 |
| 1567 | 0.07691 | -17.5 | 1637 | 0.1700 | 0.9 | 1707 | 0.1368 | -19.1 |
| 1568 | 0.07691 | 0.0 | 1638 | 0.1525 | -10.3 | 1708 | 0.1655 | 20.9 |
| 1569 | 0.08107 | 5.4 | 1639 | 0.1491 | -2.3 | 1709 | 0.3038 | 83.6 |
| 1570 | 0.08514 | 5.0 | 1640 | 0.1607 | 7.8 | 1710 | 0.1757 | -42.2 |
| 1571 | 0.08715 | 2.4 | 1641 | 0.1661 | 3.4 | 1711 | 0.1337 | -23.9 |

| Year | Index | Annual growth | Year | Index | Annual growth | Year | Index | Annual growth |
|---|---|---|---|---|---|---|---|---|
| | 2000=100 | per cent | | 2000=100 | per cent | | 2000=100 | per cent |
| 1712 | 0.1455 | 8.8 | 1782 | 0.2453 | 20.1 | 1852 | 1.818 | 0.0 |
| 1713 | 0.1354 | -6.9 | 1783 | 0.2372 | -3.3 | 1853 | 2.009 | 10.5 |
| 1714 | 0.1492 | 10.2 | 1784 | 0.2374 | 0.1 | 1854 | 2.220 | 10.5 |
| 1715 | 0.1441 | -3.4 | 1785 | 0.2398 | 1.0 | 1855 | 2.262 | 1.9 |
| 1716 | 0.1482 | 2.8 | 1786 | 0.2358 | -1.7 | 1856 | 2.368 | 4.7 |
| 1717 | 0.1552 | 4.7 | 1787 | 0.2476 | 5.0 | 1857 | 2.326 | -1.8 |
| 1718 | 0.1526 | -1.7 | 1788 | 0.2357 | -4.8 | 1858 | 2.114 | -9.1 |
| 1719 | 0.1472 | -3.6 | 1789 | 0.2440 | 3.5 | 1859 | 2.072 | -2.0 |
| 1720 | 0.1585 | 7.7 | 1790 | 0.2608 | 6.9 | 1860 | 2.114 | 2.0 |
| 1721 | 0.1427 | -9.9 | 1791 | 0.2444 | -6.3 | 1861 | 2.199 | 4.0 |
| 1722 | 0.1286 | -9.9 | 1792 | 0.2509 | 2.7 | 1862 | 2.178 | -1.0 |
| 1723 | 0.1233 | -4.1 | 1793 | 0.2626 | 4.7 | 1863 | 2.114 | -2.9 |
| 1724 | 0.1188 | -3.6 | 1794 | 0.2612 | -0.5 | 1864 | 2.136 | 1.0 |
| 1725 | 0.1147 | -3.4 | 1795 | 0.2653 | 1.6 | 1865 | 2.178 | 2.0 |
| 1726 | 0.1074 | -6.4 | 1796 | 0.2977 | 12.2 | 1866 | 2.241 | 2.9 |
| 1727 | 0.1133 | 5.5 | 1797 | 0.2869 | -3.6 | 1867 | 2.347 | 4.7 |
| 1728 | 0.1259 | 11.1 | 1798 | 0.2887 | 0.6 | 1868 | 2.326 | -0.9 |
| 1729 | 0.1340 | 6.4 | 1799 | 0.2887 | 0.0 | 1869 | 2.178 | -6.4 |
| 1730 | 0.1290 | -3.7 | 1800 | 0.3177 | 10.1 | 1870 | 2.114 | -2.9 |
| 1731 | 0.1253 | -2.8 | 1801 | 0.2545 | -19.9 | 1871 | 2.114 | 0.0 |
| 1732 | 0.1249 | -0.3 | 1802 | 0.2962 | 16.4 | 1872 | 2.049 | -3.1 |
| 1733 | 0.1155 | -7.6 | 1803 | 0.2720 | -8.2 | 1873 | 2.099 | 2.5 |
| 1734 | 0.1107 | -4.2 | 1804 | 0.3033 | 11.5 | 1874 | 2.122 | 1.1 |
| 1735 | 0.1115 | 0.8 | 1805 | 0.3436 | 13.3 | 1875 | 2.172 | 2.4 |
| 1736 | 0.1114 | -0.1 | 1806 | 0.3250 | -5.4 | 1876 | 2.194 | 1.0 |
| 1737 | 0.1095 | -1.7 | 1807 | 0.2937 | -9.6 | 1877 | 2.220 | 1.1 |
| 1738 | 0.1097 | 0.2 | 1808 | 0.3305 | 12.5 | 1878 | 2.217 | -0.1 |
| 1739 | 0.1037 | -5.4 | 1809 | 0.5123 | 55.0 | 1879 | 2.192 | -1.1 |
| 1740 | 0.1085 | 4.6 | 1810 | 0.8205 | 60.2 | 1880 | 2.164 | -1.3 |
