



Kim Abildgren

WEBAPPENDIX

# Danmarks Nationalbank 1818-2018

DANMARKS  
NATIONALBANK  
200 YEARS

2018

LA ANFORDRING MED GUI  
ALBANKEN I KJØBENHAV

# Webappendix

# State bankruptcy and a chaotic Monetary system

## Predecessors of Danmarks Nationalbank

Besides Rigsbanken, there were other predecessors of Danmarks Nationalbank. The first banknote-issuing bank in Denmark was Kurantbanken (Den Kjøbenhavnske Assignations-, Veksel- og Laanebank), established in 1736. Originally, Kurantbanken was obliged to convert its banknotes to silver coins, but it was not subject to any banknote coverage rules, and the silver convertibility was abolished permanently in 1757. Kurantbanken had been established as a private limited liability company, but was taken over by the central government in 1773. In 1791, another private banknote-issuing bank was established, Den Dansk-Norske Speciesbank, which was intended to replace Kurantbanken over a period of many years. But the discontinuation of Kurantbanken and the withdrawal of its banknotes did not go according to plan. On the contrary, the circulation of Kurantbank banknotes and other money substitutes increased strongly in connection with the Napoleonic Wars.

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Rasmussen, Erik (1950), *Kurantbankens oprettelse* (Establishment of Kurantbanken – in Danish only), *Historisk Tidsskrift*, Vol. 11(3), pp. 137-175.

Rasmussen, Erik (1955), *Kurantbankens forhold til staten 1737-73* (Kurantbanken and the Danish state 1737-73 – in Danish only), Det Danske Forlag.

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## The state bankruptcy in 1813

The currency reform of 1813 introduced a new currency unit in Denmark, the rigsbankdaler (1 rigsbankdaler = 96 rigsbankskilling). Already in 1811-12, the state had ceased to pay interest and repayments in silver on part of its debt. Instead, it was paying in

banknotes not convertible to silver. That is why the currency reform is often called the "state bankruptcy".

The reform meant exchange of existing banknotes in the old currency unit (kurantdaler) for new banknotes at an exchange rate of 6 kurantdaler to 1 rigsbankdaler. During the period of high inflation up to the reform, the kurantdaler's value had dropped markedly relative to silver. The exchange rate of 6:1 was intended to ensure that the substitution would essentially reflect the relationship between the silver value of banknotes in kurantdaler and rigsbankdaler, respectively. Consequently, the losses of holders of monetary claims in kurantdaler were not caused by the actual substitution – but by the erosion of wealth in the preceding years due to high inflation.

The currency reform contained a number of complicated provisions on redemption of private debt raised in kurantdaler. The purpose was to ensure that the creditors were repaid amounts with the same value in silver as the debt at the time it was raised. For example, as a general rule, private debt in kurantdaler raised in 1808 was to be repaid with a larger number of rigsbankdaler than debt raised in 1812 for the same amount in kurantdaler.

With the currency reform, government debt in kurantdaler was to be converted at the same exchange rate as banknotes (6:1) if the creditor called in the debt immediately. If a creditor was willing to declare his government bonds as interminable and accept a temporary interest rate cut, the debt was converted 1:1.

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Hansen, Svend Aage (1972), *Danske penge gennem tiderne* (Danish money through the ages – in Danish only), in: Mette Koefoed Bjørnsen and Evan Bogan (eds.), *Penge*, Politikens Forlag.

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Olsen, Erling (1962), *Danmarks økonomiske historie siden 1750* (An economic history of Denmark since 1750 – in Danish only), Gads Forlag.

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### **Establishment of Danmarks Nationalbank in 1818 and its activities in the first half of the 19th century**

Danmarks Nationalbank (Nationalbanken i København) was born in 1818 by a restructuring of Rigsbanken. The aim was to restore people's trust in the monetary system in the wake of the period of high inflation and the massive government finance problems during the Napoleonic Wars.

Danmarks Nationalbank was to continue Rigsbanken's work of reducing the circulation of banknotes to enable a price increase up to the official silver value. The instrument applied was a restrictive lending policy. This meant that the banknotes received as repayment of loans were not just paid out again as new loans. Moreover, Danmarks Nationalbank's earnings were used to reduce the circulation of banknotes. The banknotes related to the earnings were not just used automatically to buy e.g. securities; but were cancelled instead, causing Danmarks Nationalbank's equity to rise. It took many years to restore the monetary system.

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Johansen, Hans Chr. (1994), *Danish banking history*, in: Sabine Freitag and Manfred Pohl (eds.), *Handbook on the History of European Banks*, Edward Elgar, pp. 97-131.

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### **An international perspective on the establishment of Danmarks Nationalbank – the history of other central banks**

Danmarks Nationalbank was established in 1818, which makes it one of the oldest existing central banks in the world. The oldest one is Sveriges Riksbank, established in 1668, followed by the Bank of England, which is from 1694. The central banks of Finland, the Netherlands, Norway and Austria were all established in the years 1811-16. Most central banks in the world did not come into being until the 20th century, including the Federal Reserve in the USA, which was established in 1913. One of the most recent – and probably best prepared – central banks is the European Central Bank (ECB), established in 1998.

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Jobst, Clemens and Hans Kernbauer (2016), *The Quest for Stable Money. Central banking in Austria 1816-2016*, Campus Verlag.

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Jones, Lowell C. (ed.) (2012), *The Balance of Power: The Political Fight for an Independent Central Bank, 1790 – present*, 2nd edition, Federal Reserve Bank of Kansas City.

Kuusterä, Antti and Juha Tarkka (2011), *Bank of Finland 200 years. Volume I: Imperial cashier to central bank*, Otava Publications.

Kuusterä, Antti and Juha Tarkka (2011), *Bank of Finland 200 years. Volume II: Parliament's bank*, Otava Publications.

Lie, Einar, Jan Thomas Kobberrød, Gjermund F. Rognved and Eivind Thomassen (2016), *Norges Bank 1816-2016* (in Norwegian only), Fagbokforlaget.

Mikiver, Ann-Leena and Gunnar Wetterberg (2018), *Sveriges Riksbank – a 350-year journey*, Sveriges Riksbank.

