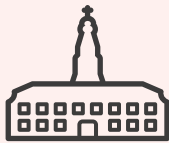


# DANMARKS NATIONALBANK

12 OCTOBER 2021 — NO. 25

## Danmarks Nationalbank's gold – a historical overview



### Danmarks Nationalbank has gold for historical reasons

In the past, gold was an important part of the foreign exchange reserve. Today, it represents only a small part of it.

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### The gold stock consists mostly of gold bars

The gold bars can be sold or borrowed against in the international gold market if foreign exchange needs to be raised to defend the krone exchange rate.

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### Most of the gold is stored at foreign central banks

The bulk of the gold is stored securely at Bank of England, and there is also a small amount in the USA at the Federal Reserve Bank of New York. The rest is in Denmark.

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Under the Danmarks Nationalbank Act (*Nationalbankloven*), Danmarks Nationalbank must hold a stock of gold. At the end of 2020, the stock of gold was approximately 66.5 tonnes with a market value of kr. 24.5 billion.

Gold used to play an important role in both the cash system and more generally in monetary and foreign exchange policies. But that was many years ago, and by the end of 2020 gold accounted for only a small proportion (5.6 per cent) of the value of Danmarks Nationalbank's foreign exchange reserve.<sup>1</sup> Today, the foreign exchange reserve consists primarily of deposits in foreign banks and of bonds in euro, which can be quickly sold or borrowed against if foreign exchange needs to be raised to defend the krone exchange rate.

Many other central banks have a gold stock for historical reasons, like Danmarks Nationalbank. At the end of 2020, Danmarks Nationalbank's gold stock accounted for only 0.2 per cent of the total global gold stock of around 35,000 tonnes held by central banks and other monetary authorities. It is estimated that by the end of 2019, central banks owned 18 per cent of the total amount of gold mined worldwide of around 197,600 tonnes.<sup>2</sup>

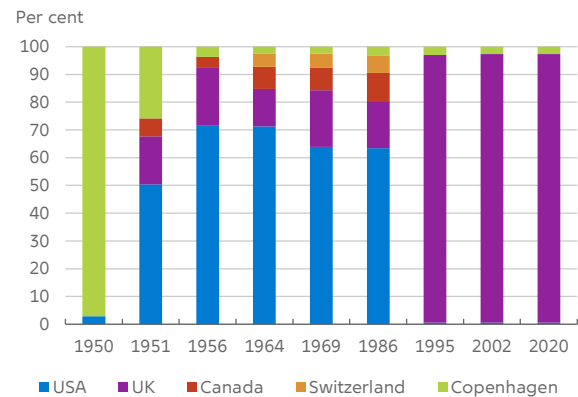
Today, Danmarks Nationalbank's gold stock consists primarily of about 5,200 gold bars, stored securely at two foreign central banks, the Bank of England and the Federal Reserve Bank of New York. Since the early 1950s, most of Danmarks Nationalbank's gold stock has been stored abroad, see chart 1.

This analysis looks into the following issues:

- The historical background to Danmarks Nationalbank's gold stock and the role of gold in the international monetary regimes in which Denmark has participated
- The provisions on gold in the Danmarks Nationalbank Act
- The contents of the gold stock, its development in size and its geographical location over time
- Issues relating to accounting, control and auditing of the gold stock.

**Geographical location of Danmarks Nationalbank's gold stock**

Chart 1



Note: Year-end except 1951 (March), 1956 (September) and 1969 (June). USA: Federal Reserve Bank of New York (including gold deposits at the Bank for International Settlements (BIS) with location New York). United Kingdom: Bank of England (including gold deposits at the BIS with location London). Canada: Bank of Canada. Switzerland: Schweizerische Nationalbank. For 1950, 1951 and 1969, a modest amount of gold stored at the International Monetary Fund (IMF) is attributed to the USA.

Source: Danmarks Nationalbank's document archive at the Danish National Archives and internal material at Danmarks Nationalbank.

The information in the analysis comes from publications, historical source material from Danmarks Nationalbank's document archive at the Danish National Archives and internal material at Danmarks Nationalbank. Like other companies, Danmarks Nationalbank has only kept background material for, among other things, annual accounts for a certain number of years back in time. Certain historical information on the gold stock can therefore only be found in Danmarks Nationalbank's archives if such information relates to other Danmarks Nationalbank business areas, and material from these has been considered relevant to preserve.

<sup>1</sup> See Danmarks Nationalbank, *Annual Report 2020*.

<sup>2</sup> See IMF, *International Financial Statistics* and the page "How much gold has been mined?" on the World Gold Council's website ([link](#)).

## The gold standard

Under the classical gold standard in the late 19th and early 20th centuries, many countries based their monetary systems on gold. This meant that the coins had a certain gold content and that banknotes could be freely exchanged for gold coins at the central bank according to an officially established conversion ratio (a gold coin standard).<sup>3</sup>

Denmark switched from a silver-based to a gold-based monetary system with the Coinage Act (*Møntloven*) of 1873, which also meant a transition from rigsdaler to kroner as a currency unit. The new krone coins had a certain gold content, and banknotes denominated in kroner could be exchanged freely for gold coins at Danmarks Nationalbank. Thus, as a result of the new monetary system, the majority of Danmarks Nationalbank's foreign exchange reserve then consisted of gold (or claims linked to gold), compared to silver previously.<sup>4</sup>

The classical gold standard ensured fixed exchange rates between the participating countries, see box 1. This was not a system coordinated by an international organisation or the like. A country usually joined the gold standard by committing itself to issuing banknotes that were freely convertible to gold, while allowing the free movement of gold and capital across national borders. The Scandinavian countries were among those that deviated from the pattern of joining the gold standard unilaterally. In the first half of the 1870s, Norway, Sweden and Denmark concluded agreements on a Scandinavian currency union. The agreements covered common standards for the gold content of the countries' main coins, and from the mid-1870s a Danish, a Swedish and a Norwegian krone coin had the same gold

### How the gold standard led to fixed exchange rates

Box 1

The gold standard ensured fixed exchange rates between the participating countries. In 1875, for example, Danish krone coins contained 0.4032 g fine gold, while a British pound coin contained 7.3224 g fine gold. This gave a value ratio between the two countries' coins of  $7.3224/0.4032 = \text{kr. } 18.16$  per pound. The exchange rate between the krone and the pound fluctuated closely around this ratio – the so-called mint parity. The exchange rate was not always in full accord with the mint parity, but this was due to the costs of minting, insurance and transport of the gold. If the exchange rate deviated too much from the mint parity, it would be profitable to buy the cheaper of the two currencies, have it melted down and minted as the more expensive of the two currencies.

content. These gold coins could circulate freely in the three countries as legal tender.

As part of the rules of the game of the gold standard<sup>5</sup>, the standard could be temporarily suspended in case of an emergency, but a return to it afterwards would have to be ensured.