| 1741 | 0.1173 | 8.2 | 1811 | 1.194 | 45.6 | 1881 | 2.187 | 1.0 |
| 1742 | 0.1136 | -3.2 | 1812 | 2.231 | 86.8 | 1882 | 2.184 | -0.1 |
| 1743 | 0.1106 | -2.6 | 1813 | 9.174 | 311.2 | 1883 | 2.181 | -0.1 |
| 1744 | 0.1167 | 5.6 | 1814 | 7.416 | -19.2 | 1884 | 2.106 | -3.5 |
| 1745 | 0.1247 | 6.9 | 1815 | 7.739 | 4.4 | 1885 | 2.053 | -2.5 |
| 1746 | 0.1356 | 8.7 | 1816 | 7.739 | 0.0 | 1886 | 1.975 | -3.8 |
| 1747 | 0.1305 | -3.7 | 1817 | 6.935 | -10.4 | 1887 | 1.896 | -4.0 |
| 1748 | 0.1249 | -4.3 | 1818 | 4.335 | -37.5 | 1888 | 1.869 | -1.5 |
| 1749 | 0.1228 | -1.7 | 1819 | 3.193 | -26.3 | 1889 | 1.891 | 1.2 |
| 1750 | 0.1233 | 0.4 | 1820 | 2.876 | -9.9 | 1890 | 1.914 | 1.2 |
| 1751 | 0.1126 | -8.6 | 1821 | 2.411 | -16.2 | 1891 | 1.986 | 3.8 |
| 1752 | 0.1165 | 3.4 | 1822 | 2.072 | -14.0 | 1892 | 2.009 | 1.1 |
| 1753 | 0.1087 | -6.6 | 1823 | 2.220 | 7.1 | 1893 | 1.979 | -1.5 |
| 1754 | 0.1250 | 15.0 | 1824 | 1.903 | -14.3 | 1894 | 1.923 | -2.8 |
| 1755 | 0.1251 | 0.1 | 1825 | 1.945 | 2.2 | 1895 | 1.842 | -4.2 |
| 1756 | 0.1291 | 3.2 | 1826 | 1.882 | -3.3 | 1896 | 1.786 | -3.0 |
| 1757 | 0.1471 | 13.9 | 1827 | 1.988 | 5.6 | 1897 | 1.781 | -0.3 |
| 1758 | 0.1573 | 6.9 | 1828 | 1.840 | -7.4 | 1898 | 1.801 | 1.1 |
| 1759 | 0.1381 | -12.2 | 1829 | 1.903 | 3.4 | 1899 | 1.843 | 2.4 |
| 1760 | 0.1356 | -1.8 | 1830 | 1.924 | 1.1 | 1900 | 1.889 | 2.4 |
| 1761 | 0.1371 | 1.1 | 1831 | 2.009 | 4.4 | 1901 | 1.886 | -0.1 |
| 1762 | 0.1462 | 6.6 | 1832 | 1.924 | -4.2 | 1902 | 1.911 | 1.3 |
| 1763 | 0.1721 | 17.7 | 1833 | 1.776 | -7.7 | 1903 | 1.908 | -0.1 |
| 1764 | 0.1702 | -1.1 | 1834 | 1.692 | -4.8 | 1904 | 1.934 | 1.3 |
| 1765 | 0.1831 | 7.5 | 1835 | 1.755 | 3.8 | 1905 | 1.926 | -0.4 |
| 1766 | 0.1707 | -6.8 | 1836 | 1.840 | 4.8 | 1906 | 1.940 | 0.8 |
| 1767 | 0.1736 | 1.7 | 1837 | 1.797 | -2.3 | 1907 | 2.008 | 3.5 |
| 1768 | 0.1826 | 5.2 | 1838 | 1.818 | 1.2 | 1908 | 2.029 | 1.1 |
| 1769 | 0.1767 | -3.2 | 1839 | 1.861 | 2.3 | 1909 | 2.044 | 0.7 |
| 1770 | 0.1792 | 1.4 | 1840 | 1.840 | -1.1 | 1910 | 2.058 | 0.7 |
| 1771 | 0.1863 | 4.0 | 1841 | 1.797 | -2.3 | 1911 | 2.065 | 0.3 |
| 1772 | 0.1950 | 4.7 | 1842 | 1.861 | 3.5 | 1912 | 2.145 | 3.9 |
| 1773 | 0.1893 | -2.9 | 1843 | 1.734 | -6.8 | 1913 | 2.202 | 2.7 |
| 1774 | 0.1686 | -11.0 | 1844 | 1.692 | -2.4 | 1914 | 2.253 | 2.4 |
| 1775 | 0.1727 | 2.4 | 1845 | 1.755 | 3.8 | 1915 | 2.659 | 18.0 |
| 1776 | 0.1643 | -4.9 | 1846 | 1.988 | 13.3 | 1916 | 3.132 | 17.8 |
| 1777 | 0.1814 | 10.4 | 1847 | 2.114 | 6.4 | 1917 | 3.627 | 15.8 |
| 1778 | 0.1714 | -5.5 | 1848 | 1.882 | -11.0 | 1918 | 4.236 | 16.8 |
| 1779 | 0.1973 | 15.1 | 1849 | 1.797 | -4.5 | 1919 | 5.024 | 18.6 |