Scheller, Hanspeter K. (2006), *The European Central Bank. History, Role and Functions*, 2nd revised edition, European Central Bank.

Swiss National Bank (2007), *The Swiss National Bank 1907-2007*, Neue Zürcher Zeitung Publishing.

Wetterberg, Gunnar (2009), *Money and Power. From Stockholms Banco 1656 to Sveriges Riksbank today*, Atlantis.

### **Central banking issues related to the Danish Monarchy (Norway, Schleswig-Holstein and Iceland)**

Denmark and Norway were in a personal union until the Peace Treaty of Kiel in 1814. The separation of Denmark and Norway reduced the circulation area for the new rigsbankdaler, impacting both Rigsbankens issuance of banknotes and the size of the bank mortgage.

Eitrheim, Øyvind and Jan F. Qvigstad (eds.) (2005), *Tilbageblikk på norsk pengehistorie. Konferanse 7. juni 2005 på Bogstad gård* (A Norwegian monetary history in retrospect. Conference on 7 June 2005 at Bogstad gård – in Norwegian only), *Norges Bank Occasional Papers*, No. 37.

Hansen, Svend Aage and Knud Erik Svendsen (1968), *Dansk pengehistorie 1700-1914* (Monetary history of Denmark 1700-1914 – in Danish only), Danmarks Nationalbank.

Rubow, Axel (1918), *Nationalbankens historie 1818-1878* (History of Nationalbanken i København 1818-1878 – in Danish only), Nationalbanken i København.

The duchies of Schleswig and Holstein were attached to the Danish monarchy until Denmark's defeat in the Second Schleswig War in 1864. Since 1788, the duchies had had their own banknote-issuing government bank, Den Slesvig-Holstenske Speciesbank, which was subject to tight lending rules and obliged to convert its banknotes to silver. It managed to maintain the value of its banknotes relative to silver throughout the entire period until the monetary reform in 1813, which was taken into account in the cash changeover that was part of the reform. However, there was some scepticism in the duchies about the restructuring of the Danish currency system. Danmarks Nationalbank opened a branch in Flensburg in 1844. After the defeat in the war of 1864, Schleswig and Holstein were no longer part of the Danish currency area, although the branch in Flensburg continued its retail banking activities. It was acquired by Union-Bank in 1939. In 1920, North Schleswig was reunited with Denmark after a referendum in accordance with the Treaty of Versailles.

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Sørensen, Anders Ravn (2013), Monetary romanticism: nationalist rhetoric and monetary organisation in nineteenth-century Denmark, *Scandinavian Economic History Review*, Vol. 61(3), pp. 209-232.

Iceland was part of the Danish currency area until the Act of Union between Iceland and Denmark in 1918. However, sometimes during this period there were banknotes in circulation with special Icelandic features or special Icelandic banknotes – similar to the system of Faroese banknotes today. Iceland could conduct its own foreign exchange policy from 1918. The Icelandic króna (ISK) was introduced in 1918 on a 1:1 basis with the Danish krone (DKK). The parity between the Icelandic króna and the Danish krone existed until the spring of 1922, when the Icelandic króna fell by around 25 per cent against the Danish krone. In the 4th quarter of 1924, the average exchange rate was 1.09 ISK per DKK. In the autumn of 1925, the Icelandic króna was pegged to the pound sterling (GBP) at ISK 22.15 per GBP. The Icelandic króna was generally stable against the pound until April 1939, when it was devalued by around 20 per cent (to ISK 27.00 per GBP). When World War II broke out, the Icelandic króna was pegged to the dollar instead of the pound. Iceland and Denmark ceased to be a united monarchy in 1944, when the Republic of Iceland was established.

Central Bank of Iceland (2002), *The Currency of Iceland. Issues and features of Icelandic notes and coins*, 2nd edition, Central Bank of Iceland.

### **The West Indies**

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 (now the US Virgin Islands) and promoting economic development in the Islands. Danmarks Nationalbank and three private banks each contributed one fourth of the share capital. Denmark sold its West Indian Islands to the USA in 1917. The Danish-West Indian National Bank continued operating until the mid-

1930s. Its right to issue banknotes expired in 1934, when the dollar was introduced as the Islands' currency. The retail banking activities of the Danish-West Indian National Bank ceased in 1935.

Begtrup, Jens Worm (2010), Den Dansk-vestindiske Nationalbank 1904-1935 (The Danish-West Indian National Bank 1904-1935 – in Danish only), *Erhvervs-historisk Årbog*, Vol. 59, pp. 183-211.

#### **Danmarks Nationalbank's head office and branches**

Ever since its establishment, Danmarks Nationalbank has had its head office in Copenhagen. Previously, it had branches in Aarhus (1837-1989), Aalborg (1881-1972), Nykøbing Falster (1882-1964), Odense (1901-89) and Kolding (1902-68). The branches played an important role in connection with lending and cash supply.

Danmarks Nationalbank (2017), *The Danmarks Nationalbank Building*, 3rd edition, Danmarks Nationalbank.

Märcher, Michael (2005), "i Jylland ... findes faa Capitalister". Et studie i det jyske Bank-Contoir i Aarhus' etablering og virke 1837-1848 ("In Jutland ... there are but few capitalists". A study of the establishment and operation of the Jutland bank branch in Aarhus 1837-1848 – in Danish only), *Erhvervshistorisk Årbog*, Vol. 54, pp. 91-114.

#### **Price stability and central bank independence in a historical perspective**

Based on historical experience, there is now consensus that the best foundation for stable prices is achieved when the central bank is independent.

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# The Danmarks Nationalbank Act of 1936

## Extension of the Charter of Danmarks Nationalbank in 1907 and the Danmarks Nationalbank Act of 1936

Danmarks Nationalbank's Charter of 1818 was in force for 90 years and was extended by another 30 years in 1907 with a few minor adjustments. An actual new legal basis did not come about until the Danmarks Nationalbank Act of 1936 which is still the legal basis for Danmarks Nationalbank's activities today.

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## History of central bank objectives and tasks

A central bank's core task can best be characterised as contributing to the provision of public goods in the form of stable prices, safe and secure payment systems and financial stability. The weighting of the individual tasks varies across countries and has followed economic and political developments over time.

