

DANMARKS NATIONALBANK

12 NOVEMBER 2018 — NO. 16

DISCUSSION PAPER FOR MACROPRUDENTIAL POLICY CONFERENCE

While the sun is shining, prepare for a rainy day

The financial crisis ten years ago brought large costs to society and – as a consequence – an increase in policymakers' focus on risks to the financial system as a whole and how to prevent and mitigate them, i.e. macroprudential policy. This paper gives an overview of key features of the Danish financial system and points to current macroprudential policy challenges.



Timely and sufficient action or an overly cautious approach?

In a world of uncertainty, decision-makers run the risk of either reacting to potential vulnerabilities that never materialise or failing to react, which could ultimately result in a crisis.



How to avoid deregulation in times of optimism?

The benefits of regulation are difficult to prove while the immediate impact on borrowers and lenders is concrete. As crisis memories fade, complacency emerges.



What is macroprudential policy not?

There may be a risk of excessively burdening macroprudential policies with addressing the symptoms of too much risk taking vis-à-vis addressing the causes by means of fiscal, tax and structural policies.

Financial crises are expensive and affect the overall economy and welfare. Dosed correctly, prudential measures may reduce the likelihood and depth of such crises – but to what extent and how to dose? The paper sets the stage for a topical discussion of those questions in a Danish context at the macroprudential policy conference 19 November 2018 ([link](#)).

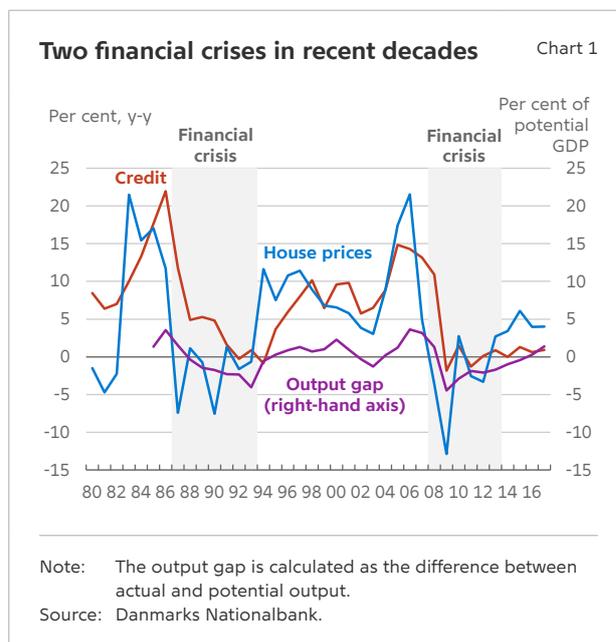
The economic costs associated with systemic financial crises are significant and in Denmark, the economic downturn in 2007-09 was the most severe since World War II. Some estimates indicate that total output loss was 12 per cent of gross domestic production, GDP, in the five years after the outbreak of the crisis.¹ This is in line with the academic findings that cyclical downturns in the wake of financial crises are more severe and more prolonged than cyclical downturns related to non-financial crises.²

As the crisis unfolded, the Danish government took several comprehensive measures, including a guarantee of around 250 per cent of GDP. The guarantee covered bank depositors and other unsecured creditors. Other measures included a government capital injection scheme as well as establishing a winding-up company, the Financial Stability Company, to handle distressed deposit banks. Also, Danmarks Nationalbank expanded central bank loan facilities. The purpose of these measures was to safeguard the stability of the financial system to prevent the downturn and international financial turmoil from aggravating a potential credit crunch.

In the aftermath of the crisis, the importance attached to prudential measures at the macrolevel – macroprudential policy – has moved up on the political and research agendas. The aim is to better take into account in regulation that vulnerabilities may build up across the system even though individual institutions or lending contracts may

appear sound and stable on a stand-alone basis.³ The objective may be to prevent excessive build-up of risk or to make the financial sector more resilient and limit contagion effects.⁴

Today's key challenge is to react to potential new risks that may take other forms than seen earlier. Now, ten years after the financial crisis the Danish economy is in a balanced upswing. Aggregate credit growth is moderate, cf. Chart 1, but there are signs of risk build-up in the current environment of low interest rates, optimism and high competition. Signs include continued property price increases in the cities, high lending growth combined with easing of credit standards among medium-sized banks, and a higher share of lending to vulnerable customers. As a small open economy with a highly integrated financial sector, Denmark is vulnerable to external shocks. Hence, the risk outlook is also affected by the limited scope in large economies for monetary and fiscal crisis response in the next downturn.



