

NORGES BANK PAPERS

Appendix to
Norges Bank Papers No. 5 | 2022: “A
framework for advice on the systemic
risk buffer”



NORGES BANK

Indicators for assessing structural vulnerabilities

Assessments of structural vulnerabilities comprise three main elements: a) how shocks propagate and are amplified within the financial system, b) structural features of the banking sector and c) the influence of the real economy on the banking sector. Norges Bank uses various indicators to assess these three elements. Indicators used as a starting point for the assessments are described below.

How shocks propagate and are amplified within the financial system

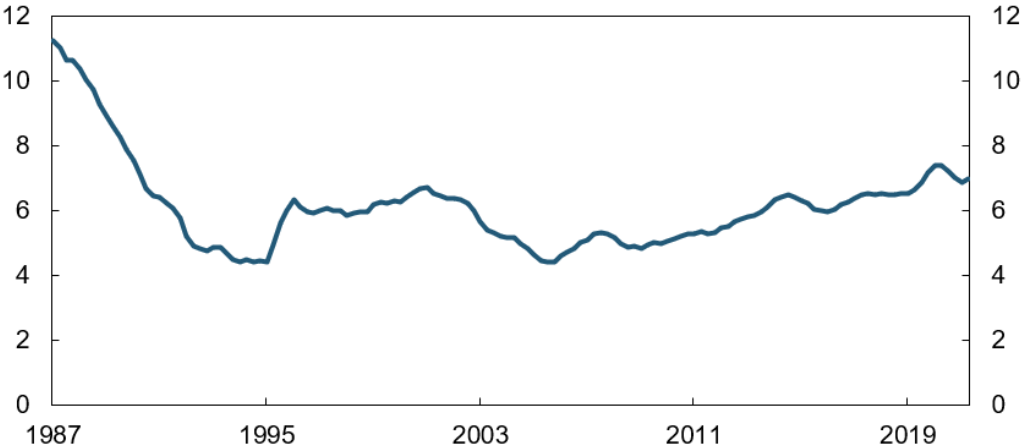
Banks' holdings of securities issued by other banks and financial institutions are a starting point for assessing banking sector interconnectedness (Charts 1.1 and 1.2).

Examining the largest banks' funding sources can indicate to what extent banks rely on the same sources (Chart 1.3). It is important to examine these funding sources at a more detailed level, to show different kinds of wholesale funding, for example (Chart 1.4).

The largest banks' loans to selected segments are a starting point for assessing whether banks have the same level of exposure to the same segment (Chart 1.5). Banks' exposures should be examined in more detail, such as banks' lending to various corporate sectors (Chart 1.6).

1.1 Interbank exposures

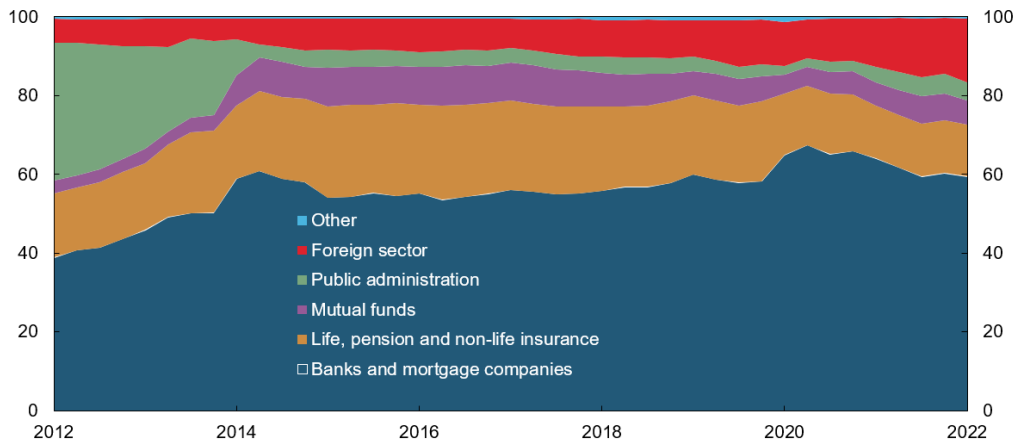
Banks' exposures to one another and to other financial institutions as a share of banks' total assets. Four-quarter average. Percent. 1987 Q4 – 2022 Q1



Sources: Statistics Norway and Norges Bank

Chart 1.2 Holders of covered bonds

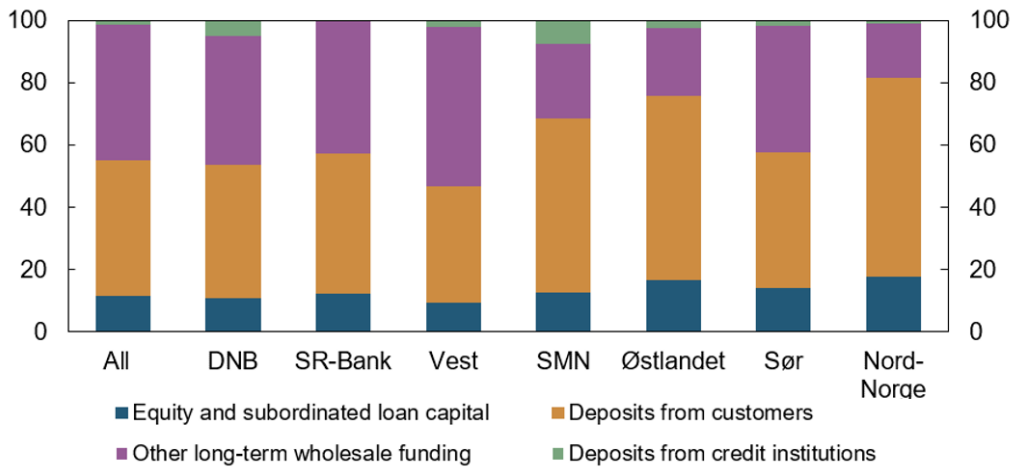
Issued in NOK by mortgage companies. Percent. 2012 Q1 – 2022 Q1



Source: Statistics Norway

Chart 1.3 Bank funding by source

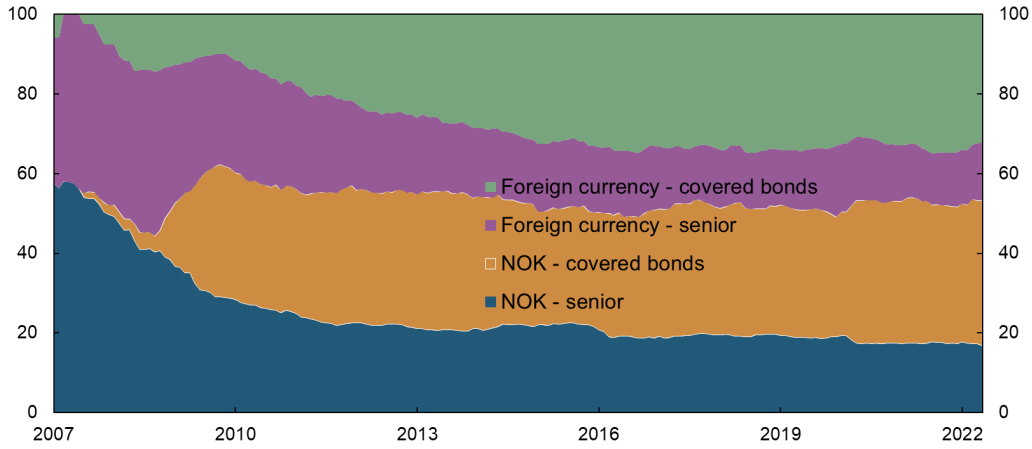
The seven largest Norwegian banks and all Norwegian banks and mortgage companies. Percent. December 2021¹⁾