Bernanke, Ben S. (2013), A Century of US Central Banking: Goals, Frameworks, Accountability, *Journal of Economic Perspectives*, Vol. 27(4), pp. 3-16.

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Beyer and Lucrezia Reichlin (eds.), *The Role of Money – Money and Monetary Policy in the Twenty-First Century*, European Central Bank, pp. 208-243.

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Goodhart, Charles A. E. (2011), The changing role of central banks, *Financial History Review*, Vol. 18(2), pp. 135-154.

Haldene, Andrew G. and Jan F. Qvigstad (2016), *The Evolution of Central Banks: A Practitioner's Perspective*, in: Michael D. Bordo, Øyvind Eitrheim, Marc Flandreau and Jan F. Qvigstad (eds.) (2016), *Central Banks at a Crossroads: What Can We Learn from History?*, Cambridge University Press, pp. 627-671.

## Central bank openness and transparency in a historical perspective

Recent decades have seen a general evolvement of more openness and transparency among the world's central banks. Basically, monetary policy in a country with a fixed exchange rate policy is highly transparent, because the public can easily check in the daily news media whether the fixed exchange rate is adhered to.

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Footman, John and Richard Windram (2010), The history of the Quarterly Bulletin, *Bank of England Quarterly Bulletin*, Vol. 50(4), pp. 258-266.

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# Low inflation for 200 years – with a few exceptions

## Historical development of prices and inflation

In several countries, it is possible to track price and wage developments all the way back to the Middle Ages. Inflation was often high in periods of war, as the costs of war were financed by printing more money and the supply of goods was reduced. If periods of war are disregarded, the high inflation in the first three to four decades after the end of World War II stands out.

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Kærgård, Niels (1991), *Den danske løn-prisudvikling 1904-1970* (Danish wage-price developments 1904-1970 – in Danish only), Chapter 13 in: Niels Kærgård (1991), *Økonomisk vækst. En økonometrisk analyse af Danmark 1870-1981* (Economic growth. An econometric analysis of Denmark 1870-1981 – in Danish only), Jurist- og Økonomforbundets Forlag, pp. 315-350.

MacFarlane, Helen and Paul Mortimer-Lee (1994), Inflation over 300 years, *Bank of England Quarterly Bulletin*, Vol. 34(2), pp. 156-162.

Qvigstad, Jan F. (2005), 500 years of price history: Price stability is the norm. What distinguishes the abnormal?, *Norges Bank Staff Memo*, No. 7.

Schuppli, Pascal and Roman Studer (2008), Deflating Swiss Prices over the Past Five Centuries, *Historical Methods*, Vol. 41(3), pp. 137-153.

## Hyperinflation in Germany in the early 1920s

History has witnessed many examples of how monetary financing of government budget deficits has led to high inflation. One of the most famous examples is the hyperinflation in Germany in the early 1920s, when money almost lost its value. A currency reform was

implemented at the end of 1923 as part of the battle against inflation in Germany, and no less than 12 zeros were removed from the banknotes.

Bresciani-Turroni, Constantino (1937), *The Economics of Inflation. A Study of Currency Depreciation in Post-War Germany*, G. Allen & Unwin.

Hetzel, Robert L. (2002), German Monetary History in the First Half of the Twentieth Century, *Federal Reserve Bank of Richmond Economic Quarterly*, Vol. 88(Winter), pp. 1-35.

Holtfrerich, Carl-Ludwig (1980), *Die deutsche Inflation 1914-1923: Ursachen und Folgen in internationaler Perspektive*, Walter de Gruyter.

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Sargent, Thomas J. (1986), *Rational Expectations and Inflation*, Harper & Row.

Schacht, Hjalmar (1927), *Die Stabilisierung der Mark*, Deutsche Verlags-Anstalt Stuttgart.

Sommariva, Andrea and Giuseppe Tullio (1987), *German Macroeconomic History 1880-1979: A Study of the Effects of Economic Policy on Inflation, Currency Depreciation, and Growth*, Macmillan.

Webb, Steven B. (1989), *Hyperinflation and Stabilization in Weimar Germany*, Oxford University Press.

## Hyperinflation in Zimbabwe in the 2000s

Zimbabwe is the most prominent example of hyperinflation in the 21st century. Annual inflation in Zimbabwe reached 89.7 sextillion per cent during 2008, meaning that prices doubled in less than 25 hours.

Hanke, Steve H. and Alex K. F. Kwok (2009), On the Measurement of Zimbabwe's Hyperinflation, *Cato Journal*, Vol. 29(2), pp. 353-364.

## Deflation in a historical light

Deflation is when prices in general fall year after year. Like high inflation, persistent deflation may have serious economic implications.



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### **Index-linked bonds**

In 1974, in the light of the higher inflation, a working group was established to look into the pros and cons of inflation-indexed savings and funding. Denmark's Nationalbank participated in this working group, which submitted its report in 1975 ("Redegørelse fra arbejdsgruppen vedr. indeksering af pengefordringer december 1974" (Report by the working group on indexation of monetary claims December 1974 – in Danish only), betænkning (Report) No. 732). In 1982, mortgage banks were allowed to grant index-linked loans based on issuance of index-linked bonds, the outstanding debt of which was increased by the rate of inflation, resulting in a real yield on these bonds. However, index-linked loans never came to constitute any significant share of home financing in Denmark. Index-linked loans were introduced at a time when annual inflation was around 10 per cent and bond yields around 20 per cent, but both inflation and long-term yields fell substantially over the next decade. In a low-inflation economy, the need for inflation hedging was less pronounced among both borrowers and investors. In 2012, the Danish central government began to issue inflation-indexed bonds, but only to a limited extent.

Andersen, Jens Verner and Jacob Gyntelberg (1999), Index-linked mortgage bonds, *Danmarks Nationalbank Monetary Review*, Vol. 38(1), pp. 49-60.

Ølgaard, Anders (1975), Finansiering under inflation – indeksslån og andre løsningsmuligheder (Funding during inflation – index-linked loans and other possible solutions – in Danish only), *Danish Journal of Economics (Nationaløkonomisk Tidsskrift)*, Vol. 113(1), pp. 55-59.