1 See The Committee on the causes of the financial crisis, The financial crisis in Denmark – causes, consequences and lessons (the "Rangvid report"), September 2013.

2 See Oliver Grinderslev Juhler, Paul Lassenius Kramp, Anders Farver Kronborg, and Jesper Pedersen, Financial cycles: What are they and what do they look like in Denmark?, *Danmarks Nationalbank Working Paper*, No. 115, June 2017.

3 See e.g. Gianni De Nicolò, Giovanni Favara, and Lev Ratnovski, Externalities and macroprudential policy, *IMF Staff Discussion Note*, SDN/12/05, June 2012.

4 See ESRB, Recommendation on the macro-prudential mandate of national authorities, ESRB/2011/3, December 2011, or ECB's website on Financial stability and macroprudential policy.

In the following we provide an overview of key features of the Danish financial system and relevant prudential initiatives taken to date. A short overview of the institutional set-up in Denmark will be followed by a presentation of the financial system and relevant initiatives. The presentation is structured along four dimensions that may involve systemic risks. The dimensions are formulated as intermediate objectives by the European Systemic Risk Board, ESRB, and the Danish Systemic Risk Council⁵: 1. mitigate and prevent excessive credit growth and leverage, 2. mitigate and prevent excessive maturity mismatch and market illiquidity, 3. limit risks related to exposure concentrations, and 4. limit the systemic risks connected with systemically important institutions and reduce misaligned incentives. Finally, we discuss current macroprudential policy challenges.

Institutional set-up

Establishing an institutional framework for macroprudential policy has been undertaken internationally as well as nationally. The ESRB was established at the EU level in 2010. In the following years, most EU member states also established national institutional set-ups for macroprudential policy.

In Denmark, the macroprudential authority is the Danish Systemic Risk Council. The Council comprises independent experts and top management representatives from Danmarks Nationalbank, the Danish Financial Supervisory Authority, the Ministry of Industry, Business and Financial Affairs, the Ministry for Economic Affairs and the Interior, and the Ministry of Finance. The Council is chaired by the Governor of Danmarks Nationalbank, and the central bank hosts the secretariat services with participation of the other authorities. The Council was established in 2013.⁶

The Council monitors financial system risks and may issue recommendations on a “comply-or-explain” basis. The Council serves as a forum for discussions of potential systemic risks based on a comprehensive and systematic analytical foundation. The Council issues a press release after each meeting, summarising the Council’s risk assessment and outlining central discussions. The Council may issue formal statements with varying degree of strength and has, in total, issued two observations, one warning and seven recommendations.⁷ The recommendations concerned, inter alia, imposing additional capital requirements for systemically important financial institutions, restricting mortgage loans with deferred amortisation and activating the countercyclical capital buffer. The Council’s mandate also extends to Greenland, and – concerning banks – to the Faroe Islands. The Minister of Industry, Business and Financial Affairs is the designated authority as defined in EU legislation.

Key features of the Danish financial system

1: Credit growth and leverage in a Danish context

While Danish households on aggregate have positive net wealth, gross debt ranks among the highest in the world. Strong balance sheet expansion over the last decades, cf. Chart 2, has resulted in record-high household debt by international comparison. The very large pension wealth and asset holdings reduce the households’ need to be debt-free when they retire. Also, an extensive social safety net and a high level of public service reduce the risk that households are unable to service their loans. Nevertheless, there is emerging evidence that high gross debt may result in households cutting back consumption more, even if they continue to service their debt.⁸

The Danish experience of high growth in property prices and credit prior to the last two financial crises confirms the lessons from the literature. Studies

5 The Danish Systemic Risk Council have slightly modified the ESRB intermediate objectives, see Danish Systemic Risk Council, Monitoring of systemic risks, December 2014 and European Systemic Risk Board, Recommendation on Intermediate Objectives and Instruments of Macroprudential Policy, ESRB/2013/1, April 2013.

6 Information about the Council is available here ([link](#)).

7 Press releases and formal statements are available at the Council’s website.

8 See Asger L. Andersen, Charlotte Duus, and Thais L. Jensen, Household debt and spending during the financial crisis: Evidence from Danish micro data, *European Economic Review*, Vol. 89, 2016, and Bank of England, *Financial Stability Report*, June 2014.