1) Data for 2020 for Sparebanken Vest.
Sources: S&P Capital IQ and Norges Bank

Chart 1.4 Banks' wholesale funding in foreign currency

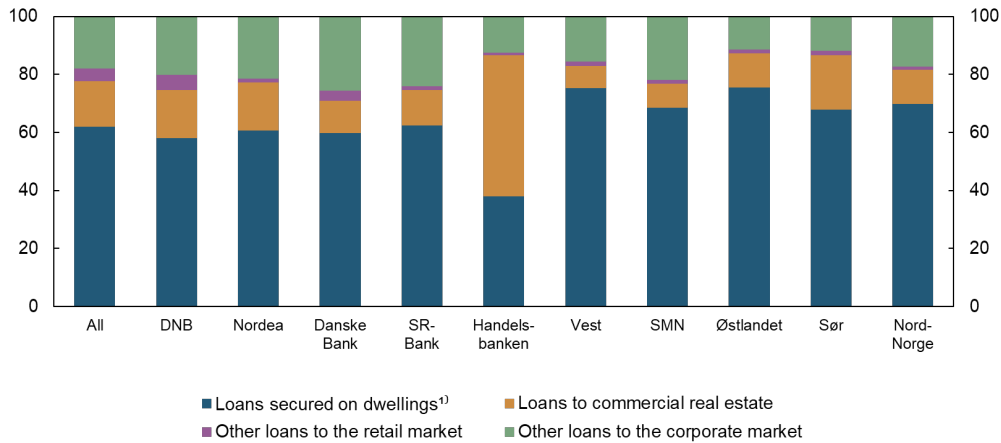
Bonds outstanding. All Norwegian banks and covered bond mortgage companies. Percent. January 2007 – May 2022



Sources: Bloomberg, Stamdata and Norges Bank

Chart 1.5 Bank lending to selected segments in Norway

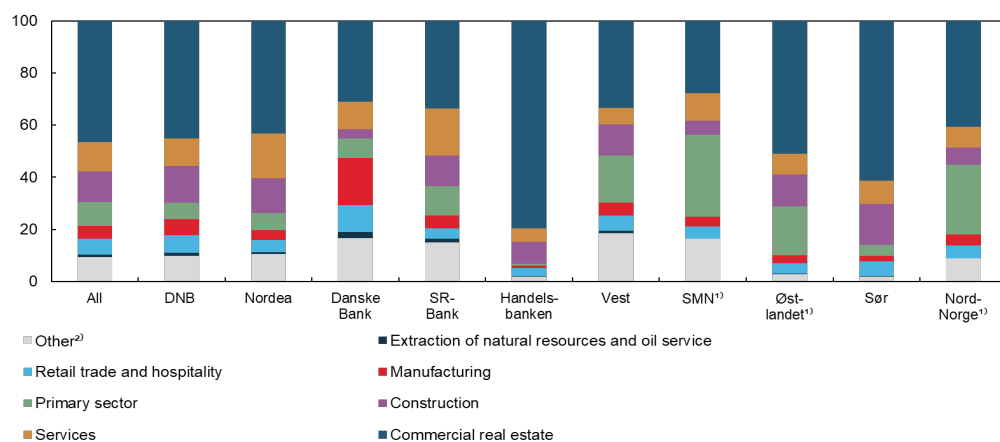
The ten largest banks and all banks and mortgage companies in Norway. Percent. December 2021



1) Includes residential mortgage loans provided by covered bond mortgage companies.
Source: Norges Bank

Chart 1.6 Sector classification of bank lending to the corporate market in Norway

Ten largest banks and all banks and mortgage companies in Norway.
Percent. December 2021



1) Data for SpareBank 1 SMN, SpareBank 1 Østlandet, and SpareBank 1 Nord-Norge do not include mortgage companies.

2) Other sectors include international shipping, other transport, retail trade and hospitality.

Source: Norges Bank

Structural features of the banking sector

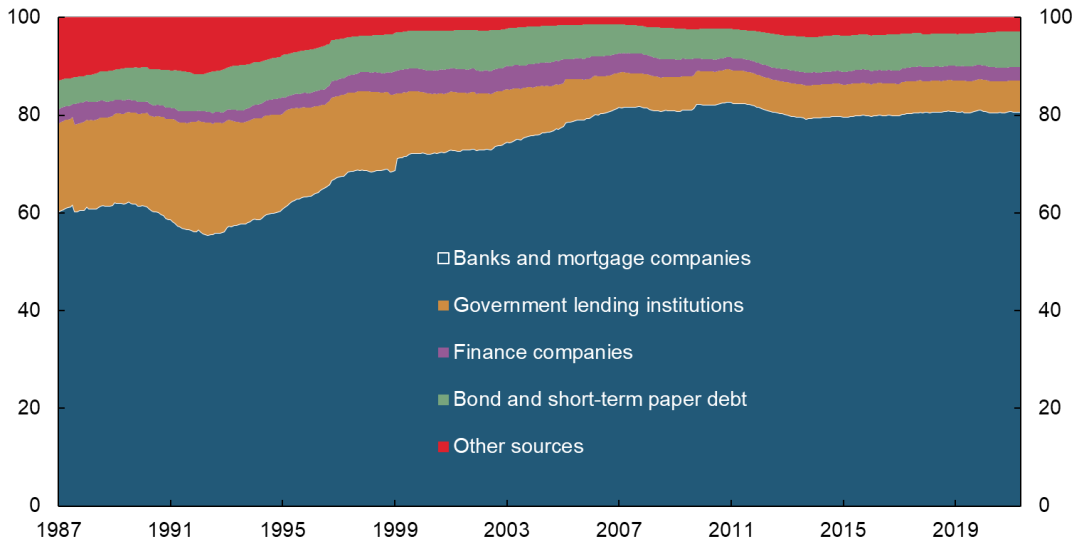
Banks' share of total private lending and the size of the banking sector relative to GDP provide an indication of the importance of banks for the total supply of credit in the economy and the potential for problems in the banking sector to affect the economy (Charts 1.7, 1.8 and 1.9). The trend credit-to-GDP ratio can also be useful when assessing the scale of bank credit, where the trend is intended to capture structural developments (Chart 1.10).