# A fixed exchange rate has provided for stable prices

## The silver and gold standards before World War I

Danmarks Nationalbank introduced convertibility of its banknotes to silver coins in 1845, meaning that Denmark joined the silver standard. The Danish Coinage Act of 1873 replaced the silver-based currency system with a gold-based one. Many of Denmark's trading partners also followed the gold standard in the late 1800s and early 1900s. During the gold standard period, it was possible to move capital more or less freely across national borders, and the system provided for fixed exchange rates among the participating countries. The international gold standard system was suspended on the outbreak of World War I in 1914.

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.

Bordo, Michael D. and Hugh Rockoff (1996), *The Gold Standard as a "Good Housekeeping Seal of Approval"*, *Journal of Economic History*, Vol. 56(2), pp. 389-428.

Eichengreen, Barry and Marc Flandreau (1996), *The geography of the Gold Standard*, in: Jorge Barga de Macedo, Barry Eichengreen and Jaime Reis (eds.), *Currency Convertibility. The Gold Standard and Beyond*, Routledge, pp. 113-143.

Eichengreen, Barry and Marc Flandreau (eds.) (1997), *The Gold Standard in Theory and History*, 2nd edition, Routledge.

McKinnon, Ronald I. (1993), *The Rules of the Game: International Money in Historical Perspectives*, *Journal of Economic Literature*, Vol. 31(1), pp. 1-44.

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## The Scandinavian Currency Union

In 1872, Norway, Sweden and Denmark concluded an agreement on the Scandinavian Currency Union. The agreement contained common standards for the gold content of the countries' main coins, and from the mid-1870s until the outbreak of World War I, a Danish, a Swedish and a Norwegian krone coin had the same gold content.

Bergman, U. Michael (1999), *Do Monetary Unions Make Economic Sense? Evidence from the Scandinavian Currency Union 1873-1913*, *Scandinavian Journal of Economics*, Vol. 101(3), pp. 363-377.

Bergman, U. Michael and Lars Jonung (2011), *Business Cycle Synchronization in Europe: Evidence from the Scandinavian Currency Union*, *The Manchester School*, Vol. 79(2) pp. 268-292.

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Heckscher, Eli F. (1922), *Den Nordiska Myntunionen* (The Nordic Currency Union – in Swedish only), *Danish Journal of Economics (Nationaløkonomisk Tidsskrift)*, Vol. 60, pp. 8-27.

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### **The currency systems of the interwar years**

The international gold standard system was suspended at the outbreak of World War I in 1914, but re-established during the 1920s. The Danish krone returned to the gold standard in 1927 at the 1913 parity. The UK abandoned the gold standard again in September 1931, and Denmark followed suit shortly after.

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### **The Exchange Control Office**

In the first half of the 1930s, international trade was an extensive web of bilateral trade agreements – in Denmark visualised by the establishment of the Exchange Control Office (Valutacentralen) in 1932. The bilateral trade agreements made it necessary to import foreign goods in return for exports of Danish products, so the Exchange Control Office was tasked with distributing the given imports to the Danish business sector via a system of import licences with the aim of ensuring the highest possible employment.

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### **The European Payments Union**

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After World War II, Denmark participated in the dollar-based fixed exchange rate system which was established under the auspices of the International Monetary Fund (the Bretton Woods system). This system collapsed in the early 1970s.

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### **The International Monetary Fund**

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### **European exchange rate arrangements**

After the collapse of the Bretton Woods system in the early 1970s, the krone joined the European exchange rate arrangements, first the Currency Snake and from 1979 the European Exchange Rate Mechanism (ERM and ERM2).

The general principles for ERM2 were adopted at the European Council in Amsterdam in June 1997. For each currency participating in ERM2, a central rate is set in relation to the euro, as well as a fluctuation band around the central rate, normally +/- 15 per cent. However, it is possible for a country to negotiate a narrower band. If a currency reaches one of the limits of the fluctuation band, the ECB (provided that this is compatible with the ECB's monetary policy) and the relevant national central bank must keep the currency within the fluctuation band by buying the weak currency and selling the strong one. Non-euro area member states may choose whether or not to participate in ERM2, but they must participate in ERM2 for two years before they can join the euro area.

Denmark succeeded in negotiating an ERM2 agreement with a narrow fluctuation band of +/- 2.5 per cent.

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### **Ground rules for the fixed exchange rate policy**

The fixed exchange rate policy requires a clear distribution of responsibility for economic policy. In a fixed exchange rate regime, a central bank uses its interest rates for exchange rate control. This means that they cannot also be used for management of the

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#### **Fixed exchange rate policy and trade gains**

A fixed exchange rate policy has some very specific gains over floating exchange rates. A fixed exchange rate policy eliminates uncertainty about the exchange rate against the currency anchor. This benefits exporters, who save currency risk hedging costs. A fixed exchange rate policy also entails efficiency gains from increased trade with the countries in the currency anchor. Analyses have shown that the fixed exchange rate policy has enabled Denmark – unlike Sweden and the UK – to harvest many of the trade gains that the euro area member states have enjoyed as a result of the single currency.

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# Danmarks Nationalbank's toolbox: Interest rates and foreign exchange reserves

## Danmarks Nationalbank's toolbox since the 1970s

Interest rate adjustments and purchase and sale of foreign exchange are Danmarks Nationalbank's most important monetary and foreign exchange policy instruments. From the mid-1960s until the early 1980s, ceilings on lending by deposit banks and mortgage banks and reserve requirements for deposit banks were included in the toolbox. As tools go, they were not very efficient.

Capital flows in connection with portfolio investments were almost fully liberalised in the mid-1980s, and the 1990s and 2000s were characterised by an increasing volume of cross-border capital flows. But Danmarks Nationalbank was still able to control the krone rate, since the effect on the exchange rate of portfolio flows diminished over time as the credibility of the fixed exchange rate policy increased.

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Ministry of Business and Growth Denmark (2013), *Den finansielle krise i Danmark – årsager, konsekvenser og læring* (The financial crisis in Denmark – causes, consequences and lessons – in Danish only), Schultz.