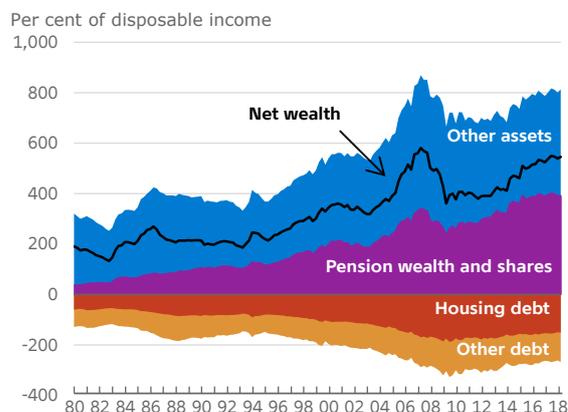
Intuition behind mitigating and preventing excessive credit growth and leverage¹ Box 1

Credit to firms and households is of significant importance to the real economy as it facilitates investments and consumption smoothing. In times of economic growth, increased optimism may, however, generate increased risk appetite or risk illusion among borrowers and lenders and result in too loose credit standards and rapid credit growth. Such procyclical behaviour of borrowers and lenders is an externality in the financial system as agents do not necessarily take into account how their behaviour collectively affects the entire system.

Widespread risk taking will thus lead to excessive credit growth and leverage, making credit institutions and borrowers more vulnerable to unexpected, negative events with potential systemic consequences. For example, a modest loss on loans to households and firms could lead to a considerable reduction in bank equity and induce banks to cut back on lending activities as a means of adjusting balance sheets. The corresponding reaction for households could be a widespread cutback in consumption with aggravating implications for economic activity.²

1. The intuition is further described in Danish Systemic Risk Council, Monitoring of systemic risks, December 2014, and European Systemic Risk Board, Recommendation on intermediate objectives and instruments of macroprudential policy, ESRB/2013/1, April 2013.
2. See Lucia Alessi and Carsten Detken, Identifying excessive credit growth and leverage, *ECB Working Paper Series*, No. 1723, August 2014.

Strong balance sheet expansion in recent decades Chart 2



Note: Quarterly frequency. Pension wealth after tax, where the tax rate is assumed to 40 per cent. Housing wealth does not include farmland, commercial property owned by the household sector, cooperative housing and undeveloped land. The audit of the national accounts entails data break in the 4th quarter of 2012. The disposable income is corrected for data breaks back in time and excludes extraordinary tax revenue from the conversion of capital pensions in 2013-14 and high PAL tax revenue in 2014.

Source: Danmarks Nationalbank.

have found that asset price booms fuelled by credit growth tend to increase the risk of a crisis and to be followed by deeper recessions and slower recoveries.⁹ In Denmark, an overheating economy, surging property prices and yearly credit growth exceeding 15 per cent characterise both recent crisis episodes. And while property prices took a large correction during the crises, credit levels stayed roughly the same. Today, the debt level totals 225 per cent of GDP for households and the non-financial sector.

The Danish economy is now in a balanced upswing with signs of risks building up. The economy is ex-

periencing one of the longest periods of continuous growth, and it has taken place without considerable imbalances building up in the real economy. However, despite moderate aggregate credit growth, there are signs of increasing financial risks. Prices of residential and commercial properties continue to rise, while the growth rate for owner-occupied flats (primarily located in Copenhagen) has slowed down recently, cf. Chart 3. Modest growth in total lending covers substantial differences across institutions, regions and industries. Driven by intensified competition for customers, a number of banks have eased credit standards and granted a higher share of lending to vulnerable customers.

⁹ See Òscar Jordà, Moritz Schularick, and Alan M. Taylor, Leveraged bubbles, *Federal Reserve Bank of San Francisco Working Paper*, No. 10, August 2015.

Policy initiatives

Over the last decade, Denmark has taken several policy initiatives to mitigate and prevent excessive credit growth and leverage, cf. Table 1. This includes capital measures, credit growth measures and borrower-based measures.

The countercyclical capital buffer has been activated and increased to 1 per cent effective September 2019. The decisions to activate and increase the buffer were taken in March 2018 and in September 2018. The changes follow recommendations from the Danish Systemic Risk Council that put emphasis on the importance of building up the buffer timely and gradually. Hence, drivers of building up the buffer are a broad range of cyclical risk factors.¹⁰ The Council expects to recommend a further increase of the buffer rate by 0.5 percentage point in the 1st quarter of 2019 unless the risk build-up in the financial system slows down considerably.