| 1780 | 0.1954 | -1.0 | 1850 | 1.776 | -1.2 | 1920 | 5.994 | 19.3 |
| 1781 | 0.2042 | 4.5 | 1851 | 1.818 | 2.4 | 1921 | 5.095 | -15.0 |

| Year | Index | Annual growth | Year | Index | Annual growth |
|---|---|---|---|---|---|
| | 2000=100 | per cent | | 2000=100 | per cent |
| 1922 | 4.331 | -15.0 | 1992 | 84.61 | 2.1 |
| 1923 | 4.513 | 4.2 | 1993 | 85.71 | 1.3 |
| 1924 | 4.783 | 6.0 | 1994 | 87.42 | 2.0 |
| 1925 | 4.650 | -2.8 | 1995 | 89.26 | 2.1 |
| 1926 | 3.952 | -15.0 | 1996 | 91.13 | 2.1 |
| 1927 | 3.818 | -3.4 | 1997 | 93.14 | 2.2 |
| 1928 | 3.795 | -0.6 | 1998 | 94.81 | 1.8 |
| 1929 | 3.772 | -0.6 | 1999 | 97.18 | 2.5 |
| 1930 | 3.591 | -4.8 | 2000 | 100.0 | 2.9 |
| 1931 | 3.386 | -5.7 | 2001 | 102.4 | 2.4 |
| 1932 | 3.363 | -0.7 | 2002 | 104.9 | 2.4 |
| 1933 | 3.453 | 2.7 | 2003 | 107.1 | 2.1 |
| 1934 | 3.588 | 3.9 | 2004 | 108.3 | 1.2 |
| 1935 | 3.724 | 3.8 | 2005 | 110.3 | 1.8 |
| 1936 | 3.769 | 1.2 | 2006 | 112.4 | 1.9 |
| 1937 | 3.905 | 3.6 | 2007 | 114.3 | 1.7 |
| 1938 | 3.952 | 1.2 | | | |
| 1939 | 4.066 | 2.9 | | | |
| 1940 | 5.058 | 24.4 | | | |
| 1941 | 5.802 | 14.7 | | | |
| 1942 | 6.005 | 3.5 | | | |
| 1943 | 6.053 | 0.8 | | | |
| 1944 | 6.186 | 2.2 | | | |
| 1945 | 6.254 | 1.1 | | | |
| 1946 | 6.211 | -0.7 | | | |
| 1947 | 6.391 | 2.9 | | | |
| 1948 | 6.550 | 2.5 | | | |
| 1949 | 6.708 | 2.4 | | | |
| 1950 | 7.318 | 9.1 | | | |
| 1951 | 8.174 | 11.7 | | | |
| 1952 | 8.354 | 2.2 | | | |
| 1953 | 8.312 | -0.5 | | | |
| 1954 | 8.470 | 1.9 | | | |
| 1955 | 9.038 | 6.7 | | | |
| 1956 | 9.490 | 5.0 | | | |
| 1957 | 9.604 | 1.2 | | | |
| 1958 | 9.690 | 0.9 | | | |
| 1959 | 9.893 | 2.1 | | | |
| 1960 | 10.12 | 2.3 | | | |
| 1961 | 10.58 | 4.5 | | | |
| 1962 | 11.27 | 6.6 | | | |
| 1963 | 11.86 | 5.2 | | | |
| 1964 | 12.29 | 3.6 | | | |
| 1965 | 13.07 | 6.4 | | | |
| 1966 | 13.96 | 6.8 | | | |
| 1967 | 15.00 | 7.4 | | | |
| 1968 | 16.20 | 8.0 | | | |
| 1969 | 16.76 | 3.5 | | | |
| 1970 | 17.85 | 6.5 | | | |
| 1971 | 18.91 | 5.9 | | | |
| 1972 | 20.15 | 6.6 | | | |
| 1973 | 22.03 | 9.3 | | | |
| 1974 | 25.40 | 15.3 | | | |
| 1975 | 27.84 | 9.6 | | | |
| 1976 | 30.34 | 9.0 | | | |
| 1977 | 33.71 | 11.1 | | | |
| 1978 | 37.08 | 10.0 | | | |
| 1979 | 40.64 | 9.6 | | | |
| 1980 | 45.64 | 12.3 | | | |
| 1981 | 50.98 | 11.7 | | | |
| 1982 | 56.13 | 10.1 | | | |
| 1983 | 60.00 | 6.9 | | | |
| 1984 | 63.78 | 6.3 | | | |
| 1985 | 66.78 | 4.7 | | | |
| 1986 | 69.25 | 3.7 | | | |
| 1987 | 72.02 | 4.0 | | | |
| 1988 | 75.26 | 4.5 | | | |
| 1989 | 78.87 | 4.8 | | | |
| 1990 | 80.92 | 2.6 | | | |
| 1991 | 82.87 | 2.4 | | | |