

DANMARKS NATIONALBANK

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STRESS TEST -2ND HALF 2020

A few banks fall short of capital requirements in stress test



Most banks are resilient to stress

In the most severe stress test scenario, some systemic banks fall short of their capital buffer requirements. However, banks are better capitalised than previously and thereby more resilient to stress. This is partly due to the suspension of dividend payments and share buybacks.



Uncertainty is lower, but considerable risks remain

When Danmarks Nationalbank performed its spring stress test, the outlook was highly uncertain, reflected in historically severe scenarios. Uncertainty has dissipated somewhat, but the risk level remains elevated. The stress test scenarios are more severe than normal, but not quite as severe as in the spring.



Credit register data is now used in stress test

For the first time, Danmarks Nationalbank uses data for individual banks' loan portfolios in its stress test. The credit register data is used to allocate impairment charges more accurately among banks' corporate customers.

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Considerable uncertainty surrounded the outlook for economic growth when Danmarks Nationalbank performed its semi-annual stress test of the largest Danish banks in the spring.¹ Since then, restrictions were gradually lifted, and the Danish economy started to recover.

The outlook is still dominated by the pandemic and its effects. Although uncertainty has dissipated somewhat since Danmarks Nationalbank performed its latest stress test six months ago, it remains higher than normal. This is reflected in the scenarios considered in this stress test. Besides the baseline scenario, which follows Danmarks Nationalbank's most recent economic projection, two recession scenarios are included.² In the most severe of these scenarios, a new downturn starts in early 2021, while in the second recession scenario, the economic downturn commences six months later.

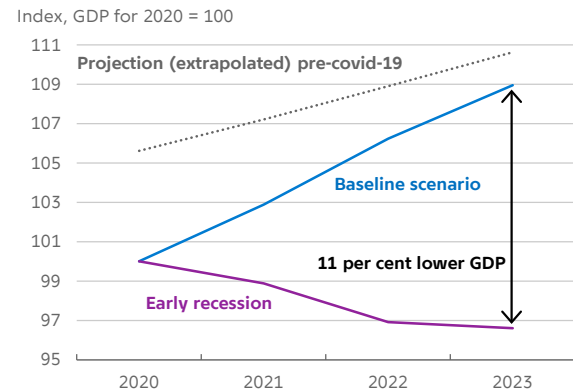
The scenarios should be seen in the context of the preceding economic decline. In the most severe scenario, GDP contracts by 3,4 per cent, but is 11 per cent lower than in the baseline scenario at the end of the stress test period, see Chart 1. If compared with the growth projected before the covid-19 outbreak, the gap is even greater. The scenarios are described in more detail in the final section of the analysis.

The stress test shows that most banks satisfy their capital requirements in the recession scenarios. One reason is that, over the past year, most banks have increased their capital surplus relative to the requirements, e.g. because they have not paid dividends to shareholders or bought back shares in 2020. However, some banks fall short of the capital buffer requirements in the stress test.

The stress test for the 2nd half of 2020 also represents a departure in methodology from earlier stress tests. For the first time, the credit register established by Danmarks Nationalbank and the Danish Financial Supervisory Authority is used for stress

Economy is far from its normal level in recession scenario

Chart 1



Note: The pre-covid-19 projection is Danmarks Nationalbank's economic projection from autumn 2019. This projection covered the period until 2022 but has been extrapolated in the chart, so that the growth rate from 2022 to 2023 is identical to that from 2021 to 2022. The baseline scenario is Danmarks Nationalbank's economic projection from December 2020.

Source: Own calculations.

testing purposes. The credit register contains detailed data on lending by Danish banks. The stress test uses data from the credit register to allocate bank impairment charges among corporate customers, meaning that the banks believed to have the riskiest customers are allocated the highest impairment charges.

¹ See Appendix 1 for an overview of the stress test population.

² Danmarks Nationalbank, Outlook for the danish economy – Spread of coronavirus delays recovery, *Danmarks Nationalbank Analysis*, No. 26, December 2020.

A few banks fall short of capital requirements in early recession scenario

The stress test shows that a few systemic banks fall short of the capital buffer requirements in the early recession scenario, see Chart 2. Overall, systemic banks are about kr. 12.5 billion short of satisfying the buffer requirements.

If a bank's capital ratio falls below its buffer requirements, a number of restrictions will be imposed, for instance in relation to dividend payments and interest payments on hybrid capital instruments. This could further weaken the banks' access to external funding in the financial markets where funding is already difficult to obtain.

Banks are required to meet both minimum capital and buffer requirements, see Chart 3. The requirements shown are risk-based in the sense that capital is calculated as percentages of risk exposure amounts, providing a measure of the riskiness of bank assets. In the stress test recession scenarios, all systemic banks meet their risk-based minimum requirements.

In the 2nd quarter of 2021, a leverage ratio requirement will also be implemented. Banks will be required to maintain a minimum Tier 1 leverage ratio of 3 per cent of their unweighted exposures, i.e. non-risk weighted assets. In the stress test, all systemic banks meet the leverage ratio requirement.

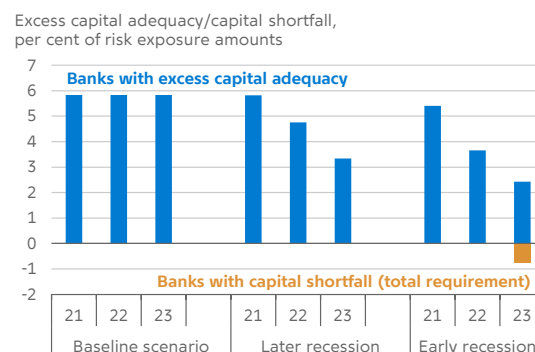
Higher excess capital adequacy, but weaker earnings have opposite effects

As described in the semi-annual analysis of financial stability, banks have strengthened their capitalisation during the past year despite weaker earnings than previously.³ Both factors have an impact on banks' resilience to stress.