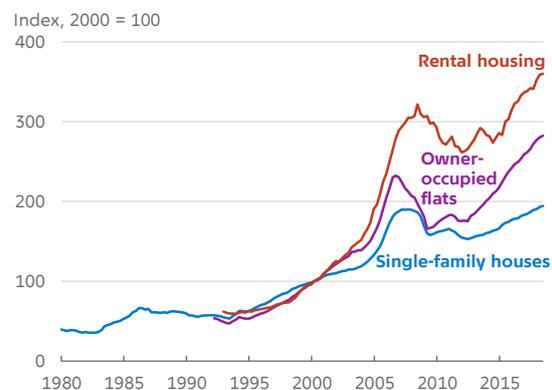
In the Faroe Islands, the systemic risk buffer has been introduced and is being phased in to 3 per cent in 2020. The use of the buffer is aimed at increasing the Faroese banks' resilience to structural risks in the Faroe Islands. These risks arise because the Faroese economy is small and open with a concentrated business structure. The economy is therefore vulnerable to negative shocks, which could lead to large, unexpected losses for the banks.

Benchmarks for maximum annual credit growth have been introduced in Denmark. For mortgage banks, the guidelines apply to each lending segment whereas they are applied at the aggregate level for deposit banks. Mortgage banks differ from deposit banks by only providing lending secured by real estate, financed by issuing covered bonds that are subject to specific LTV limits.

Direct borrower-based measures have been introduced since 2013. For homeowners, measures include a down payment requirement of minimum 5 per cent, specific net wealth requirements for lending at debt-to-income, DTI, levels above 4, and interest rate and amortisation stress testing of households' repayment capacity. For property rental, a positive cash flow

Continued real estate price increases among the signs of risks building up

Chart 3



Note: Rental housing comprises prices of buildings with at least four apartments for commercial use. Nominal prices.
Source: Statistics Denmark and own calculations.

is required as a starting point for deposit banks to provide loans.

¹⁰ See Danish Systemic Risk Council, Increase of the countercyclical capital buffer rate, Recommendation, September 2018.

Objective 1: Policies to mitigate excessive credit growth and leverage

Table 1

Year of decision	Danish initiatives	Main macroprudential effect
Capital-based measures		
2018	The <i>countercyclical capital buffer</i> activated at the rate of 0.5 per cent as of 31 March 2019, and increased to 1 per cent as of 30 September 2019.	Increases resilience of credit institutions.
2017, 2018	The <i>systemic risk buffer</i> is introduced in the Faroe Islands and is being phased in to a level of 3 per cent from 2018-20.	
Credit growth measures		
2014	Limit on mortgage banks ¹ lending growth to each lending segment of 15 per cent per year. The lending segments are: private homeowners, property rental, agriculture and other corporates. Effective as of 2018.	Limits incentives for too loose credit standards by limiting excessive credit growth.
2010	Limits on deposit banks' <i>lending growth</i> to less than 20 per cent per year.	
Borrower-based measures		
2017	Lending restriction for households with a debt-to-income, DTI, greater than 4 and loan-to-value, LTV, greater than 60 per cent: (a) the interest rate fixation of floating-rate mortgages needs to be at least 5 years, and (b) deferred amortisation is only an option on 30-year fixed-rate loans. Effective as of 2018.	Ensures minimum credit standards, dampens borrowers' short-term purchasing capacity and increases their resilience.
2016	Areas with high property price growth and price levels (Copenhagen area and Aarhus): Homebuyers subject to higher interest rate stress test and – if <i>debt-to-income</i> , DTI, levels are above 4 – specific net wealth requirements. Effective as of 2016.	Dampens feedback loop through minimum credit standards and increases borrowers' resilience.
2015	Homebuyers are required to make a minimum down payment of 5 per cent when purchasing a home. Effective as of 2015.	Ensures borrowers' resilience.
	Lending against rental properties as collateral may only take place if the property generates <i>positive cash flow</i> . Effective as of 2015.	Dampens feedback loop through minimum credit standards and increases borrowers' resilience.
2014	Benchmark for borrowers' <i>interest rate risk</i> . Mortgage banks ¹ lending where the interest rate is fixed for less than 2 years and where the LTV exceeds 75 per cent of the LTV limit ² should be less than 25 per cent of total lending. Applies to lending to private homeowners and property rental. Effective as of 2018.	Dampens feedback loop through minimum credit standards and increases borrowers' resilience.
	Benchmark for <i>deferred amortisation</i> . The share of mortgage banks' deferred amortisation lending in the LTV band above 75 per cent should be less than 10 per cent of total lending. Applies to private homeowners. Effective as of 2020.	Increases resilience of credit institutions.
2012	Household <i>repayment capacity stress test</i> : Borrowers must be able to service a 30 year fixed interest rate and amortisation loan irrespective of the chosen loan type. Effective as of 2013.	Dampens feedback loop through minimum credit standards and increases borrowers' resilience.

Note: Measures specific to Denmark, i.e. measures implemented according to EU legislation, are not included.