Another structural feature of the banking sector that can amplify vulnerabilities is banking sector concentration. Concentration can for example be assessed based on the largest banks' market shares (Chart 1.10) and the market concentration index, which is easier to compare over time and across countries (Charts 1.11 and 1.12). It can also be useful to assess individual markets and compare the largest bank's market shares with some of the next largest banks (Chart 1.13), which can provide an indication of how easy it is for other banks to take over customers if one or more of the large banks encounter difficulties.

If the proportion of banks with substantial foreign exposures is high, external shocks can rapidly spread to Norway. The assessment can be based on these branches' total market share in Norway (Chart 1.14). At the same time, these banks can dampen shocks that primarily affect Norway.

Chart 1.7 Total lending by source

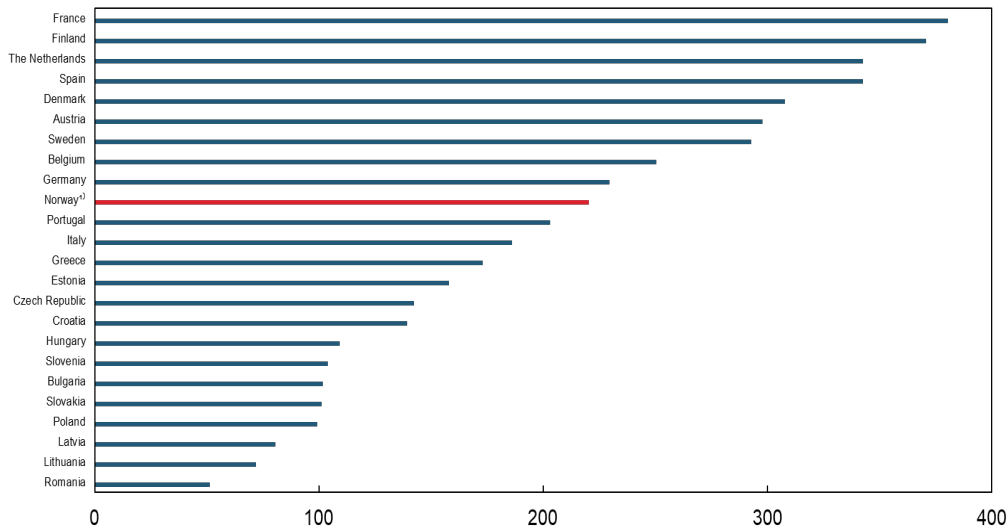
Gross lending by credit source. Share of total private lending. Percent.
December 1987 – April 2022



Source: Statistics Norway

Chart 1.8 Banks' assets by country

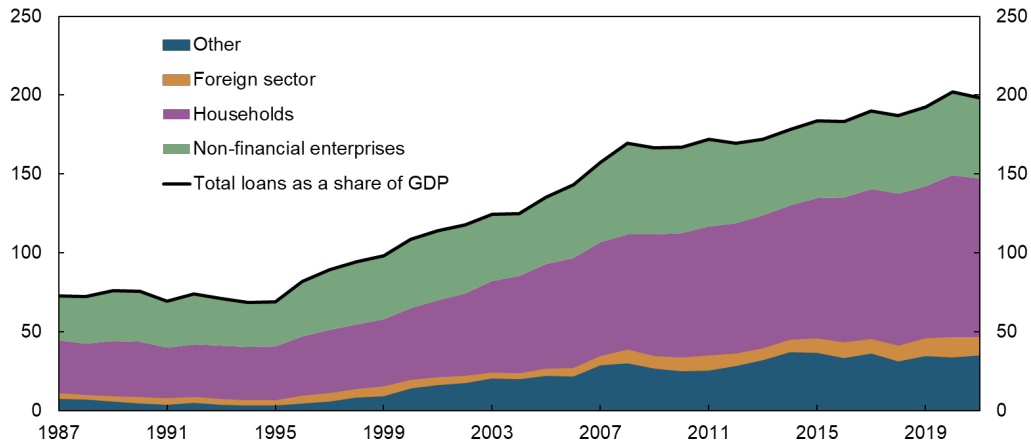
Total bank assets as a share of GDP¹⁾ for selected countries. Consolidated data. Percent.
2020



1) Mainland GDP is used for Norway.

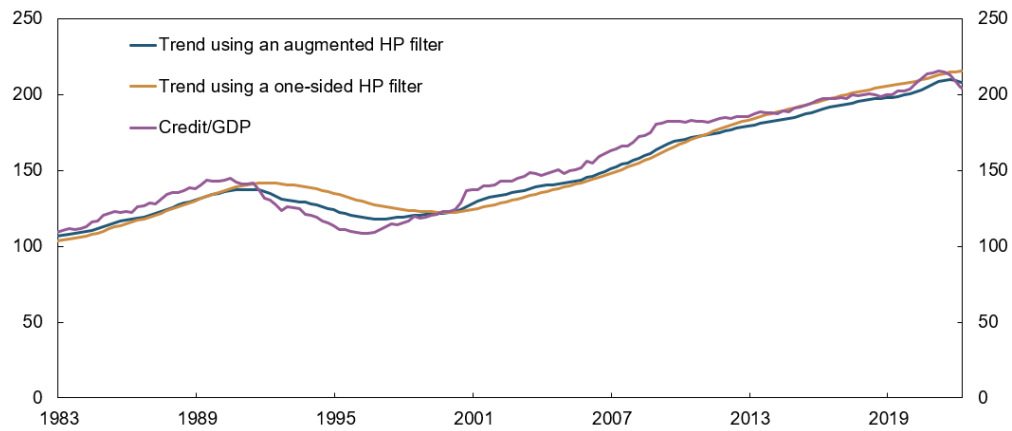
Source: Norges Bank

Chart 1.9 Total banking sector lending
Share of mainland GDP. Decomposed. Percent. 1987 – 2021



Sources: Statistics Norway and Norges Bank

Chart 1.10 Trend¹⁾ in total credit
Estimated trends for total credit as a share of mainland GDP. Percent.
1983 Q1 – 2022 Q1

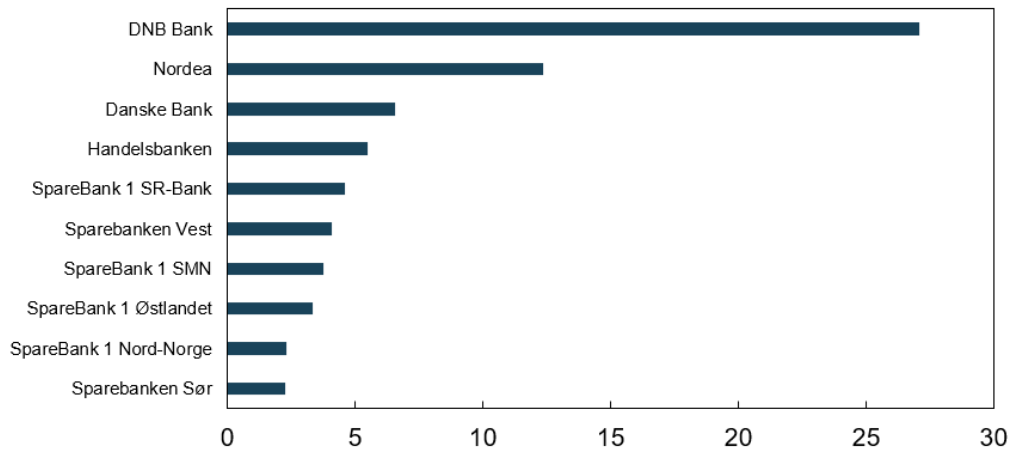


1) One-sided Hodrick-Prescott filter with $\lambda = 400\,000$ and same filter estimated on data augmented with a simple projection.