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## Gold, Danmarks Nationalbank's gold stock and its toolbox during the gold standard period

For historical reasons, many central banks hold stocks of gold, which previously played a key role in

banknote issuing. This is also reflected in the Danmarks Nationalbank Act of 1936. The Act specifies that Danmarks Nationalbank must possess gold covering 25 per cent of the value of banknotes in circulation, but since 1939 an exemption from the gold coverage provision has been granted. When the Act was written, it was expected that the gold standard would be reintroduced at a later date. The gold standard ensured more or less automatically fixed exchange rates among the participating countries.

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Henriksen, Ingrid and Niels Kærgård (1995), *The Scandinavian Currency Union 1875-1914*, in: Jamie Reis (ed.), *International Monetary Systems in Historical Perspective*, Macmillan, pp. 91-112.

#### **The history of official fixing of exchange rates**

Official fixing of exchange rates in Denmark was introduced as early as in 1787. During its 200-year history, Danmarks Nationalbank has played a key role in connection with fixing and communication of exchange rates.

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#### **Foreign exchange crises, turmoil and pressures on the krone since the 1990s**

Danmarks Nationalbank's instruments are really called into action when the krone comes under pressure. They have proved to be robust and have stood the test through the foreign exchange crises of the 1990s, with downward pressure on the krone, as well as in recent years with upward pressure on the krone.

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# From savings banks to financial supermarkets

## The bilateral credit market before 1800

Throughout most of the 18th century, no deposit banks or mortgage credit institutes existed in Denmark. Credit was mainly granted on a bilateral basis between individuals. There were a few royal loan funds and predecessors of Danmarks Nationalbank that lent money.

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Møller, Michael and Niels Chr. Nielsen (1997), *Dansk realkredit gennem 200 år* (200 years of Danish mortgage credit – in Danish only), BRFKredit.

Thueslev, H. (1976), *Det Kongelige Assistenshus. Københavns Assistenshus og anden Pantelånevirkksomhed* (The state pawnbroking establishment. The pawnbroking establishment in Copenhagen and other pawnbroking activities – in Danish only), Gads Forlag.

## Savings banks

The establishment of Sparekassen for Grevskabet Holsteinborg og Omegn in 1810 is traditionally regarded as the arrival of the savings bank movement in Danish monetary history. The savings bank was founded by count Frederik Adolph Holstein and was located at his estate, Holsteinborg near Skælskør. It is indeed the first savings bank in Denmark if “Denmark” is taken to mean “the Kingdom of Denmark”. But at the time, Denmark was a monarchy that also included the duchies of Schleswig and Holstein, among other areas. And in Germany, savings banks had already been known for decades when the 19th century dawned. The first savings bank in the Danish monarchy was founded in

Kiel back in 1796 and another one opened in Altona in 1801. In a way, there was also a savings bank in the Kingdom of Denmark before 1810. In 1795, the government established “Den almindelige Forsørgelsesanstalt” (the general charitable institution). This was primarily a life assurance company, but among its departments was also a “savings fund”. Here, people could make deposits that earned 3 per cent p.a. in interest.

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## Commercial banks

Denmark’s first commercial bank, Fyens Diskonto Kasse, was established in Odense in 1846. Over the next few decades more commercial banks opened, including the three main banks (Privatbanken, Den Danske Landmandsbank and Handelsbanken) that were to dominate the banking structure for the next 100 years.

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vatbanken i København through 100 years 1857-1957, 1st half-volume: The Tietgen era – in Danish only), Privatbanken i København.

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Hansen, Per H. (1989), *Fyens Disconto Kasse, 1846-1886: Passiv- og aktivforretninger* (Fyens Disconto Kasse, 1846-1886: Liability and asset transactions – in Danish only), *Erhvervshistorisk Årbog*, Vol. 39, pp. 98-137.

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Hansen, Per H. and Søren Mørch (1997), *Den Danske Bank*, Centrum.

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### Cooperative banks

Besides commercial banks and savings banks, the Danish deposit-banking sector comprises cooperative

banks. The first one was established in 1915. Originally the cooperative banks were based on receiving deposits from and granting loans to members. However, the cooperative banks never played any major role as lenders in the Danish economy.

Guinnane, Timothy W. and Ingrid Henriksen (1998), *Why Danish Credit Co-operatives Were so Unimportant*, *Scandinavian Economic History Review*, Vol. 46(2), pp. 32-54.

### Mortgage banks

The first Danish mortgage bank, Kreditkassen for Husejere i København, was established in 1797 following the fire of Copenhagen in 1795. The first mortgage credit act was passed in 1850 and created the basis for the large market for Danish mortgage bonds that still exists.

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Thalbitzer, Carl (1922), *Kreditkassen for Husejere i København 1797-1922* (in Danish only), J. Jørgensen & Co.

### Life insurance companies and pension funds

The early introduction of a tax-funded old age pension scheme in Denmark (in 1891) originally reduced the potential size of the private pension sector. But recent decades have seen the build-up of contribution-based labour market pensions, reflected in strong growth in the assets managed by pension funds.

Feldbæk, Ole, Anne Løkke and Steen Leth Jepsen (2007), *Drømmen om tryghed. Tusind års dansk*

*forsikring* (Dreaming about security. A thousand years of Danish insurance – in Danish only), Gads Forlag.

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### Investment funds

The lifting of restrictions on cross-border portfolio investments in the 1970s and 1980s produced an increase in the volume of assets managed by investment funds. But the balance sheets of investment funds did not begin to grow in earnest until the second half of the 1990s.

Andersen, Victor, Torben Groth Hansen and Kaj Pre-skou (1998), *Trygge penge i 70 år* (Secure money for 70 years – in Danish only), Danske Invest.

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### Stock exchange and capital markets

The Copenhagen Stock Exchange was established in 1624. Originally, it was a commodity exchange where physical goods were exchanged. Trading in shares on the stock exchange can be traced back to the 1780s, and from the early 1800s government bonds were also traded.

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### Mechanisation and IT

Mechanical book-keeping machines were introduced in the banking sector in the mid-1920s and most large insurance companies introduced punch card machines for calculating risks and actuarial statistics in the inter-war period. By the 1960s, the time had come for electronic data processing. Some commercial banks and savings banks invested in their own data processing systems, while others joined forces and set up shared data centres – BEC, Bankdata and SDC were all established in the 1960s. The insurance and pension sector also introduced electronic data processing in the 1960s.