Source: Danish Financial Supervisory Authority and Ministry of Industry, Business and Financial Affairs.

- The bulk of lending against real estate in Denmark is provided through mortgage banks. Mortgage banks do not take deposits but finances mortgage lending by issuing covered bonds that are subject to specific LTV limits.
- The LTV limits for the covered bonds mortgage banks issue are: residential property 80 per cent, agricultural property 70 per cent, office, shop and industrial property 60 per cent.

2: Maturity mismatch and market illiquidity in a Danish context

The Danish financial system today is characterised by deposit surplus and limited reliance on short-term funding, in contrast to the pre-crisis situation, cf. Chart 4. Today, the deposit surplus amounts to approximately kr. 200 billion, or 10 per cent of GDP.

A key feature of the system is the high reliance on mortgage bonds for liquidity management. The stock of covered bonds was equivalent to 130 per cent of GDP by mid-2018 – nearly four times larger than the Danish government debt market. Studies show that Danish benchmark-covered bonds – by and large – have been as liquid as Danish government bonds, including in periods of market stress.¹¹ Liquidity is affected by the properties of the mortgage bonds, including series size and creditworthiness, making confidence in the system and high creditworthiness of the bonds essential for maintaining liquidity.

Foreign ownership particularly of long-term mortgage bonds has increased in recent years. The share of foreign-owned mortgage bonds has increased since the beginning of the decade, and in recent years demand has been particularly notable for long-term bonds. Foreign ownership now exceeds 20 per cent of the total market and exceeds 30 per cent of long-term bonds. The greater demand from foreign investors is a result of, inter alia, asset purchase programmes of large economies' central banks which have crowded out investors in government bond markets, thereby increasing demand for other assets.

Policy initiatives

Soon after the crisis, liquidity and funding measures were introduced in Danish regulation, cf. Table 2. In 2010, benchmarks for banks' funding and liquidity coverage were introduced as part of the Supervisory Diamond for banks. In 2017, the benchmark for liquidity coverage was updated to incorporate the LCR.

Specific measures have been introduced for mortgage banks to address maturity mismatch. First, a

Intuition behind mitigating and preventing excessive maturity mismatch and market illiquidity¹

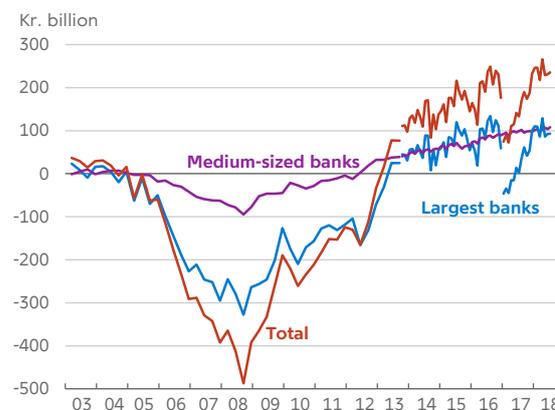
Box 2

If long-term lending is financed excessively by short-term loans or market-based funding, credit institutions may come under pressure to reduce their balance sheets if access to financing becomes difficult (market illiquidity). If liquidity reserves are not sufficient to withstand such a situation, a forced sale of assets could be the result. This may lead to a fire sale spiral (externality) whereby falling asset prices induce further sales, deleveraging and spillovers to financial institutions with similar asset classes. Ultimately, this may impede credit institutions' ability to provide loans to households and firms with an adverse effect on the real economy.

1. See Box 1 for references.

Pre-crisis deposit deficit turned to surplus

Chart 4



Note: Deposit surplus of banks. Mortgage banks are not included as they are not deposit takers. Data break in 2017 as Nordea Bank Danmark became a branch of Swedish-based Nordea AB.

Source: Danmarks Nationalbank.

11 See Jens Dick-Nielsen, Jacob Gyntelberg, and Thomas Sangill, Liquidity in government versus covered bond markets, *Danmarks Nationalbank Working Paper*, No. 83, November 2012.