Sources: IMF, Statistics Norway and Norges Bank

Chart 1.11 Largest banks' market shares

Market shares of the largest banks¹⁾ in Norway. Gross retail and corporate lending. Percent. 2022 Q1

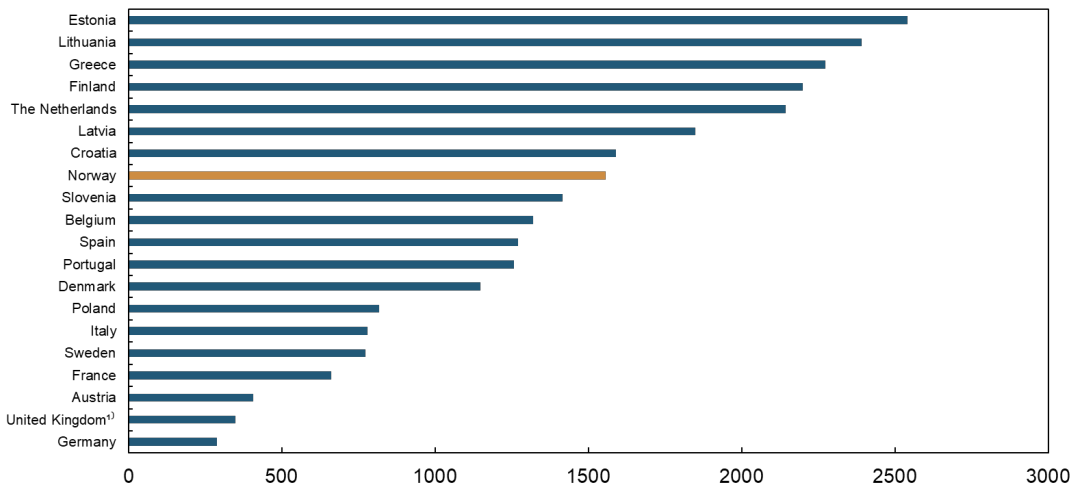


1) Including associated mortgage companies.

Source: Norges Bank

Chart 1.12 Concentration index for banking markets in selected countries

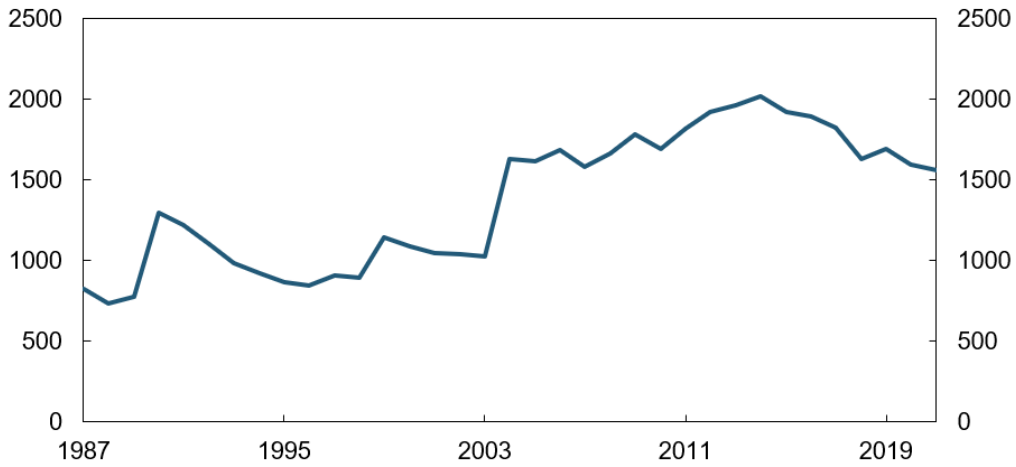
Herfindahl index.¹⁾ Credit institutions. Based on total assets. 2021



1) The Herfindahl concentration index is the sum of squared market shares of the banks in a country. The index will be 10 000 when a country only has one bank and close to zero when there are a large number of small banks. UK data are from 2019.

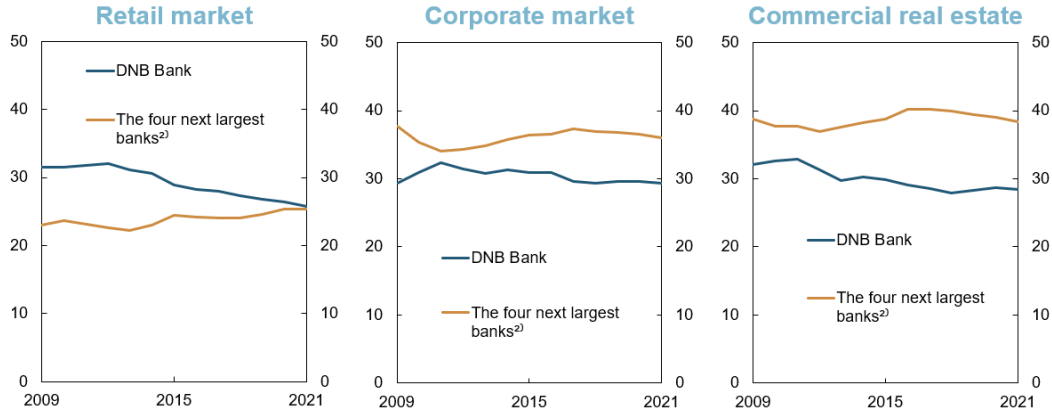
Sources: ECB and Norges Bank

Chart 1.13 Concentration index for the Norwegian banking market
 Herfindahl index.¹⁾ Credit institutions. Based on total assets. 1987 – 2021



1) The Herfindahl concentration index is the sum of squared market shares of the banks in a country. The index will be 10 000 when a country only has one bank and close to zero when there are a large number of small banks. UK data are from 2019.
 Source: Norges Bank

Chart 1.14 The largest banks' lending to selected segments
 Market shares¹⁾. Percent. 2009 – 2021