The international gold standard system was suspended at the outbreak of World War I in 1914, and Danmarks Nationalbank was also exempted from the obligation to convert its banknotes into gold coins. In 1927, Denmark returned to the gold standard with the same gold content in a krone as in 1913. However, Danmarks Nationalbank was only obliged to exchange banknotes for amounts of gold equal

3 The gold standard has previously been described in several Danmarks Nationalbank publications, including Bie, Ulrik and Astrid Henneberg Pedersen (1999), *The Role of Gold in the Monetary System*, *Danmarks Nationalbank Monetary Review*, Vol. 38(3), pp. 19-35; Abildgren, Kim (2004), *A chronology of Denmark's exchange-rate policy 1875-2003*, *Danmarks Nationalbank Working Papers*, No. 12, April; and Abildgren, Kim (2018), *Danmarks Nationalbank 1818-2018*, Rosendahls.

4 See Abildgren, Kim (2016), *175 years of financial risks and returns in central banking*, *Danmarks Nationalbank Working Papers*, No. 103, January.

5 See, for example, McKinnon, Ronald I. (1993), *The Rules of the Game: International Money in Historical Perspectives*, *Journal of Economic Literature*, Vol. 31(1), pp. 1-44; Bordo, Michael D. and Finn E. Kydland (1995), *The Gold Standard As a Rule: An Essay in Exploration*, *Explorations in Economic History*, Vol. 32(4), pp. 423-464; and Bordo, Michael D. and Hugh Rockoff (1996), *The Gold Standard as a "Good House-keeping Seal of Approval"*, *Journal of Economic History*, Vol. 56(2), pp. 389-428.

to the value of one or more whole gold bars (a gold bar standard).<sup>6</sup>

During the economic crisis of the early 1930s, the international gold standard system collapsed. The UK left the gold standard in September 1931. Denmark did the same shortly after, and Danmarks Nationalbank's obligation to convert its issued banknotes into gold was lifted. Since then, gold has played no role in Denmark's banknote system.

## Gold and the Bretton Woods system

The International Monetary Fund (IMF) was founded in 1944, and one of its tasks was to administer the new international exchange rate system established after World War II. It was named the Bretton Woods system after the city where the agreement was concluded. The Bretton Woods system was a fixed exchange rate system aimed at avoiding the competing devaluations that had characterised crisis policy in the 1930s. In the Bretton Woods system, the participating countries maintained a fixed exchange rate against the dollar within a narrow fluctuation band. The dollar was, in turn, defined against gold, but only central banks and similar monetary authorities could convert dollars into gold at the US Treasury at the official parity (35 dollars per ounce of gold<sup>7</sup>).

Denmark joined the IMF in 1946 and also became part of the Bretton Woods system. This obliged the Danish state to pay a certain amount of gold to the

IMF as part of Denmark's quota in the IMF's capital base.<sup>8</sup>

In the decades after World War II, the focus was also on lifting the quantitative trade restrictions and bilateral payment agreements that had characterised the international economy in the 1930s and in the war years. Gold played a role as a payment instrument in the European Payment Union (EPU), established in 1950 as a multilateral payment and credit system for settling trade imbalances between a number of Western European countries (including Denmark). The EPU existed until 1958, when most EPU countries (including Denmark) made their currencies convertible again, i.e. freely exchangeable with other currencies, including the dollar.<sup>9</sup>

The Bretton Woods system came under growing pressure during the 1960s, when the amount of short-term dollar claims grew relative to the US gold reserves. Major differences emerged between the price of gold in the private market and the official parity, and efforts to eliminate them failed, despite several central banks' coordinated interventions in the gold market. The Bretton Woods system collapsed in the early 1970s, when the USA lifted the gold convertibility of the dollar. This meant a gradual transition to floating exchange rates between the main currencies and an end to the key role of gold in the international monetary system.

In the second half of the 1970s, the requirement that 25 per cent of an IMF member country's quota should be paid in gold was abolished. In addition, it was decided in 1976 that part of the IMF's gold stock should be sold back to the member countries at the official book price, which was significantly lower than the market price.<sup>10</sup>

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6 This was in line with the recommendations of the international conference on resuming the gold standard held in Genoa in 1922. The idea was that a gold bar standard would reduce the need for monetary gold compared to a gold coin standard. For the same reason, one of the recommendations of the Genoa Conference was that central banks in small countries should keep larger parts of their reserves in currencies that could be converted into gold, rather than including gold directly in the foreign exchange reserve (a gold exchange standard). The gold-saving recommendations of the Genoa Conference aimed to prevent future income increases, combined with limited global gold production, from generating liquidity shortage in the international monetary system.

7 Gold amounts are traditionally measured in troy ounces. 1 troy ounce is defined as 31.1034768 g fine gold. 1 kg fine gold is approximately equivalent to 32.1507465 troy ounces, see the page "The Troy Ounce" on the London Bullion Market Association's website ([link](#)).

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8 See Danmarks Nationalbank, *Report and Accounts 1946*; and Danmarks Nationalbank, *Report and Accounts 1949*.

9 See Mikkelsen, Richard (1999), *Marshall Help. European Payment Union* (in Danish only), Danmarks Nationalbank.

10 Another part of the IMF's gold stock was to be sold at auction, and the realised capital gain was to be used for the benefit of developing countries, see Mogensen, Katrine Graabæk (2007), *The Future Financing of the IMF, Danmarks Nationalbank Monetary Review*, Vol. 46(2), pp. 81-92; Andersen, Bodil Nyboe and Henning Holten (1978), *Developments in the international monetary system since 1945* (in Danish only), *Nationaløkonomisk Tidsskrift*, Vol. 116, pp. 6-22; and Danmarks Nationalbank, *Report and Accounts 1976*.

After the 1970s, gold was still included in the foreign exchange reserves of many central banks – and was for example used for certain transactions between central banks in the European exchange rate cooperation (see below) – but gold's share of the reserves decreased over time.

## Gold and the European exchange rate cooperation

Gold was originally among the currency assets that could be used to settle intervention credits in the European exchange rate cooperation, which was established in the early 1970s, named the "Currency Snake". The Danish krone also participated in this cooperation. However, the settlement followed a gold price significantly below the market price for gold, which made member states unwilling to use gold for the repayment of intervention credit. In the mid-1970s, gold was thus removed from the pool of currencies for the settlement of intervention credits.<sup>11</sup>

In 1979, the European exchange rate cooperation EMS/ERM was established, making it mandatory for the participating national central banks – including Danmarks Nationalbank – to deposit 20 per cent

of their gold stock and 20 per cent of their dollar reserves in the European Monetary Cooperation Fund (EMCF). In return, the central banks received a claim in ecu<sup>12</sup> on the EMCF, which could be used to settle intervention credits within the exchange rate cooperation.<sup>13</sup> Gold deposits were adjusted quarterly (through rolling spot and forward transactions) to continuously correspond to 20 per cent of gold stocks. Ownership of the gold remained with the depositing central banks.