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### Size and development of the financial sector

Viewed in a long-term perspective, there has been considerable growth in the Danish financial sector's balance sheets relative to GDP. The same trend is evidenced in other countries. A well-developed financial sector brings savers and investors together, thereby reducing transaction costs. The financial sector also facilitates risk diversification, which reduces financing costs and promotes investment.

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Møller, Michael and Niels Chr. Nielsen (2000), *De finansielle institutioner: fortid og fremtid* (The financial institutions: past and future – in Danish only), *Danish Journal of Economics (Nationaløkonomisk Tidsskrift)*, Vol. 138(1), pp. 68-78.

### **Sector overlap, internationalisation and consolidation**

Until the mid-1980s, financial institutions were split into sectors with clear divides between banking, mortgage credit and insurance activities. From the mid-1980s, the first financial groups began to emerge, i.e. financial enterprises that operated in several financial subsectors at the same time, such as banking, mortgage credit, insurance, etc. Many of the mergers that took place in the Danish financial sector in the first part of the 1990s were characterised by the formation of domestic financial groups. In the late 1990s and after 2000, the sector was increasingly also affected by globalisation, with mergers and acquisitions across borders.

Abildgren, Kim, Bodil Nyboe Andersen and Jens Thomsen (2010), *Monetary history of Denmark 1990-2005*, Danmarks Nationalbank.

### **The industrialisation of Denmark and its financing**

The last quarter of the 19th century and the first decade of the 20th are normally regarded as the period when the first wave of industrialisation hit Denmark. In this period, the major commercial banks participated actively in the establishment of companies within industry and transport and helped to raise investment capital (via share issues) and working capital (via lending). A mortgage bank (Kreditforeningen for industrielle Ejendomme) was also set up that was specifically aimed at supplying the industrial sector with mortgage finance.

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# When history repeats itself: banking and financial crises

## Banking crises before 1920

The banking crises before 1920 were far less serious than the great interwar banking crisis. The crises before 1920 were predominantly liquidity crises for individual banking institutions, rather than crises with major losses in the financial system overall.

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Abildgren, Kim (2017), Determinants of banks' capital structure in the Pre-Regulation Era, *European Review of Economic History*, Vol. 21(1), pp. 64-82.

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Cohn, Einar (1957), *Privatbanken i København gennem hundrede aar 1857-1957, I. halvbind: Tietgen-Tiden* (Privatbanken i København through 100 years 1857-1957, 1st half-volume: The Tietgen era – in Danish only), Privatbanken i København.

Hansen, Svend Aage and Knud Erik Svendsen (1968), *Dansk pengehistorie 1700-1914* (Monetary history of Denmark 1700-1914 – in Danish only), Danmarks Nationalbank.

Hoffmeyer, Erik (1960), *Strukturændringer på penge- og kapitalmarkedet. En studie i anledning af sparekassernes 150 års jubilæum* (Structural changes in the money and capital markets. A study to mark the 150th anniversary of savings banks – in Danish only), Sparevirkes Forlag.

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## The Alberti scandal and Den Sjællandske Bondestands Sparekasse

In 1908, former Minister for Justice Peter Adler Alberti gave himself up to the police and admitted that while he was the manager of Den Sjællandske Bondestands Sparekasse and the Farmers of Denmark's Butter Export Association, he had committed fraud. Den Sjællandske Bondestands Sparekasse had to be restructured by an act of parliament in May 1909, and Mr Alberti was sentenced to eight years' imprisonment in 1910.

Skou, Kaare R. (2016), *Magtens forblændelse. Hvordan justitsminister P.A. Alberti endte som danmarkshistoriens største svindler* (Dazzled by power. How Justice Minister P.A. Alberti ended up as the greatest fraudster in the history of Denmark – in Danish only), People's Press.

Skrubbeltrang, Fridlev (1959), *Den Sjællandske Bondestands Sparekasse 1856-1956*, Sparekassernes Tilsynsråd.

## The banking crisis of 1920-33

In the period from 1920 to 1933, 59 commercial banks were wound up or acquired by other banks, and 22 commercial banks were restructured at least once. By comparison, the total number of commercial banks was around 200 in 1920. The crisis was far milder for Denmark's 500 or so savings banks, which fared relatively well in a period with lack of trust in the commercial banks. The crisis landed all the 5 largest banking institutions in Denmark in difficulties:

- Landmandsbanken – which was the largest commercial bank in Scandinavia at that time – was restructured several times during the period 1922-28 with help from the Danish government and Danmarks Nationalbank.
- In 1922, a vain attempt was made to restructure Københavns Disconto og Revisionsbank with help from Danmarks Nationalbank and a number of large private commercial banks. The bank had to be wound up in 1924.
- Den danske Andelsbank was wound up in 1925.

- Privatbanken had to suspend payments in 1928 and was restructured with help from Danmarks Nationalbank and a number of private commercial banks.
- Handelsbanken experienced liquidity problems in 1931 and received help from Danmarks Nationalbank via a liquidity support statement.

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Abildgren, Kim (2018), Household leverage and consumption during the Great Depression, *Journal of Financial Regulation and Compliance*, Vol. 26(2), pp. 287-299.

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Hansen, Per H. (1996), *På glidebanen til den bitre ende. Dansk bankvæsen i krise 1920-1933* (On a slippery slope to the bitter end. Danish banking in crisis 1920-1933 – in Danish only), Odense Universitetsforlag.

Hoffmeyer, Erik and Erling Olsen (1968), *Dansk pengehistorie 1914-1960* (Monetary history of Denmark 1914-1960 – in Danish only), Danmarks Nationalbank.

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Mørch, Søren (1986), *Det store bankkrak. Landmandsbankens sammenbrud 1922-1923* (The great bank crash. The collapse of Landmandsbanken 1922-1923 – in Danish only), Gyldendal.

### Financial stability in the decades after World War II

After the many bank failures of the interwar years, the period from the end of World War II until the beginning of the 1980s was remarkably calm in the Danish banking sector. The same applied in many other countries.