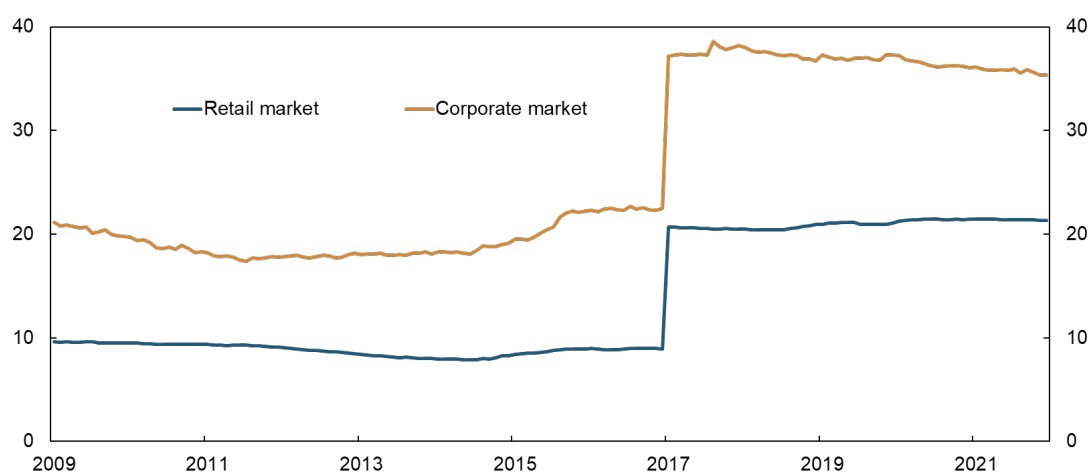


1) Includes mortgage companies.
 2) The four next largest banks are Nordea, Handelsbanken, Danske Bank and SpareBank 1 SR-Bank.
 Source: Norges Bank

Chart 1.15 Branches of foreign banks' market shares in Norway¹⁾

As a share of gross retail and corporate lending. Percent.

May 2009 – April 2022



1) Nordea is included from May 2017.

Sources: Statistics Norway and Norges Bank

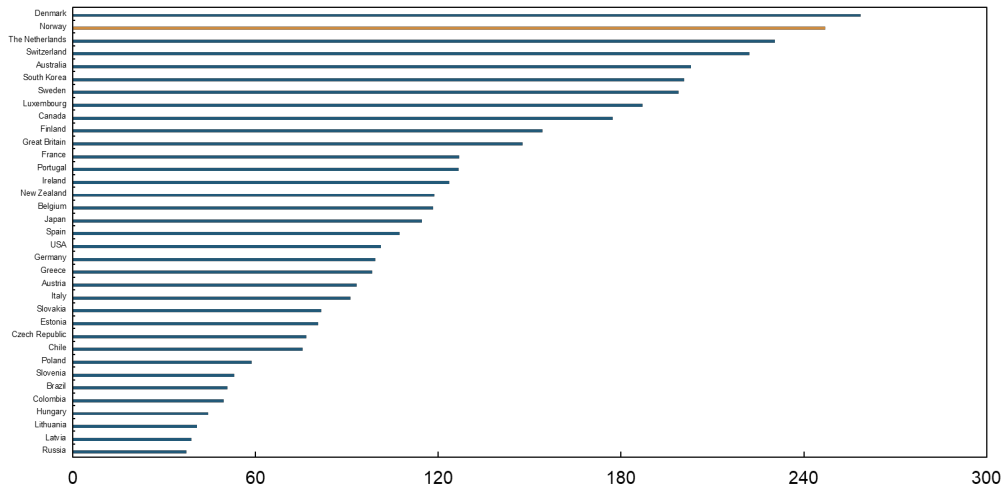
Influence of the real economy on the banking sector

Shocks can be amplified by household and corporate vulnerabilities. Household debt-to-income ratios and the share of variable-rate debt can provide a basis for assessing households' vulnerability to shocks (Charts 1.16 and 1.17). Shocks can be dampened by households' financial buffers (Chart 1.18). Household debt should be viewed in the context of the level of house prices (Chart 1.19). Analyses based on microdata should be used to assess the vulnerability of different household groups.

Total corporate debt provides a general indication of how vulnerable firms are to shocks (Chart 1.20). However, total debt can underestimate the level of vulnerability, and more detailed data, such as bank debt by sector, should therefore be examined (Chart 1.21). Large property exposures can also be assessed by, for example, comparing banks' exposures in Norway with other countries (Chart 1.22) and Norwegian banks' exposures to different types of commercial real estate (Chart 1.23). The exposures should be viewed in the context of commercial property price levels (Chart 1.24).

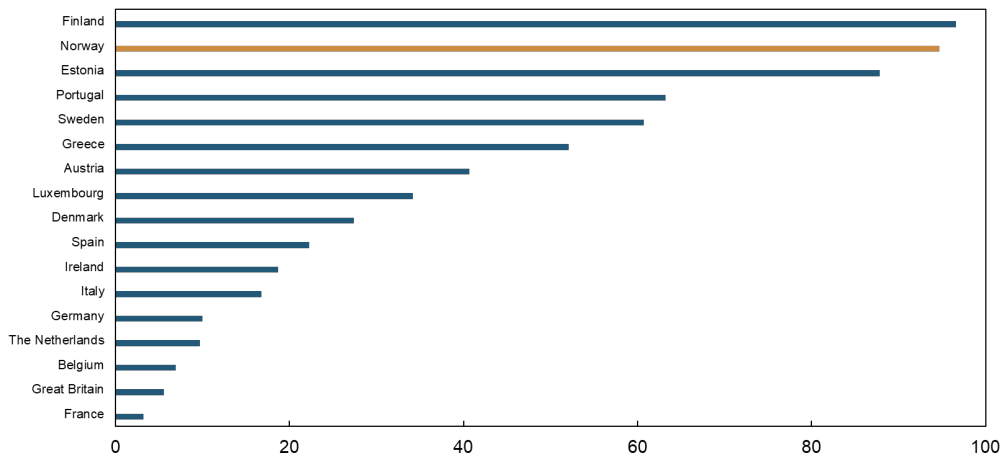
Structural features of the Norwegian economy and interactions with other countries are also important for assessing vulnerabilities. Total external assets and liabilities can provide a basis for assessing financial interactions with other countries and vulnerabilities related to external shocks (Chart 1.25). Norway's uniform industry structure and substantial terms-of-trade volatility provide an indication of vulnerability to the economic outlook (Charts 1.26 and 1.27). The volume, and the concentration of, exports can also amplify this vulnerability when specific shocks occur (Charts 1.28 and 1.29).

Chart 1.16 Household debt in selected countries
Debt as a share of disposable income. Percent. 2020



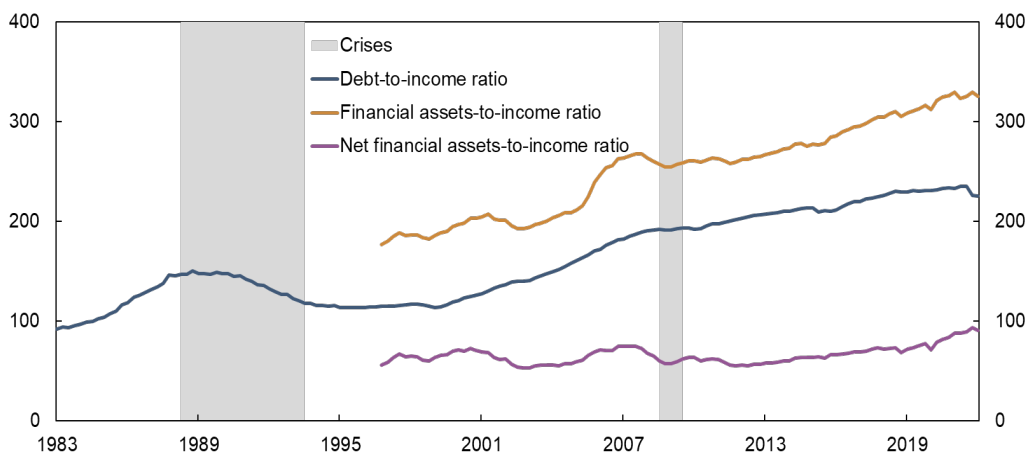
Source: OECD

Chart 1.17 Households' variable-rate debt
Variable-rate loans as a share of total residential mortgage lending. Percent. December 2021