Objective 2:

Table 2

Policies to mitigate and prevent excessive maturity mismatch and market illiquidity

Year of decision	Danish initiatives	Main macroprudential effect
Capital-based measures		
2014	<p>Benchmark for mortgage banks' <i>short term funding</i>: The share of loans that is refinanced should be less than 25 per cent of total loans annually and less than 12.5 per cent of total loans for each quarter. Effective as of 2020.</p> <p><i>Contingent maturity extension</i> for mortgage bonds with shorter maturities than the underlying loans implemented in the legislation governing mortgage bonds. Fully effective as of 2015.</p>	Reduces systemic implications of temporary mortgage bond market turmoil.
2010	<p>The <i>funding ratio</i> for banks should be less than 1. The ratio is defined as lending divided by the sum of deposits, issuances with more than 12 months to maturity, subordinated debt, and equity. Effective as of 2012.</p> <p>Banks excess <i>liquidity coverage</i> larger than 50 per cent compared to the statutory requirement. Effective as of 2012. As of June 2018, banks have to comply with an LCR-based liquidity benchmark.</p>	<p>Reduces risk of credit squeeze due to funding difficulties.</p> <p>Reduces risk of liquidity squeeze.</p>

Note: Measures specific to Denmark, i.e. measures implemented according to EU legislation, are not included.

Source: Danish Financial Supervisory Authority and Danmarks Nationalbank.

benchmark for the share of mortgage banks' short-term funding was introduced. Second, provisions for contingent maturity extension for mortgage bonds with shorter maturities than the underlying loans were introduced in the regulation governing the issuance of mortgage bonds in 2014. The extension takes effect if a refinancing auction fails, or if the interest rate on mortgage bonds with an original maturity of less than 2 years rises by more than 5 percentage points within one year.

3: Exposure concentration in a Danish context¹²

Property-related exposures played an important role during the last two Danish financial crises. Many of the failing banks in both crises were characterised by, inter alia, large property-related exposures.¹³ Banks' write-downs were high, in particular for exposures to the building and construction sector. Mortgage banks also experienced substantial write-downs following the crisis in the late 1980s, but less so in the recent financial crisis.

Danish financial institutions are still highly exposed to the real estate market. Credit institutions' total exposures to the real estate sector are in the order of 415 billion euro – more than 140 per cent of GDP – when counting banks' housing lending, lending to the building and construction sector and to the real estate sector, as well as mortgage banks' lending. At the same time, mortgage banks are closely connected to the rest of the financial sector, as other Danish financial institutions hold mortgage bonds as liquidity and wealth management instruments, cf. Chart 5. Hence, a negative shock to the real estate market resulting in deteriorating bond value may be a potential channel for contagion among financial institutions. In contrast, the well-developed system for lending against collateral means that lending by non-banks is limited.

Policy initiatives

Policy initiatives have served to limit highly concentrated exposure in individual credit institutions, cf. Table 3. For deposit banks, there is a benchmark on exposure to commercial property (construction companies and real estate companies) of 25 per cent of total lending. Other initiatives have put cap on large exposures relative to capital. By contrast, mortgage bonds with status as Specialised Debt Obligation as defined in the EU Capital Requirements Regulation are exempt from the large exposure restriction by the Danish Financial Supervisory Authority.

Intuition behind limiting risks related to exposure concentrations¹

Box 3

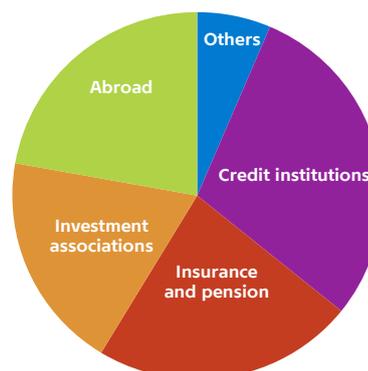
Large exposures to the same kind of customer or among financial institutions make the institutions vulnerable to the same negative events, thereby increasing the risk of a negative shock having systemic implications. This is because the overall effect of the reaction is intensified when multiple credit institutions suffer a simultaneous blow. The potential contagion effects of interconnectedness or common exposures to the same asset class constitute externalities.

¹ See Box 1 for references.

Financial system closely interlinked through Danish mortgage bonds

Chart 5

Holders of Danish mortgage bonds, August 2018



Note: 12-month average.
Source: Danmarks Nationalbank.

¹² The objective formulated by the Danish Systemic Risk Council and the ESRB is to limit exposure concentrations.

¹³ See Kim Abildgren and Jens Thomsen, A tale of two Danish banking crises, *Danmarks Nationalbank Monetary Review*, 1st Quarter 2011.

Objective 3: Policies to limit direct and indirect exposure concentrations

Table 3

Year of decision	Danish initiatives	Main macroprudential effect
2014	Benchmark for <i>large exposures</i> : The sum of mortgage banks' 20 largest exposures must be less than the Common Equity Tier 1 capital. Effective as of 2018.	Reduces risk of systemic impact from highly concentrated exposure.
2010	Benchmark for banks' <i>commercial property exposure</i> to no more than 25 per cent of total lending. Effective as of end-2012. Specific benchmark for <i>large exposures</i> . Effective as of end-2012. Later modified so that the sum of a bank's 20 largest exposures is limited to no more than 175 per cent of Common Equity Tier 1 capital.	Reduces risk of systemic impact from highly concentrated exposure.