Abildgren, Kim (2016) Household micro-data, regulation and financial stability: The case of Denmark in the 1950s, *Studies in Economics and Finance*, Vol. 33(2), pp. 320-335.

### The banking crises in the 1980s and early 1990s

Towards the end of 1984, Denmark's seventh largest commercial bank, Kronebanken, became distressed, and the years until the mid-1990s were characterised

by a number of serious crises in the Danish financial sector. Danmarks Nationalbank was directly involved in finding solutions for six deposit banks in financial difficulties. They were: Kronebanken (1984-85), 6' Juli Banken (1987-88), C&G Banken (1987-88), Unibank (1992), Varde Bank (1992-93) and Himmerlandsbanken (1993). In many cases, acquisition of the ailing institutions by other banks was part of the solution and in several cases there was money left over for the shareholders. Danmarks Nationalbank also provided bridge financing in connection with the Faroese banking crisis in the early 1990s.

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Ministry of Economic Affairs (1994), *Den danske pengeinstituttsektor* (The Danish banking sector – in Danish only), Schultz.

Ministry of Economic Affairs (1995), *Redning af pengeinstitutter siden 1984* (Bank rescue actions since 1984 – in Danish only), Schultz.

Mølgaard, Eigil (2003), *Vagthund og syndebuk. Personlig beretning om finanskrisen i Danmark 1987-1995* (Watchdog and scapegoat. A personal story about the financial crisis in Denmark 1987-1995 – in Danish only), Børsens Forlag.

Vastrup, Claus (2009), *How did Denmark avoid a banking crisis?*, Chapter 8 in: Lars Jonung, Jaakko Kaizer and Pentti Vartia (eds.), *The Great Financial Crisis in Finland and Sweden*, Edward Elgar.

### The financial crisis of 2007/08-13

During 2008, the world economy was hit by the most severe downturn in peacetime since the Great Depression in the 1930s. The crisis was triggered by turmoil in the US financial markets following the downturn in the US housing market, which spread to the financial markets in Europe in the 2nd half of 2007. Initially it was a liquidity crisis for the banking system, but during 2008 it became clear that the losses of some of the world's major financial enterprises were so severe that solvency and financial stability were at risk. In Denmark, the deposit banks' loan impairment charges soared in 2008, and several of the medium-sized institutions encountered difficulties. The Danish government had to step in with extensive guarantees and capital injections, and Danmarks Nationalbank established temporary loan facilities to support the liquidity of the deposit banks and mortgage banks.

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Iversen, Martin Jes (2013), *Sidste udvej. Finansiell Stabilitet og Danmarks bankkrise* (Last resort. Financial Stability and Denmark's banking crisis – in Danish only), Lindhardt og Ringhof.

Laeven, Luc and Fabian Valencia (2013), Systemic Banking Crises Database, *IMF Economic Review*, Vol. 61(2), pp. 225-270.

Ministry of Business and Growth Denmark (2013), *Den finansielle krise in Danmark – årsager, konsekvenser og læring* (The financial crisis in Denmark – causes, consequences and lessons – in Danish only), Schultz.

Reinhart, Carmen M. and Kenneth S. Rogoff (2009), *This time is different*, Princeton University Press.

#### **Historical developments in the regulation of the banking sector**

Banking and financial crises have often been followed by new regulatory initiatives aimed at making the financial system more resilient. The savings bank crisis of 1876-78 led to the first Danish savings bank act in 1880, and the construction and banking crisis in 1907-09 resulted in the first commercial banking act in 1919. After the most recent financial crisis, requirements for bank capital and liquidity have been tightened.

Hansen, Per H. (2001), Bank Regulation in Denmark from 1880 to World War Two: Public Interests and Private Interests, *Business History*, Vol. 43, pp. 43-68.

Hansen, Per H. (2010), Finansielle krisers efterspil i (Danmarks)historien, 1857-1930 (Consequences of financial crises in (Denmark's) history, 1857-1930 – in Danish only), *Samfundsøkonomen*, No. 1, pp. 23-28.

# Credit and house price bubbles

## Economic costs of banking crises

Banking crises have considerable negative consequences for the economy in the short and medium term. This underscores how important it is to pursue economic policy aimed at ensuring a stable economy so that we avoid periods of massive build-up of imbalances, followed by a crisis when the “bubble” bursts.

Abildgren, Kim, Birgitte Vølund Buchholst, Atef Qureshi and Jonas Staghøj (2011), Real economic consequences of financial crises, *Danmarks Nationalbank Monetary Review*, Vol. 50(3,2), pp. 1-50.

Bordo, Michael, Barry Eichengreen, Daniela Klingebiel and Maria Soledad Martinez-Peria (2001), Is the Crisis Problem Growing More Severe?, *Economic Policy*, Vol. 16(32), pp. 53-82.

Mikkelsen, Jakob Guldbæk and Jesper Pedersen (2017), A cost-benefit analysis of capital requirements for the Danish economy, *Danmarks Nationalbank Working Papers*, No. 123, December.

## Credit and house price bubbles

International analyses indicate that the most serious banking crises often follow in the wake of credit-financed property price bubbles. This diagnosis also broadly fits the two periods of banking crises seen in Denmark since the early 1980s. In both cases, the pre-crisis years were characterised by an overheated economy and soaring property prices.

Abildgren, Kim (2009), Credit Dynamics in Denmark since World War II, *Danish Journal of Economics (Nationaløkonomisk Tidsskrift)*, Vol. 147(1), pp. 89-119.

Abildgren, Kim and Jens Thomsen (2011), A tale of two Danish banking crises, *Danmarks Nationalbank Monetary Review*, Vol. 50(1,1), pp. 121-142.

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Brunnermeier, Markus K. and Isabel Schnabel (2016), *Bubbles and Central Banks: Historical Perspectives*, in: Michael D. Bordo, Øyvind Eitrheim, Marc Flandreau and Jan F. Qvigstad (eds.) (2016), *Central Banks at a Crossroads: What Can We Learn from History?*, Cambridge University Press, pp. 493-562.

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Jordà, Òscar, Moritz Schularick and Alan M. Taylor (2013), When Credit Bites Back, *Journal of Money, Credit and Banking*, Vol. 45(2), pp. 3-28.