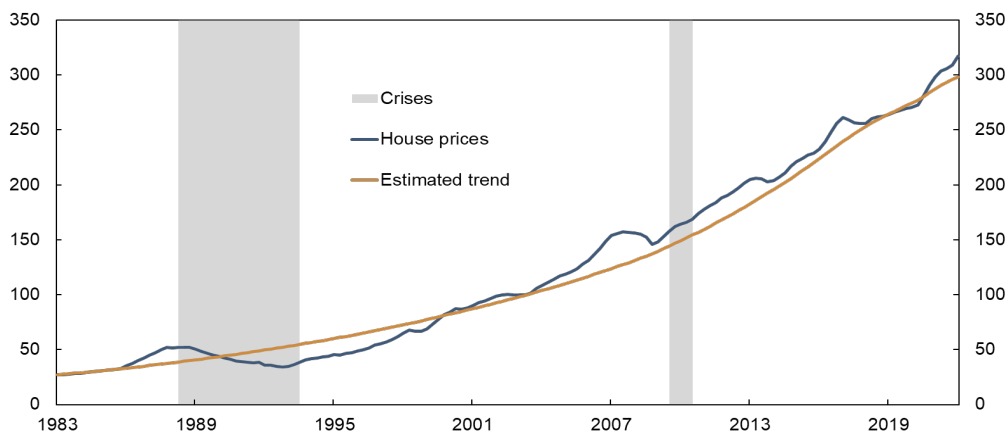
Source: ESRB

Chart 1.18 Household debt-to-income ratio¹⁾, financial assets-to-income ratio²⁾, and net financial assets-to-income ratio
Percent. 1983 Q1 – 2022 Q1



1) Loan debt as a share of disposable income.
 2) Financial assets as a share of disposable income.
 Sources: Statistics Norway and Norges Bank

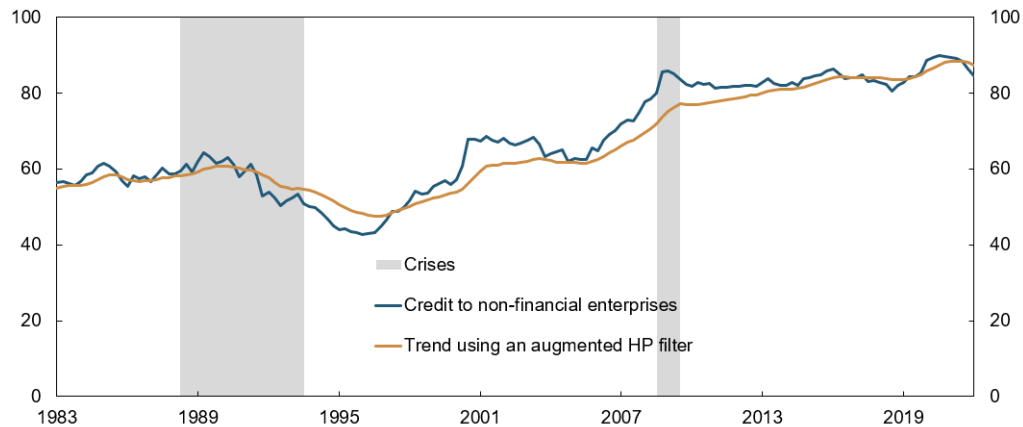
Chart 1.19 House price trend
Index. January 2003 = 100. 1983 Q1 – 2022 Q1



Sources: Eiendomsverdi, Finn.no, Norwegian Association of Real Estate Agents (NEF), Real Estate Norway, Statistics Norway and Norges Bank

Chart 1.20 Trend in credit to non-financial enterprises

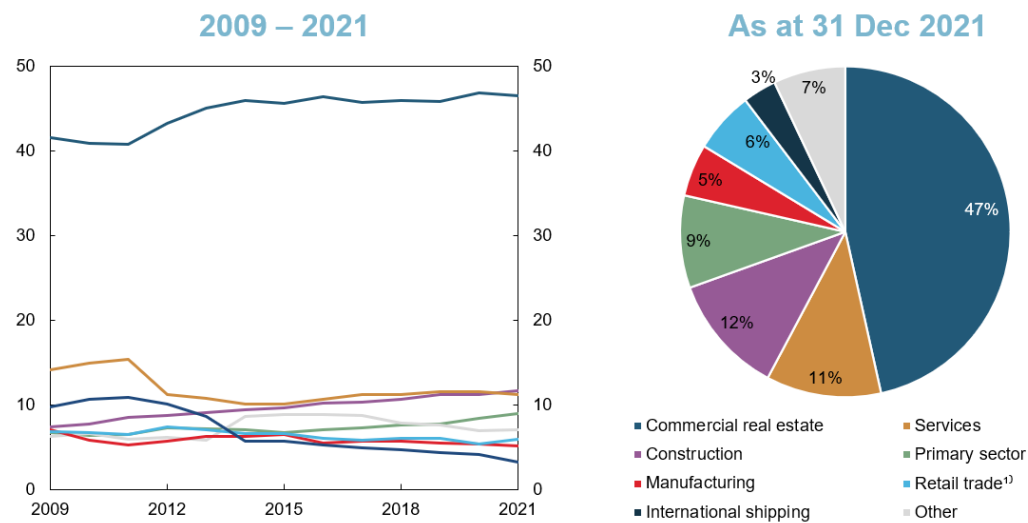
Total corporate credit as a share of GDP for mainland Norway. Percent. 1983 Q1 – 2022 Q1



Sources: Statistics Norway and Norges Bank

Chart 1.21 Bank lending to non-financial enterprises

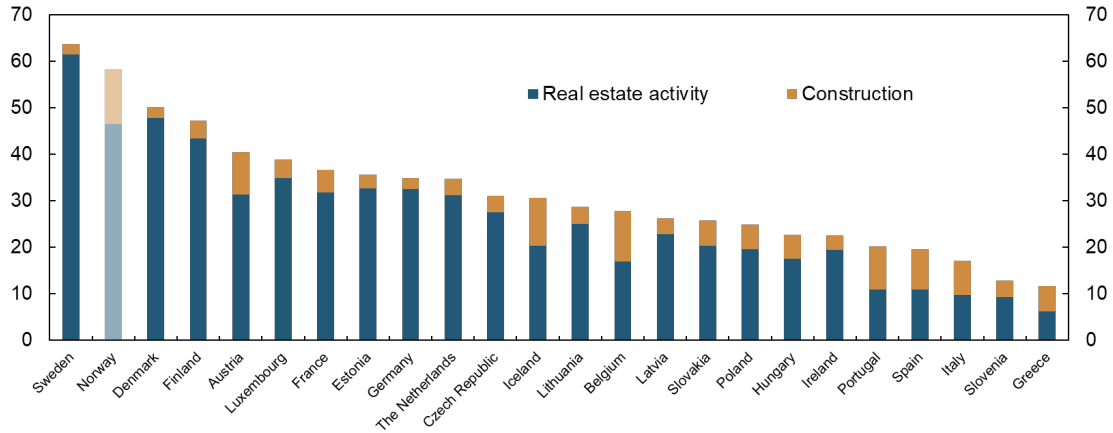
All Norwegian banks and mortgage companies. Percent



1) Retail trade also includes hospitality.