In 1994, the European Monetary Institute (EMI) took over the tasks previously performed by the EMCF, including the task of issuing claims in ecu on the basis of gold deposits.<sup>14</sup> When the European Central Bank (ECB) was established in mid-1998, it took over the administration of the depositing scheme. The scheme was phased out at the end of the year, when the EMS/ERM was replaced by the ERM2 and the euro was introduced.<sup>15</sup>

When the euro was introduced at the beginning of 1999, the participating national central banks were to transfer part of their foreign exchange reserves to the ECB.<sup>16</sup> 15 per cent of the transfers were made up of gold<sup>17</sup>, and gold has been transferred from the national central banks to the ECB in all euro area enlargements since 1999 as part of foreign exchange reserve transfers<sup>18</sup>. If Denmark had chosen to join the

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11 See Hoffmeyer, Erik (1992), *The International Monetary System: An Essay in Interpretation*, Amsterdam: North-Holland.

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12 European Currency Unit. The ecu was a basket of currencies composed of fixed quantities of all European Community member states' currencies.

13 See Danmarks Nationalbank, *Report and Accounts 1979*.

14 See EMI, *Annual Report 1994*.

15 See ECB, *Annual Report 1998*.

16 In accordance with Article 30 of the Statute of the ESCB (Protocol on the Statute of the European System of Central Banks and of the European Central Bank), the amount of transfers by each central bank should be based on the key for the payment of capital to the ECB. The Statute of the ESCB did not specify a transfer currency, but a Guideline of the ECB of 3 November 1998 laid down the currencies as dollar, yen and gold, see Guideline of the European Central Bank of 3 November 1998 as amended by the Guideline of 16 November 2000 on the composition, valuation and modalities for the initial transfer of foreign-reserve assets, and the denomination and remuneration of equivalent claims (ECB/2000/15).

17 See ECB, *Annual Report 1998*; and ECB, *Annual Report 1999*.

18 Greece in 2001, Slovenia in 2007, Cyprus and Malta in 2008, Slovakia in 2009, Estonia in 2011, Latvia in 2014 and Lithuania in 2015, see ECB, *Annual Report 2001*; ECB, *Annual Report 2007*; ECB, *Annual Report 2008*; ECB, *Annual Report 2009*; ECB, *Annual Report 2011*; ECB, *Annual Accounts 2014*; and ECB, *Annual Accounts 2015*.

euro in the referendum in September 2000, Danmarks Nationalbank would also have been obliged to transfer gold to the ECB.<sup>19</sup>

## Agreement between European central banks on gold sales 1999-2019

In the late 1980s and in the 1990s, a number of central banks sold gold from their stocks, while others announced plans to do so.<sup>20</sup> This put downward pressure on gold prices and led to uncertainty in the gold market, given the central banks' large gold stocks. In order to create transparency and dampen uncertainty, the ECB and 14 other European central banks<sup>21</sup> announced an agreement in 1999 to coordinate their plans for the sale of gold from their foreign exchange reserves.<sup>22</sup> Danmarks Nationalbank was not party to the agreement.

The agreement on coordination of sales plans was renewed in 2004, 2009 and 2014. The parties to the 2014 agreement were the ECB and 21 other central banks<sup>23</sup> – and it expired in 2019. Upon expiry, the parties announced that they no longer saw a need

for the agreement as the gold market had matured significantly since 1999. At the same time, the parties to the agreement confirmed that they still considered gold to be an important foreign exchange reserve asset. Furthermore, it was mentioned that none of them had current plans to sell considerable amounts of gold and that central banks and other official institutions had by then generally become net buyers of gold.

A recent analysis by the ECB<sup>24</sup> confirms that central banks and other official institutions have become net buyers of gold over the past decade. This is primarily due to institutions in emerging market economies. The development is said to reflect the low or negative nominal interest rates and diversification gains of holding gold through portfolio diversification. The gain may occur if the gold price tends to diverge from the price of other assets, such as equities and bonds, including if gold is perceived as a safe haven during periods of financial market volatility.<sup>25</sup> In various previous studies, Danmarks Nationalbank has discussed the diversification gains from holding gold in its foreign exchange reserve through market risk diversification on the portfolio.<sup>26</sup>

19 See Bie, Ulrik and Astrid Henneberg Pedersen (1999), The Role of Gold in the Monetary System, *Danmarks Nationalbank Monetary Review*, Vol. 38(3), pp. 19-35; Kjeldsen, Kristian (2000), ECB Ownership and Reserves (in Danish only), *Danmarks Nationalbank Monetary Review*, Vol. 39(1), pp. 57-64; and Ministry of Economic Affairs and Finance (2000), *Denmark and the euro* (in Danish only), Schultz.

20 See Bie, Ulrik and Astrid Henneberg Pedersen (1999), The Role of Gold in the Monetary System, *Danmarks Nationalbank Monetary Review*, Vol. 38(3), pp. 19-35.

21 Oesterreichische Nationalbank, Banque Nationale de Belgique, Finlands Bank, Banque de France, Deutsche Bundesbank, Central Bank of Ireland, Banca d'Italia, Banque centrale du Luxembourg, De Nederlandsche Bank, Banco de Portugal, Banco de España, Sveriges Riksbank, Schweizerische Nationalbank and the Bank of England, see the press release *Joint statement on gold* from the ECB, 26 September 1999.

22 See also Danmarks Nationalbank, *Monetary Review*, 4th Quarter 1999.

23 Banque Nationale de Belgique, Deutsche Bundesbank, Eesti Pank, Central Bank of Ireland, Bank of Greece, Banco de España, Banque de France, Banca d'Italia, Central Bank of Cyprus, Latvijas Banka, Lietuvos bankas, Banque centrale du Luxembourg, Central Bank of Malta, De Nederlandsche Bank, Oesterreichische Nationalbank, Banco de Portugal, Banka Slovenije, Národná banka Slovenska, Finlands Bank, Sveriges Riksbank and Swiss National Bank, see the press release *As market matures central banks conclude that a formal gold agreement is no longer necessary* from the ECB, 26 July 2019.

24 Chițu, Livia, Joaquim Gomes and Rolf Pauli (2019), Trends in central banks' foreign currency reserves and the case of the ECB, *ECB Economic Bulletin*, Issue 7, pp. 39-59.

25 See Jensen, Thomas Krabbe and Christian Stampe Sørensen (2010), The Increase in the Price of Gold in Recent Years, *Danmarks Nationalbank Monetary Review*, Vol. 49(1), pp. 51-64.

26 See Hansen, Ib and Christian Ølgaard (2000), Danmarks Nationalbank's Risk Management, *Danmarks Nationalbank Monetary Review*, Vol. 39(2), pp. 103-117; and Danmarks Nationalbank (2003), *Financial Management at Danmarks Nationalbank*.