Jordà, Òscar, Moritz Schularick and Alan M. Taylor (2015), Leveraged bubbles, *Journal of Monetary Economics*, Vol. 76, pp. S1-S20.

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# From coins to mobile apps – means of payment over 200 years

## Coins and banknotes

From the early times in Danish history, the King (and later the Danish state) had a monopoly on issuing coins, and according to the Coinage Act, the government is still responsible for minting coins. In 1975, the Royal Danish Mint was transferred from the government to Danmarks Nationalbank. Since then, production and administration tasks related to minting of coins have been delegated to Danmarks Nationalbank, including the obligation to redeem coins. All coins issued after 1875 with a value of kr. 0.50 or higher are still legal tender and can be exchanged for new coins.

The first banknotes in Denmark were issued in 1713. Since its establishment in 1818, Danmarks Nationalbank has had a monopoly on issuing banknotes. All banknotes issued by Danmarks Nationalbank after 1945 are legal tender in Denmark. However, it is up to retailers whether they are willing to accept old banknotes. If they refuse to do so, it is possible to exchange the banknotes at banks or at Danmarks Nationalbank.

Andersen, Gunnar (1975), *Banknotes. Principles and Aesthetics in Security Graphics*, 2nd edition, Danmarks Nationalbank.

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currency in Denmark?, *Danmarks Nationalbank Analysis*, No. 28, December.

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Jensen, Jørgen Steen (2001), *Danmarks mønter og sedler. Krone og øre fra 1875 til i dag* (Coins and banknotes of Denmark. Krone and øre from 1875 to date – in Danish only), Aschehoug.

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## Other means of payment

In 1818, there were no private banks, and the entire money stock consisted of coins and banknotes. Since then, other and more convenient means of payment have emerged. Nowadays, payments are most often made electronically via online banking, card or mobile telephone.

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office 1920-1991 – in Danish only), *Post & Giro Tidende*, Vol. 4, pp. 1-24.

Gregersen, Jens J. K. and Søren Sundorph (1989), *Den danske postgiros historie 1920-1990* (History of the Danish Postgiro system 1920-1990 – in Danish only), Postgiro.

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Schou, Peter (2006), *Dankortet – udvikling og perspektiver* (The Dankort – development and perspectives – in Danish only), Chapter 10 in: Michael Christensen and Anders Grosen (eds.), *Den finansielle sektor. Udvikling og perspektiver. Festskrift til Morten Balling*, Jurist- og Økonomforbundets Forlag, pp. 159-180.

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Wind, Bjarne (1993), *From Postgiro to Danish Girobank*, in: T. D. Bridge and J. J. Pegg, (eds.), *Post Giro Banking in Europe*, AQ & DJ Publications, pp. 107-115.

#### **Means of payment in the Faroe Islands and Greenland**

All parts of the Danish Monarchy – Denmark, the Faroe Islands and Greenland – share the same currency, the Danish krone, and Danmarks Nationalbank supplies the Faroe Islands and Greenland with banknotes. The coins in the Faroe Islands are the same as in Denmark, but since 1951, the Faroe Islands have had their own banknotes with Faroese motifs. Danish banknotes and coins are used in Greenland.

Andersen, Bodil Nyboe (2004), Speech at the Conference on the Economy in the Danish Commonwealth hosted by the North Atlantic Group of the Folketing (Parliament), 25 May 2004, *Danmarks Nationalbank Monetary Review*, Vol. 43(3), pp. 77-82.

Aningaasaqarnermut Naalakkersuisoqarfik. Ministry of Finance (2010), *Redegørelse om grønlandske pengesedler* (Report on Greenlandic banknotes – in Danish only), September.

# From counterfeiting to cybercrime

## Cash supply

Danmarks Nationalbank puts cash into circulation via the banks.

Wagener, Tom (1998), Denmark's cash supply system, *Danmarks Nationalbank Monetary Review*, Vol. 37(3), pp. 18-23.

Danmarks Nationalbank (2017), *The supply of cash in Denmark*, Danmarks Nationalbank.

## Counterfeiting

It is key to upholding the trust in the currency system that the number of counterfeit banknotes in circulation is low. Consequently, counterfeiting has always been severely punished.

Bie, Ulrik and Johan Sebastian Gabel (2002), Counterfeit banknotes, *Danmarks Nationalbank Monetary Review*, Vol. 41(1), pp. 33-41.

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Märcher, Michael (2012), *De kongelige møntsteder i Altona og København 1813-1873* (Royal Mints in Altona and Copenhagen 1813-1873 – in Danish only), Syddansk Universitetsforlag.

## Payment and settlement systems

Danmarks Nationalbank plays a key role in the payment system as banker to the banks. Today, interbank payments are made electronically via accounts at Danmarks Nationalbank in a payment system.

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Oma, Lindis (2017), Danes are front-runners in electronic payments, *Danmarks Nationalbank Analysis*, No. 6, March.

## Physical acts of terrorism, breakdown and cybercrime

Today, the financial sector depends heavily on complex IT systems, and it is important in relation to upholding trust in the financial system that they always work and are secure.

Danmarks Nationalbank (2005), *Payment systems in Denmark*, Danmarks Nationalbank.

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## The money changeover in 1945

Denmark was occupied by the Germans during World War II, and many of the occupation forces' expenses were financed by drawing on accounts at Danmarks Nationalbank, supported by guarantees from the government. This led to a strong increase in banknotes in circulation and it was necessary to substitute them after the war.

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# 200 years with a rising standard of living – despite fluctuations

## Development in standard of living and economic structures

The standard of living has improved substantially over the last 200 years. This improvement is in stark contrast to developments before 1800. Back then, good years made way for bad years, and basically real annual wages did not improve from 1500 to 1800.

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## Productivity growth

The economic growth seen over the last 200 years is attributable to production of still more goods and services with the same input of labour. In other words, productivity has risen significantly. There are many reasons for this, including a larger and still more efficient capital stock, a higher level of education and generally smarter ways of organising production, including increased division of tasks.

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### **Business cycles and financial crises**

Historically there has been a clear tendency for downturns with banking crises to be deeper or longer than downturns without banking crises.

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