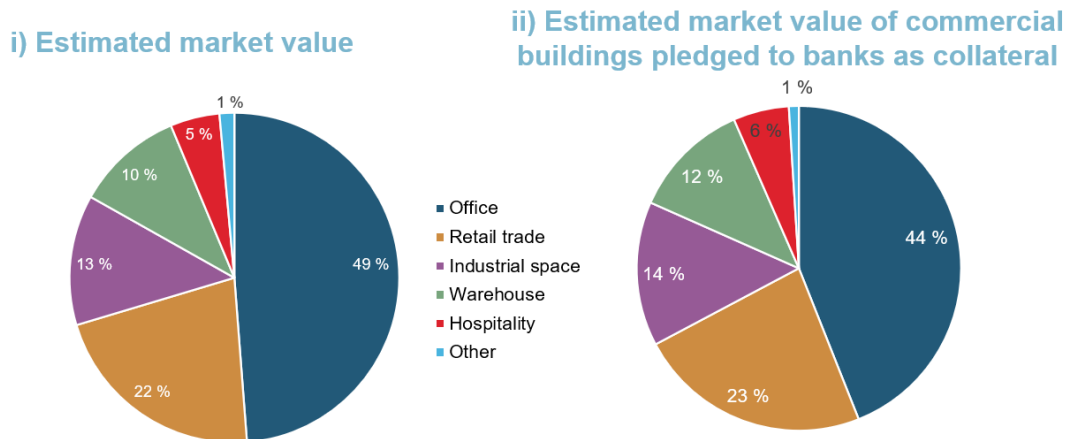
Source: Norges Bank

Chart 1.22 Banks¹⁾ commercial real estate and construction exposures
 As a share of total exposures to non-financial enterprises. Percent.
 December 2021



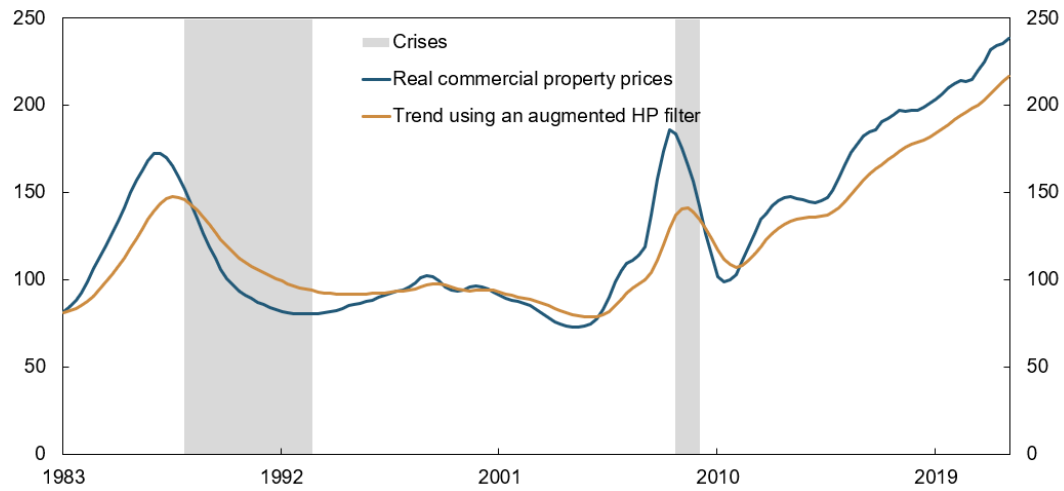
1) Sample of 183 European banks.
 Sources: EBA Risk Dashboard and Norges Bank

Chart 1.23 Estimated market value of commercial buildings by segment
 Percent. 2022



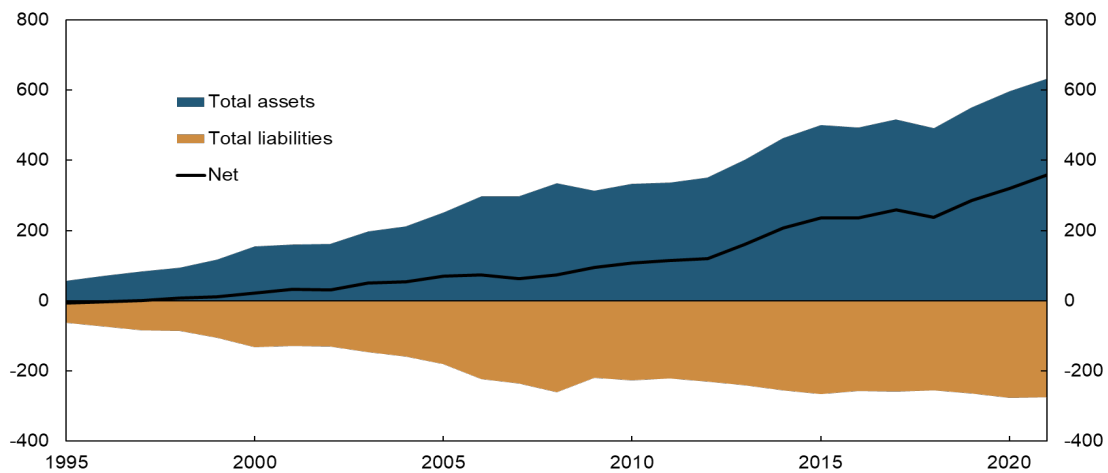
Sources: Arealstatistikk, Create-Solutions, Newsec, Statistics Norway and Norges Bank

Chart 1.24 Real commercial property prices
 Prime real estate in Oslo. Index. 1998 = 100. 1983 Q1 – 2022 Q1