## Gold and the Danmarks Nationalbank Act

When the Danmarks Nationalbank Act was drafted in the early 1930s, it was still expected that Denmark would return to the gold standard. That is why the Danmarks Nationalbank Act of 1936 stated that Danmarks Nationalbank should have a gold fund, and the banknotes in the 1936 series still showed the printed text “Danmarks Nationalbank’s banknotes can be converted to gold in accordance with legislation in force”.<sup>27</sup>

Section 10 of the Danmarks Nationalbank Act states that Danmarks Nationalbank must possess a gold fund as collateral for banknotes issued, and it must cover at least 25 per cent of the total active note circulation, see box 2. Under section 13 of the Act, the Board of Directors may, after having obtained the permission of the Royal Bank Commissioner (the Minister for Industry, Business and Financial Affairs), grant permission to deviate from the requirement for gold coverage of banknotes in circulation. The derogation has been granted since September 1939<sup>28</sup>, and is a regular item on the agenda of the quarterly meetings of Danmarks Nationalbank’s Board of Directors.

Nowadays, the provisions on gold coverage for Danmarks Nationalbank’s banknotes are of historical interest only.<sup>29</sup> The longstanding practice of derogation from the requirement for gold convertibility for banknotes in circulation has worked smoothly. In terms of Danmarks Nationalbank’s objective of contributing to stable prices, safe payments and stability in the financial system, increasing the gold stock or reducing banknote circulation, citing banknote coverage provisions, has not yet been relevant.

The last actual transactions in Danmarks Nationalbank’s gold stock took place in the late 1970s. However, as mentioned above, the gold stock played a role in the European exchange rate cooperation EMS/ERM up to 1999, to which the Danish fixed

### Excerpts from Act no. 116 of 7 April 1936 on the National Bank of Denmark Box 2

Excerpts from section 10:

“The gold fund shall cover at least 25 per centum of the total active note circulation. It may consist of:

- a. Gold, be it in coin or ingots, either in the custody of the Bank or handed over by the Bank to the Royal Mint to be coined or melted.
- b. Gold, which properly secured has been deposited abroad or which is in transit through, to or from foreign countries. Provided that such gold shall not count when the Bank’s right to dispose thereof is restricted. The gold under this subsection shall not exceed 5% of the total active note circulation.

For up to 5 per centum of the note circulation non-interest carrying net-credit-balances on demand with foreign Central Banks, approved of in that respect by the Royal Bank Commissioner, may take the place of gold.”

Reproduction of section 13:

“Under special circumstances the Board of Directors shall, after having obtained the permission of the Minister of Trade, Industry and Shipping, for a period of up to 3 months at a time be allowed to deviate from the funding rules prescribed. A decision to this effect shall be adopted by at least 2/3 of all the members of the Board of Directors. It shall be the duty of the Bank as soon as possible to re-establish the normal funding proportion.”

27 See Abildgren, Kim (2018), *Danmarks Nationalbank 1818-2018*, Rosendahls.

28 See Danmarks Nationalbank, *Report and Accounts 2006*.

29 See Christensen, Bent (1985), *Danmarks Nationalbank and administrative law* (in Danish only), Jurist- og Økonomforbundets Forlag.

exchange rate policy was anchored, and if Denmark had chosen to join the euro in the 2000 referendum, Danmarks Nationalbank would have been obliged to transfer gold to the ECB. But then the gold became a “fixed asset” in the foreign exchange reserve, not actively managed in terms of investment, but kept largely constant in physical quantities.<sup>30</sup>

The tradition of using gold as a foreign exchange reserve asset goes back a long time, and, like Danmarks Nationalbank, many other central banks also have a gold stock as part of the foreign exchange reserve for historical reasons.

## The contents of Danmarks Nationalbank's gold stock

Danmarks Nationalbank's gold stock stood at around 66.5 tonnes at the end of 2020. Most of the stock consisted of gold bars, which were stored in depositories at the Bank of England in London and the Federal Reserve Bank of New York, USA.

Only a small part of the stock (about 1.8 tonnes) was stored at Danmarks Nationalbank in Copenhagen. This consists of three gold bars and some historical gold coins. One of the three gold bars is the one that was exhibited to the public from 2007 to 2020 in a partially open glass showcase in the Danmarks Nationalbank building at Havnegade 5 in Copenhagen.<sup>31</sup> The other two gold bars were found in the villa (Rydhave) on Strandvejen in Copenhagen, where the former German official representative in Denmark, Dr. Best, lived during the German occupation of Denmark during World War II.<sup>32</sup> The two gold bars were deposited with Danmarks Nationalbank in July 1945 by the subsequent resident of Rydhave (Admiral Holt). Both gold bars were marked 1940. Later, the gold bars

were handed over by the Allies to the “Commissioner for the Confiscation of German and Japanese Property”<sup>33</sup>, who sold them to Danmarks Nationalbank in May 1947.

Under the gold coin standard before World War I, as mentioned earlier, Danmarks Nationalbank was obliged to convert banknotes into gold coins, meaning that gold coins were a central part of the gold stock at the time. Danmarks Nationalbank's gold stock still includes a number of old 10- and 20-krone gold coins produced by the Royal Mint during the gold standard period. Many of these “Scandinavian gold coins” have never been in circulation. This means that they are not coins in the traditional sense, but rather semi-finished gold (gold in a form other than bars). From 2008 and for some years onwards, the public could buy these gold coins via the Royal Mint's website at a price based on the current market value of gold. Accordingly, sales prices were adjusted continuously when the gold price changed.<sup>34</sup> The Royal Mint's purchases of gold coins from Danmarks Nationalbank's foreign exchange reserve for sale to the public were executed in a number with a total weight equal to a whole gold bar. Danmarks Nationalbank then bought a “replacement gold bar” for the foreign exchange reserve of roughly the same weight as the coins for the gold depository at the Bank of England. The stock of monetary gold was thus not affected in terms of volume by the Royal Mint's coin sales.

The gold stock also includes some West Indian gold coins. This reflects the Danish involvement in the monetary system in the West Indian Islands in the early 20th century.<sup>35</sup> The Danish-West Indian National Bank was established by an act of 29 March 1904 with a view to creating a stable monetary system in the Danish West Indian Islands and promoting economic development in the islands. Danmarks Nationalbank, Privatbanken, Den Danske Landmandsbank and Københavns Handelsbank each contributed one

30 See Danmarks Nationalbank, *Report and Accounts 2001*; Danmarks Nationalbank, *Report and Accounts 2002*; Danmarks Nationalbank, *Report and Accounts 2003*; Danmarks Nationalbank, *Report and Accounts 2004*; Danmarks Nationalbank, *Report and Accounts 2005*; Danmarks Nationalbank, *Report and Accounts 2006*; and Danmarks Nationalbank (2003), *Financial Management at Danmarks Nationalbank*.