Note: Measures specific to Denmark, i.e. measures implemented according to EU legislation, are not included.

Source: Danish Financial Supervisory Authority.

1. See Table 1 for a description of mortgage banks.

4: Systemic institutions in a Danish context¹⁴

The Danish financial sector is characterised by a handful of large credit institutions and multiple small and medium-sized banks, cf. Chart 6. The six large credit institutions identified as SIFIs have a market share of more than 85 per cent of loans in Denmark, and their total balance sheet amounts to almost 280 per cent of GDP. Also the Faroe Islands and Greenland are characterised by a few large credit institutions.

The largest Danish pension companies also have considerable balance sheets. Six pension companies have assets the size of the SIFI banks, totalling 120 per cent of GDP. Pension companies mainly influence the financial system through their activities in the financial markets. Due to the size of the sector, pro-cyclical behaviour by only a part of the sector may have a substantial market impact. Potential introduction of macroprudential tools is under discussion as part of the ongoing revision of the regulatory framework.

Policy initiatives

Danish deposit banks and mortgage banks appointed as SIFIs must comply with an additional capital

Intuition behind limiting the systemic risks connected with systemically important institutions and reducing misaligned incentives¹

Box 4

Some credit institutions are so large and complex that it may have systemic consequences should they experience problems. This type of institution is known as a systemically important financial institution, SIFI. Misaligned incentives refer to a situation where e.g. owners and management of a bank reap the potential gains from assuming high risk but not to the same extent bear the consequences of the losses that may ensue. In such a situation, too much risk may build up in the financial system which may have systemic consequences.

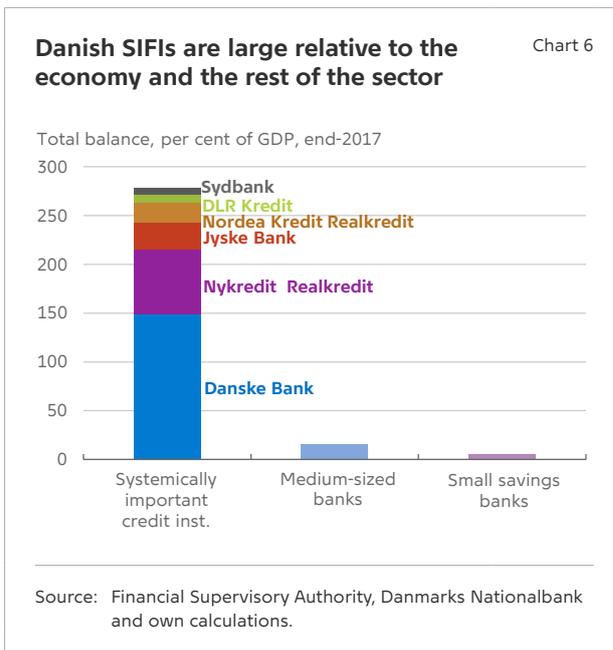
1. See Box 1 for references.

14 Objective as formulated by the Danish Systemic Risk Council. The objective as formulated by the ESRB is to limit the systemic impact of misaligned incentives with a view to reducing moral hazard.

buffer. The SIFI capital buffer is differentiated according to the systemic importance of each institution, cf. Table 4. By 2019, this buffer will range between 1 and 3 per cent of risk-weighted exposures. A similar method is applied for determining SIFI buffer requirements in the Faroe Islands and Greenland resulting in SIFI capital buffers in the range of 1.5-2 per cent.

SIFIs are subject to currency-specific liquidity coverage ratios. The financial crisis showed that refinancing in foreign currencies can be problematic. Accordingly, since 2016, Danish appointed SIFIs have had to fulfil a modified LCR requirement in significant currencies (> 5 per cent of liabilities). Swedish and Norwegian currencies are excluded as liquid DKK assets are also applicable as collateral in Riksbanken and Norges Bank.