Sources: Dagens Næringsliv, JLL, OPAK, Statistics Norway and Norges Bank

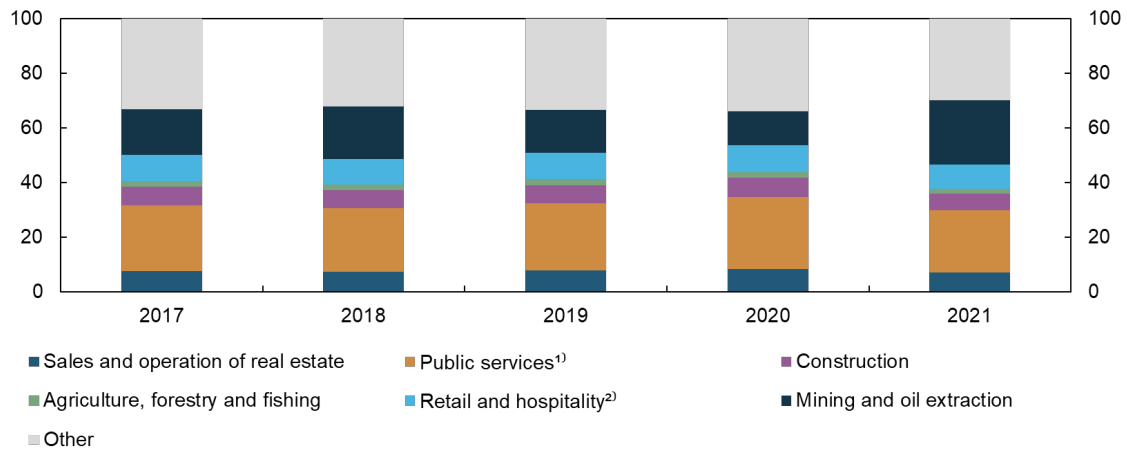
Chart 1.25 External assets and liabilities
 As a share of GDP for mainland Norway. Percent 1995 – 2021



Source: Statistics Norway

Chart 1.26 Value added by sector

As a share of total value added. At basic prices. Percent. 2017 – 2021



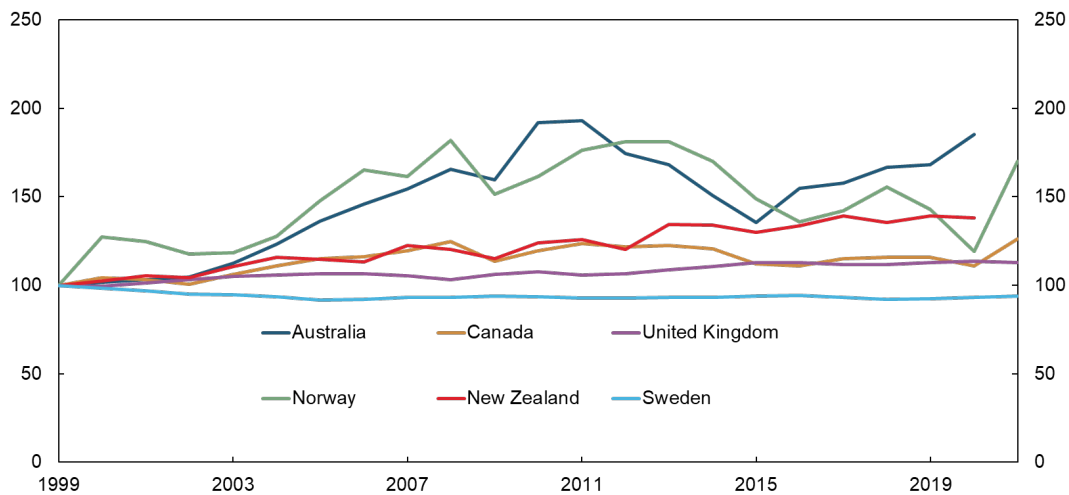
1) Includes public administration and defence, nursing and care services, day care and after-school programmes, education, health services, and water supply, sewerage and waste.

2) Also includes auto repair.

Source: Statistics Norway

Chart 1.27 Terms of trade

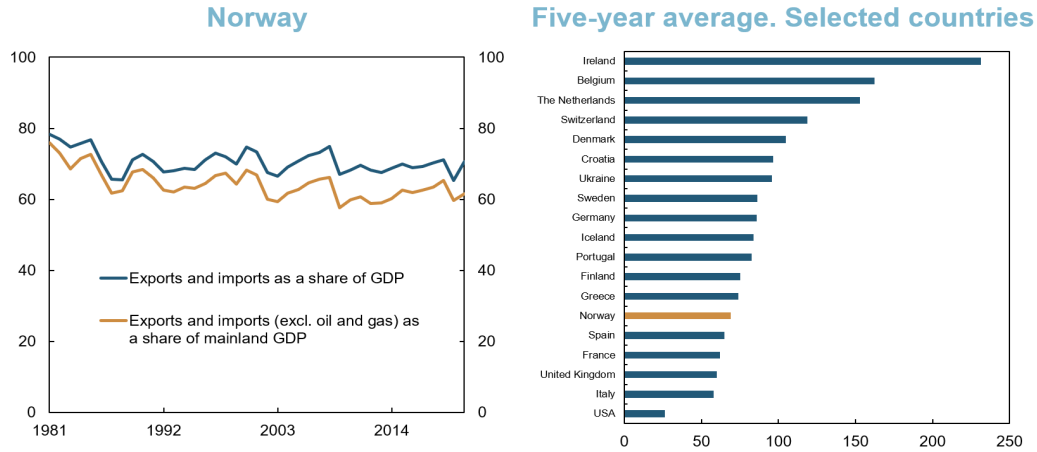
Ratio of export to import prices. Index. 1999 = 100. 1999 – 2021¹⁾



1) Data for Australia and New Zealand up to end-2020.

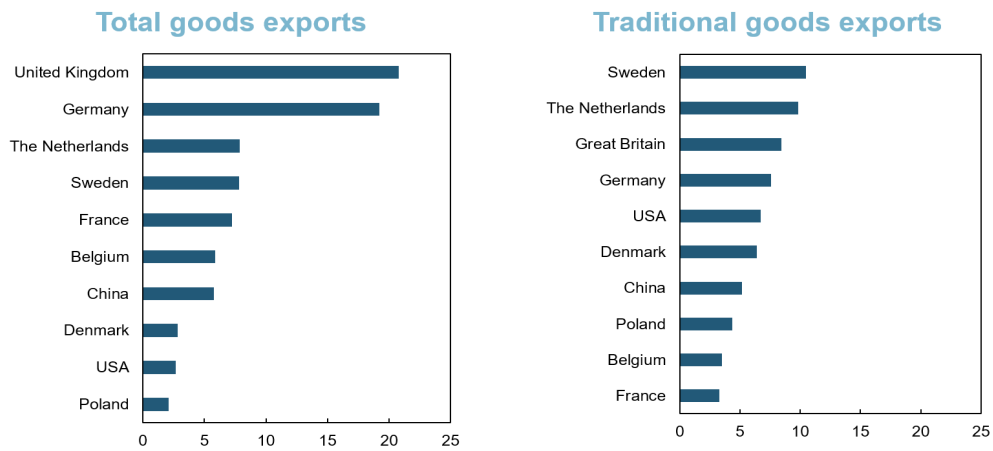
Sources: OECD and Norges Bank

Chart 1.28 Exports and imports as a share of GDP
 Total exports and imports as a share of GDP. Percent.
 1981 – 2021 and average for 2015 – 2020



Source: Statistics Norway

Chart 1.29 Geographical distribution of exports
 Market shares. Ten largest exporters. Percent. 2021



Source: Statistics Norway