31 See Danmarks Nationalbank (2017), *The Danmarks Nationalbank Building*.

32 See Andersen, Lisbeth and Steffen Linvald (eds.) (1979), *Copenhagen – when did it happen?* (in Danish only), Politikens Forlag.

33 See Act no. 132 on the confiscation of German and Japanese property of 30 March 1946 (in Danish only).

34 See the page “Sale of old gold coins” (in Danish only) on the Royal Mint website of 8 April 2008 (in Danish only) ([link](#)) and the Royal Mint, *Coin Catalogue 2013* (in Danish only).

35 See Abildgren, Kim (2018), *Danmarks Nationalbank 1818-2018*, Rosendahls; Begtrup, Jens Worm (2010), *Danish-West Indian National Bank 1904-1935* (in Danish only), *Erhvervshistorisk årbog*, Vol. 59, pp. 183-211; and Wilcke, J. (1930), *Silver and Gold Coin Standards 1845-1914* (in Danish only), Gads Forlag.



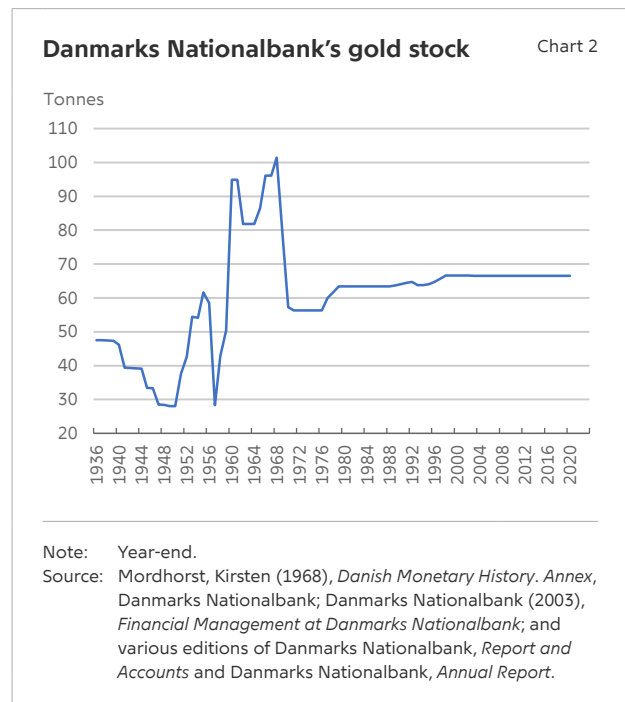
fourth of the equity capital. The Danish-West Indian National Bank was granted a monopoly on issuing banknotes on the islands for a period of 30 years and was also to conduct retail banking operations. 10 per cent of the bank's net proceeds was to be transferred to the Danish government as taxes. The currency unit of the banknotes issued was franc (divided into 100 bits) and the banknotes could be exchanged for Danish kroner (in Scandinavian gold coins) at a fixed exchange rate via the bank's office in Copenhagen. At the same time as the Danish-West Indian National Bank Act, a Coinage Act for the West Indies was implemented on 29 March 1904. The main coins were 20 and 50 francs in gold, and the coins were made at the Royal Mint in Copenhagen.

## The size of the gold stock over time

The development in Danmarks Nationalbank's gold stock since the mid-1930s is shown in chart 2.

The decline in the gold stock from 1939 to 1945 primarily reflects gold sales in connection with payments relating to Denmark's foreign debt: During World War II, the Danish legation in the USA had access to Danmarks Nationalbank's gold stock in New York, and gold was sold during the war years from Danmarks Nationalbank's depository in the USA to cover interest payments on the central government's dollar debt.<sup>36</sup>

In the years 1937-46, the sale of gold for technical use (e.g. for dentists), viewed in isolation, contributed to a modest reduction in the gold stock.<sup>37</sup> The background was that Danmarks Nationalbank had



asked the Ministry of Trade to abolish access to free imports of gold for technical use. The request was motivated by fears that the Danish krone could come under pressure from this channel during a possible currency crisis. Instead, gold could then be acquired for technical use from Danmarks Nationalbank.

In the 1950s and 1960s, some of the movements in the gold stock were due to transactions with the US Treasury within the Bretton Woods system, see chart 3. In the 1950s, Denmark bought a substantial amount of gold from the US Treasury. In 1969, Denmark sold a large amount of gold of just over 22 tonnes to increase the highly liquid part of the for-

<sup>36</sup> See Mordhorst, Kirsten (1968), *Danish Monetary History. Annex* (in Danish only), Danmarks Nationalbank; Danmarks Nationalbank, *Report and Accounts 1940* (in Danish only); Danmarks Nationalbank, *Report and Accounts 1941* (in Danish only); and Danmarks Nationalbank, *Report and Accounts 1945*. Some of these gold sales could not be entered to Danmarks Nationalbank's accounts until 1945.

<sup>37</sup> See Danmarks Nationalbank, *Report and Accounts 1937* (in Danish only); Danmarks Nationalbank, *Report and Accounts 1938* (in Danish only); Danmarks Nationalbank, *Report and Accounts 1939* (in Danish only); Danmarks Nationalbank, *Report and Accounts 1940* (in Danish only); Danmarks Nationalbank, *Report and Accounts 1941* (in Danish only); Danmarks Nationalbank, *Report and Accounts 1942* (in Danish only); Danmarks Nationalbank, *Report and Accounts 1943* (in Danish only); Danmarks Nationalbank, *Report and Accounts 1944* (in Danish only); Danmarks Nationalbank, *Report and Accounts 1945*; and Danmarks Nationalbank, *Report and Accounts 1946*.

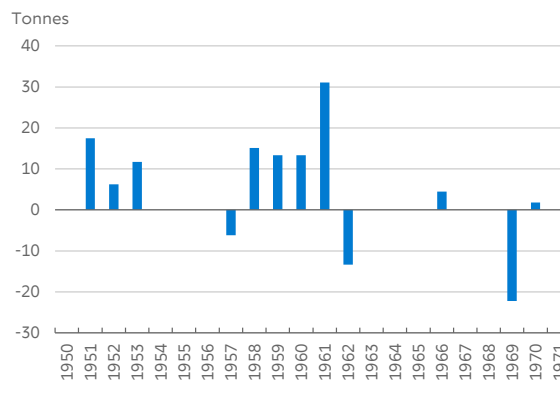
foreign exchange reserve in connection with an international currency crisis.<sup>38</sup>

The movements in the gold stock can also be attributed to transactions with the International Monetary Fund (IMF). In 1947, Denmark paid about 5 tonnes of gold to the IMF as part of Denmark's quota as an IMF member country.<sup>39</sup> Additional gold was paid to the IMF linked to the quota as well as subsequent increases in 1949<sup>40</sup>, 1959<sup>41</sup>, 1966<sup>42</sup> and 1970<sup>43</sup>. There were also other types of transactions with the IMF. For example, Danmarks Nationalbank paid gold to the IMF in 1971 in connection with the repayment of a previous Danish drawing on the IMF<sup>44</sup>, and the IMF sold gold to Denmark against kroner in 1965<sup>45</sup> and 1968<sup>46</sup> in connection with other countries' drawings on the IMF. In addition, between 1977 and 1979 the IMF sold about 6.9 tonnes of gold back to Denmark.<sup>47</sup>

The increase in Danmarks Nationalbank's gold stock in the years from the late 1980s until the early 2000s reflects interest income from Danmarks Nationalbank's gold lending and borrowing in the years 1987-2004, see below. The interest on gold lending was paid in gold, and the gold interest was either sold or went towards the gold stock.<sup>48</sup>

Denmark's net purchases of gold from the US Treasury

Chart 3



Note: Purchases at the official parity under the Bretton Woods system at 35 dollars per troy ounce of fine gold. 1971 covers the 1st to the 3rd quarters.