Resolution plans have been prepared and a Minimum Requirement for Own Funds and Eligible



Objective 4: Limit the systemic risks connected with systemically important institutions and reduce misaligned incentives

Table 4

Year of decision	Danish initiatives	Main macroprudential effect
2017	One bank appointed as a <i>SIFI in Greenland</i> . It will be subject to an additional capital buffer requirement of 1.5 per cent when fully phased in by 2019.	Higher loss absorption capacity reducing the risk of the need to resolve a SIFI.
2016	<i>LCR requirement in significant currencies</i> (excluding SEK and NOK) applicable to systemically important financial institutions. Fully phased in by October 2017.	Reduced risk of liquidity squeeze for significant currencies.
2015	Three banks appointed as <i>SIFIs in the Faroe Islands</i> . They will be subject to additional capital buffer requirement between 1.5-2 per cent when fully phased in by 2019.	Higher loss absorption capacity reducing the risk of the need to resolve a SIFI.
2014	<i>Several deposit banks and mortgage banks appointed as domestic systemically important financial institutions, SIFIs</i> . As of 2018, the appointed SIFIs are Danske Bank, Nykredit Realkredit, Jyske Bank, Nordea Kredit, Sydbank, and DLR Kredit. ¹ SIFIs are subject to an <i>additional capital buffer requirement</i> between 1-3 per cent of total risk weighted exposures when fully phased in by 2019. ²	Higher loss absorption capacity reducing the risk of the need to resolve a SIFI.

Note: Measures specific to Denmark, i.e. measures implemented according to EU legislation, are not included.

Source: Danish Financial Supervisory Authority, Minister for Industry, Business and Financial Affairs.

- ¹ The Ministry of Industry, Business and Financial Affairs contemplates a change to the criteria for appointing SIFIs. This would imply that Spar Nord bank would be expected to be appointed as SIFI.
- ² The SIFI buffer is implemented by the use of the systemic risk buffer.

Liabilities, MREL, has been set for Danish SIFIs.¹⁵ The resolution strategy for SIFIs is to restructure them and return them to the market with sufficient capital to ensure market confidence. The MREL for the SIFIs has been set based on this strategy. Mortgage banks have been exempted from MREL. Instead, they must meet a debt buffer requirement. It is required that the sum of the debt buffer, own funds and eligible liabilities make up at least 8 per cent of total liabilities and own funds for SIFIs that include a mortgage bank. The debt buffer must be increased if this is necessary in order to meet the 8 per cent minimum requirement.

Current challenges and the way forward

How to secure timely and sufficient action without being overly cautious? In a world of uncertainty, decision makers run the risk either of reacting to potential vulnerabilities that never materialise into a crisis or of failing to react with a crisis as a consequence. The question is equally valid for time-varying instruments like the countercyclical capital buffer as for initiatives of a structural nature that may be designed too loose or restrictive. Methodologies for evaluating the sufficiency of initiatives are still to be developed.

What can be achieved with the countercyclical capital buffer? If the main purpose is to ensure that a sufficient buffer is at hand to be released when credit squeeze is a risk, focus should be on indicators giving sufficiently early warning signals. This may imply a positive buffer rate before systemic risks are evident.

Can the absence of great imbalances be attributed to recent years' initiatives, or should we be ready to tighten further? In addition to the internationally agreed regulatory reforms, a range of initiatives have been introduced in Denmark capping poten-

tial pockets of vulnerabilities. The absence of great build-up of imbalances may or may not be a result of those efforts, at least partially. As many pockets of vulnerabilities are being capped by regulatory initiatives, the role of other policies in containing drivers of risk build-up must be increasingly considered.

What can we do to lean against pressures for relaxing regulation in times of optimism? As crisis memories fade, pressure will arise for relaxing regulatory reforms. The ability of independent macroprudential authorities to withstand such pressures may be greater than for elected politicians, but public understanding of the justification for macroprudential policy should in any case be pursued and kept alive.

How can communication better assist the policy agenda? Communicating macroprudential policy choices can be challenging. Policies may have a complex design, they are to address abstract externalities, and the benefits in terms of reduced tail risks are difficult to prove while the immediate impact on affected borrowers and lenders is concrete.

What is macroprudential policy not? There may be a risk of excessively burdening macroprudential policies with addressing symptoms of too much risk-taking vis-à-vis the role of fiscal, tax and structural policies to address the causes. Or by contrast, the effects of regulatory policies may be diluted by exemptions to accommodate specific distributional considerations that would be better addressed by more direct measures than indirectly through the credit system.

15 See Danish Financial Supervisory Authority, Final resolution plans and MREL for systemically important banks, *Press release*, 28 March 2018, and Danish Financial Supervisory Authority, Endelige afviklingsplaner for Nykredit og DLR og NEP-krav for Nykredit, *Press release*, 31 October 2018 (in Danish only).

ABOUT ANALYSIS



As a consequence of Danmarks Nationalbank's role in society we conduct analyses of economic and financial conditions.

Analyses are published continuously and include e.g. assessments of the current cyclical position and the financial stability.

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This edition closed for
contributions on 6 November
2018

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FINANCIAL STABILITY



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