Source: Calculated on the basis of press releases from the United States Department of the Treasury (United States net monetary gold transactions with foreign countries).

Danmarks Nationalbank's gold stock has remained largely unchanged since the early 2000s.

38 See Danmarks Nationalbank, *Report and Accounts 1969*.

39 See Danmarks Nationalbank, *Report and Accounts 1946*; Danmarks Nationalbank, *Report and Accounts 1947*; and IMF, *Annual Report 1947*.

40 See Danmarks Nationalbank, *Report and Accounts 1949*.

41 See Danmarks Nationalbank, *Report and Accounts 1959*.

42 See Danmarks Nationalbank, *Report and Accounts 1965*; and Danmarks Nationalbank, *Report and Accounts 1966*.

43 See Danmarks Nationalbank, *Report and Accounts 1970*.

44 See Danmarks Nationalbank, *Report and Accounts 1971*.

45 See Danmarks Nationalbank, *Report and Accounts 1965*.

46 See Danmarks Nationalbank, *Report and Accounts 1968*.

47 See Danmarks Nationalbank, *Report and Accounts 1976*; Danmarks Nationalbank, *Report and Accounts 1977*; Danmarks Nationalbank, *Report and Accounts 1978*; Danmarks Nationalbank, *Report and Accounts 1979*; and IMF, *Annual Report 1980*.

48 See Bie, Ulrik and Astrid Henneberg Pedersen (1999), *The Role of Gold in the Monetary System*, *Danmarks Nationalbank Monetary Review*, Vol. 38(3), pp. 19-35; Danmarks Nationalbank (2003), *Financial Management at Danmarks Nationalbank*; Danmarks Nationalbank, *Report and Accounts 2003*; and Danmarks Nationalbank, *Report and Accounts 2004*.

## Gold lending

The return on a gold stock basically consists of any capital gains resulting from a rising gold price. In the mid-1980s, an international gold lending market emerged in London, and in 1987 Danmarks Nationalbank began to lend gold from its Bank of England depository to banks with high credit ratings in order also to obtain a continuous return on its gold.<sup>49</sup>

In the international market for gold lending, central banks can lend gold for, for example, three or six months to commercial banks. The commercial banks in turn lend the gold to, for instance, mining companies wishing to hedge against future price falls for gold. For example, if a mining company in May wants to hedge against a fall in the price of mining gold next August, it may choose in May to borrow gold from a commercial bank for three months subject to an interest rate. The mining company sells the borrowed gold in the spot market in May and returns gold (from its mining operations in August) to the commercial bank in August. This means that the mining company has in reality sold the gold from its mining operations in August at the gold price applying in May. For some mining companies, this may also be an attractive approach to obtaining short-term financing.

When lending gold, the gold bars are not necessarily moved physically (if the borrower has not needed to sell or use the borrowed gold bars). Nor does the lender necessarily get back the same gold bars at the end of the loan period, just gold bars of the same type and quality. It is common for the exact amount of gold lent differ slightly from the amount of gold returned at the end of the loan period. The market practice is to settle the difference as a purchase or sale of gold.<sup>50</sup> Therefore, lending transactions can lead to minor fluctuations in a gold stock. Lending gold on standard terms requires gold bars of a standardised type (London deliverable gold bars) and gold coins cannot be lent.

As described, there were many transactions between Danmarks Nationalbank and the US Treasury during the Bretton Woods period, and by the mid-1980s the bulk of Danmarks Nationalbank's gold stock was held in custody at the Federal Reserve Bank in New York. In order for Danmarks Nationalbank to benefit substantially from the new international gold lending market in London, gold had to be moved from its New York depository to its London depository.

The gold bars in Danmarks Nationalbank's New York depository consisted of so-called "US melts" cast by the US Mint for the US Treasury with greater variation in the weight of the individual bars than permitted by the London deliverable standard. The gold bars thus had to be remelted if they were to be lent on standardised terms in London.

The remelting took place over a number of years in connection with lending transactions where gold bars were lent from Danmarks Nationalbank's depository in New York against the return of London deliverable gold bars in Danmarks Nationalbank's depository at the Bank of England at the end of the loan period (so-called location swap lending with quality upgrading). The costs of this change in the gold stock meant, all other things being equal, lower net interest income from gold lending than would have been the case with lending London deliverable gold bars on standard terms from a London depository. After a number of years, most of Danmarks Nationalbank's gold stock in London was London deliverable gold bars.<sup>51</sup> However, a small portion of the gold stock was still held in custody at the Federal Reserve Bank in New York. Retaining the depository in New York enabled Danmarks Nationalbank to also enter into gold lending agreements in London with return of the gold to New York.

49 See box 1 in Bie, Ulrik and Astrid Henneberg Pedersen (1999), *The Role of Gold in the Monetary System, Danmarks Nationalbank Monetary Review*, Vol. 38(3), pp. 19-35.

50 See World Gold Council (2019), *A Central Banker's Guide to Gold as a Reserve Asset*, August.

51 See Bie, Ulrik and Astrid Henneberg Pedersen (1999), *The Role of Gold in the Monetary System, Danmarks Nationalbank Monetary Review*, Vol. 38(3), pp. 19-35.

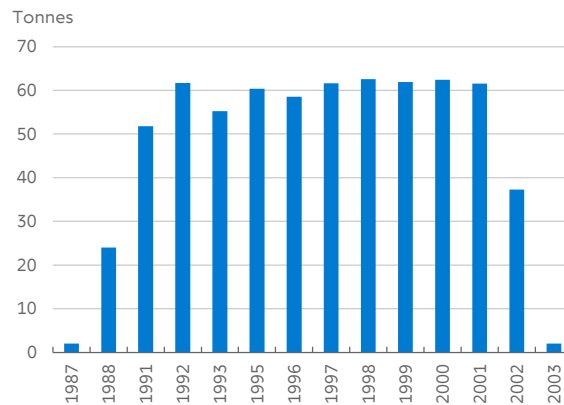
In 2002, Danmarks Nationalbank remelted a large stock of gold coins and a small number of non-standard gold bars from the gold stock in Copenhagen as standardised gold bars. The remelted gold bars were moved to London for lending or borrowing against in the international gold market. Danmarks Nationalbank had bought the gold coins from Norges Bank in 1997, see box 3.<sup>52</sup>

As mentioned above, Danmarks Nationalbank began lending gold from its bank of England depository in 1987. In the late 1990s and early 2000s, large parts of the stock had been lent, see chart 4.

Danmarks Nationalbank stopped lending gold during 2004.<sup>53</sup> By then, interest rates on gold lending had become so low that revenues no longer matched the administrative costs and the (limited) credit risk of lending.<sup>54</sup>

Danmarks Nationalbank's gold lending

Chart 4



Note: Year-end except 1988 (November), 1991 (October), 1992 (September) and 1993 (March).

Source: Various editions of Danmarks Nationalbank, *Report and Accounts*; Danmarks Nationalbank's document archive at the Danish National Archives and internal material at Danmarks Nationalbank.

**Purchase and remelting of Scandinavian gold coins from Norges Bank**

Box 3

The Scandinavian Currency Union entailed that Danish, Swedish and Norwegian krone coins had the same gold content as from the mid-1870s and could circulate freely in the three countries as legal tender.

In the second half of the 1990s, Norges Bank still had a large amount of Danish gold coins from the Currency Union in its gold stock. The gold coins had been issued by the Royal Mint, which Danmarks Nationalbank had taken over from the government in 1975. The coins were in principle still legal tender in Denmark.

Norges Bank contacted Danmarks Nationalbank about the gold coins in connection with a restructuring of its gold stock. The result of the request was that in October 1997 Danmarks Nationalbank received coins from Norges Bank with a gold content of about 1.6 tonnes of fine gold in return for supplying gold bars of similar weight to Norges Bank's gold depository at the Bank of England.

Danmarks Nationalbank considered selling off the gold coins from Norges Bank in order to realise any numismatic added value, i.e. added value in relation to the actual gold value due to interest in coins among coin collectors. After an analysis, it was considered that the risks of a sale were too high in relation to the expected net revenue. These were not coins of particular numismatic value, so the sales prices were not much higher than the gold value of the coins.

After consulting the National Museum of Denmark, Danmarks Nationalbank decided in 2002 to have the gold coins from Norges Bank remelted together with 13 non-standard gold bars from Danmarks Nationalbank's gold stock in Copenhagen. It was all remelted into 1.7 tonnes of standardised gold bars (London deliverable), which was then added to the depository at the Bank of England for lending or borrowing against in the international gold market.

52 See Norges Bank, *Report and Accounts 1997*; and Danmarks Nationalbank, *Report and Accounts 2002*.

53 No significant gold lending was made in 2004, see Danmarks Nationalbank, *Report and Accounts 2004*.

54 See Danmarks Nationalbank, *Report and Accounts 2005*; and Danmarks Nationalbank (2003), *Financial Management at Danmarks Nationalbank*.

## Geographical location of the gold stock

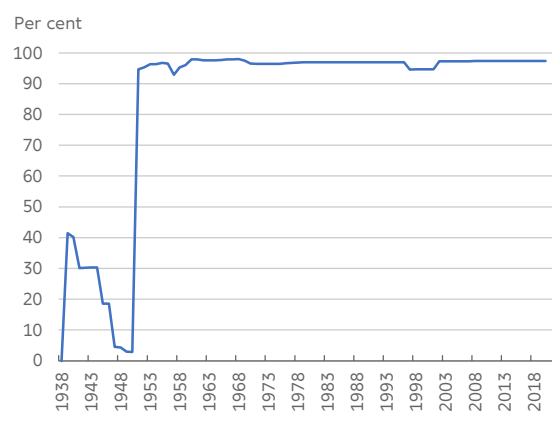
The physical storage of Danmarks Nationalbank's gold is determined, among other things, on the grounds of security, costs and logistics. The latter includes the consideration of being able to sell or borrow against the gold in the international gold market, should foreign exchange need to be raised to defend the krone exchange rate. Of Danmarks Nationalbank's gold stock of around 66.5 tonnes at the end of 2020, 0.4 tonnes were placed in custody with the Federal Reserve Bank of New York, 64.4 tonnes in custody with the Bank of England and the remaining 1.8 tonnes at Danmarks Nationalbank in Copenhagen.

The geographical location of the gold stock has varied over time. In the late 1930s, the gold stock was located in Copenhagen, see chart 5. During 1939 and early 1940, much of the gold was moved to the Federal Reserve Bank in New York, USA.<sup>55</sup> The gold was transported very secretly in a series of shipments via Sweden and Norway. This was due to fears that Germany would occupy Denmark and reports that the central banks of the countries occupied by Germany had been robbed of their gold reserves. A total of 19.6 tonnes<sup>56</sup> of Danmarks Nationalbank's gold was shipped to the USA just before the occupation. This represented about 40 per cent of Danmarks Nationalbank's total gold stock at the end of 1939.

After the war, most of Danmarks Nationalbank's gold abroad was repatriated to Copenhagen.

Share of Danmarks Nationalbank's gold stock located abroad

Chart 5



Note: Year-end except 1938 (February) and 1991 (August). The observations for the years 1989-90 and 1992-94 have been interpolated.

Source: Danmarks Nationalbank's document archive at the Danish National Archives and internal material at Danmarks Nationalbank.

55 See Danmarks Nationalbank, *Report and Accounts 1945*; Bie, Ulrik and Astrid Henneberg Pedersen (1999), *The Role of Gold in the Monetary System*, *Danmarks Nationalbank Monetary Review*, Vol. 38(3), pp. 19-35; and Abildgren, Kim (2018), *Danmarks Nationalbank 1818-2018*, Rosendahls. The relocation of the gold to the USA just before the German occupation of Denmark is based, among other things, on archive documents from Danmarks Nationalbank described in Lidegaard, Bo (2003), *Overleveren 1914-1945*, in: Due-Nielsen, Carsten, Ole Feldbæk and Nikolaj Petersen (eds.), *Denmark's foreign policy history* (in Danish only), Volume 4, Gyldendal; and Denta, Henrik (2015), *Guld og bedrag* (in Danish only), Gads Forlag.

56 The 19.6 tonnes of gold corresponded to a book value of around kr. 47 million, calculated according to the krone's gold value in the Coinage Act of 1873 (1 kg fine gold = kr. 2,480). The market value of the gold was significantly higher. The official US gold price in 1939 was 35 dollars per troy ounce of gold. At the dollar exchange rate in mid-1939 (kr. 4.795 per dollar), this corresponded to a market price of approximately kr. 5.396 per kg fine gold, see Danmarks Nationalbank, *Report and Accounts 1939*. The market value of the 19.6 tonnes of gold was thus around kr. 106 million.

Following the outbreak of the Korean War in 1950, the international situation became tense again, and in 1951 it was decided again to relocate a large part of the gold stock in Copenhagen abroad. 5.4 tonnes of gold were moved from Copenhagen to Danmarks Nationalbank's new gold depository in London. In addition, 13.8 tonnes of gold were moved from Copenhagen to London – Danmarks Nationalbank had sold this gold to the BIS and Banque de France for delivery in London against dollars. Danmarks Nationalbank used the dollar proceeds to buy gold bars from the Federal Reserve Bank of New York and the BIS for delivery at Danmarks Nationalbank's gold depository at the Federal Reserve Bank of New York and a new depository at the Bank of Canada in Ottawa. After these transactions – and after a series of further transactions between Danmarks Nationalbank's gold and dollar reserves in the first part of 1951 – the majority of Danmarks Nationalbank's gold stock was located in the USA.

This was still the case in the mid-1980s. When Danmarks Nationalbank began to lend gold in the international gold market in London in 1987, most of the gold stock was moved to the Bank of England over a number of years, as mentioned above. Since 2002, Danmarks Nationalbank has held about 0.5 per cent of its gold stock at the Federal Reserve Bank of New York, around 97 per cent of its gold stock at the Bank of England in London and the remaining around 2.5 per cent in Copenhagen.

Over the past decade, there has been increased focus on the location of central bank gold. In 2013, the German central bank (Deutsche Bundesbank) decided that half of its gold stock should be located in Frankfurt<sup>57</sup>, and some other countries' central banks (including the Netherlands<sup>58</sup>, Poland<sup>59</sup> and Austria<sup>60</sup>) have also repatriated gold in recent years.

In 2010, Danmarks Nationalbank initiated an investigation of various aspects of repatriating its gold. Based on an assessment of the security and cost issues of transporting the gold home and storing it in Denmark, Danmarks Nationalbank decided that the geographical location of the gold should not be changed for the time being. The current geographical location makes it also easier to sell or borrow against the gold in the international gold market if foreign exchange needs to be raised to defend the krone exchange rate.

## Gold in the annual accounts

Since 1988, the gold stock has been shown in Danmarks Nationalbank's annual accounts on the balance sheet at year-end market value.<sup>61</sup> Both realised and unrealised capital gains and losses on gold are recognised in the income statement. Accordingly, viewed in isolation, fluctuations in the price of gold may lead to significant variations in Danmarks Nationalbank's accounting results. Since 2015, any transfers of Danmarks Nationalbank's profits to the central government have especially taken into account the fluctuations in the gold price by basing the transfers on accounting results excluding value adjustments on gold.<sup>62</sup>

It is worth noting a number of special issues regarding the treatment of gold in Danmarks Nationalbank's annual accounts before 1988:

- The value of the gold deposited by Danmarks Nationalbank at the end of the years 1979-97 with the European Monetary Cooperation Fund (EMCF) and later the European Monetary Institute (EMI) was not included under the asset item

57 See press release *Bundesbank plans to relocate part of its gold reserves*, Deutsche Bundesbank, 16 January 2013; and press release *Bundesbank completes gold transfer ahead of schedule*, Deutsche Bundesbank, 23 August 2017.

58 See De Nederlandsche Bank, *Annual Report 2014*.

59 See press release *Narodowy Bank Polski has completed the operation of bringing gold to Poland*, Narodowy Bank Polski, 25 November 2019.

60 See Oesterreichische Nationalbank (2018), *Gold storage policy of the Oesterreichische Nationalbank*.

61 See Danmarks Nationalbank, *Report and Accounts 1988*; Danmarks Nationalbank, *Report and Accounts 1998*; Danmarks Nationalbank, *Report and Accounts 2013*; and Danmarks Nationalbank, *Annual Report 2020*.

62 See Danmarks Nationalbank, *Annual Report 2015*.

“Stock of gold” in Danmarks Nationalbank’s annual accounts 1979-97. The ecu claims received were included in the asset item “European Currency Units (ECUs)” and later “Claims on the European Monetary Institute”.

- From 1979 to 1987, the value of gold was fixed according to the same principle as in the EMCF, i.e. the average gold price quoted in London in the last six months, but not higher than the price on the penultimate trading day of the year.<sup>63</sup> This valuation principle resulted in valuation in the years 1983-87 of the gold stock at the price on the penultimate trading day and thus in practice at market value.<sup>64</sup>
- From 1969 to 1978, the gold stock was entered at the par value of the krone notified to the IMF.<sup>65</sup>
- In the years 1951-68, the gold stock was spread over several items on the balance sheet and with different valuations. Part of the gold stock was included under the item “Stock of gold” and valued according to the krone’s value in gold under the Coinage Act of 1873 (1 kg fine gold = kr. 2,480). The remainder was included under “Foreign assets”, valued at the par value of the krone notified to the IMF under the Bretton Woods system.<sup>66</sup>

After the Bank of England opened up the possibility of inspection visits, Danmarks Nationalbank carried out physical inspections in 2014 and 2018 at the Bank of England, where samples of the gold stock were checked.<sup>67</sup> The registration numbers and purity of the sample of gold bars were checked by reading the stamp on the gold bars, which were also weight checked and ultrasound scanned. Ultrasound scanning is used to check that the individual gold bar is made of the same material throughout. The inspections did not give rise to any comments.

## Control and audit of the gold stock

Danmarks Nationalbank receives annual statements (auditor’s statement or custody statement) from the Bank of England and the Federal Reserve Bank of New York of the gold deposited by Danmarks Nationalbank with the two central banks. The statements are used in accordance with good international practice to confirm the presence of Danmarks Nationalbank’s gold in the same way as, for example, bond custody statements.

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63 See Danmarks Nationalbank, *Report and Accounts 1988*; and Danmarks Nationalbank, *Report and Accounts 1979*.

64 See Danmarks Nationalbank, *Report and Accounts 1983*; Danmarks Nationalbank, *Report and Accounts 1984*; Danmarks Nationalbank, *Report and Accounts 1985*; Danmarks Nationalbank, *Report and Accounts 1986*; and Danmarks Nationalbank, *Report and Accounts 1987*.

65 See Danmarks Nationalbank, *Report and Accounts 1979*.

66 See Danmarks Nationalbank, *Report and Accounts 1968*; and Danmarks Nationalbank, *Report and Accounts 1969*.

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67 See Danmarks Nationalbank, *Report and Accounts 2014*; and the page “Danmarks Nationalbank’s gold” on Danmarks Nationalbank’s website ([link](#)).

## PUBLICATIONS



### NEWS

News offers quick and accessible insight into an Analysis, an Economic Memo, a Working Paper or a Report from Danmarks Nationalbank. News is published continuously.



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Working Papers present research projects by economists in Danmarks Nationalbank and their associates. The series is primarily targeted at professionals and people with an interest in academia. Working Papers are published continuously.

The analysis consists of a Danish and an English version. In case of doubt regarding the correctness of the translation the Danish version is considered to be binding.

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