On the positive side, banks are generally better capitalised than, say, a year ago. This is partly explained by the fact that banks have not paid dividends to shareholders or bought back shares in 2020.

Some systemic banks fall short of buffer requirements

Chart 2

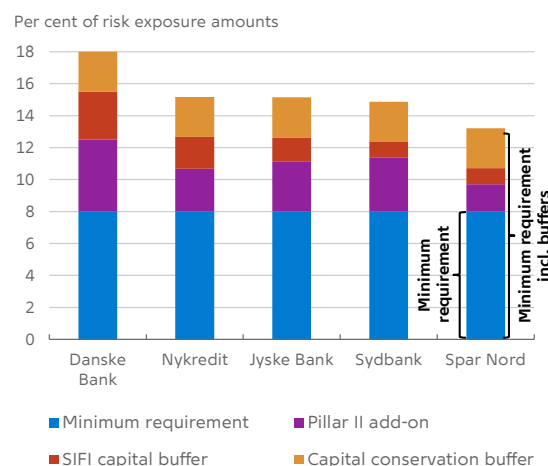


Note: The chart shows the excess capital adequacy or capital shortfall of systemic banks that either have excess capital adequacy or a capital shortfall as percentages of their total risk exposure amounts.

Source: The Danish Financial Supervisory Authority and own calculations.

Composition of capital requirements for selected systemic banks

Chart 3



Note: Capital requirements, mid-2020.

³ Danmarks Nationalbank, Banks should keep their powder dry, Danmarks Nationalbank Analysis, No. 28, December 2020.

The release of the countercyclical capital buffer in March 2020 also helped to increase banks' excess capital adequacy. However, the latter does not change the excess capital adequacy in a stress scenario as Danmarks Nationalbank normally assumes in its stress tests that the buffer is released in such a scenario.

But when it comes to earnings, banks are in a slightly weaker position now than they were a few years ago. In recent years, lower net interest income and higher costs have reduced core earnings by the systemic banks. This is partly offset by higher income from administration margins and fees.

The stress test projects certain items based on developments in recent years. One such item is bank costs, where costs as percentages of total assets are projected based on an average of the years prior to the stress test. Some banks have experienced higher costs in recent years, reducing their projected core earnings in the stress test. As a result, they have less capital to cushion the effects of a downturn, and lower earnings could weaken the longer-term resilience of the banking sector. And they will be hit harder when impairment charges increase in a stress scenario.

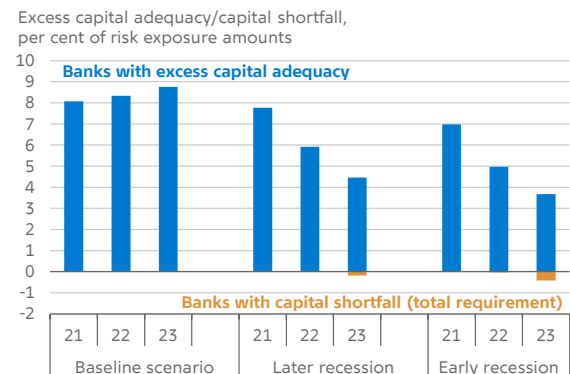
Some small banks fall short of capital requirements

Most non-systemic banks are able to withstand the recession scenarios without falling significantly short of their capital buffer requirements, see Chart 4. But a few non-systemic banks fall short of the buffer requirements in the severe recession scenario, and overall they will be about kr. 750 million short of satisfying all buffer requirements in 2023. Breaches of the buffer requirements of this magnitude are not deemed to pose a threat to financial stability.

All non-systemic banks meet the risk-based minimum requirement and the 3 per cent leverage ratio requirement in both recession scenarios.

Most non-systemic banks meet buffer requirements

Chart 4



Note: The chart shows the excess capital adequacy or capital shortfall of non-systemic banks that either have excess capital adequacy or a capital shortfall as percentages of their total risk exposure amounts. The reason for the accumulation of capital in the baseline scenario is that non-systemic banks are assumed to retain earnings in order to satisfy the MREL, which will be gradually phased in until 2023.

Source: The Danish Financial Supervisory Authority and own calculations.

Most banks are closest to breaching the MREL

For most banks included in the stress test, the MREL (Minimum Requirement for Own Funds and Eligible Liabilities) is the requirement they are closest to breaching.

For systemic banks, the MREL has been set at a level equivalent to twice their risk-based capital requirement.⁴ Banks may satisfy this requirement by means of the capital used to meet the capital requirements and by means of further MREL-eligible liabilities. The composition of the MREL will be adjusted with the

⁴ Today, mortgage credit institutions are subject to a debt buffer requirement of 2 per cent of their unweighted lending, but from 2022 a requirement for a minimum of 8 per cent of the group's total liabilities and own funds will apply.

implementation of the Bank Recovery and Resolution Directive (BRRD II) in 2021, but this stress test does not take these upcoming changes into account.

In a stress scenario, banks suffer losses and their equity is eroded. Moreover, some of the banks' eligible liabilities will no longer count towards MREL when their remaining maturity falls below one year. If banks are to meet the MREL, they must issue new MREL-eligible instruments, both in order to compensate for the loss of capital and to replace old issuances. It is important for banks to ensure that they have sufficient excess capital adequacy relative to the MREL, and that their issuances have a smooth maturity profile and are of long maturity.⁵

In the recession scenarios, systemic banks, in particular, will have a substantial need to issue new MREL-eligible instruments, see Chart 5. The chart shows an estimate of the issuance shortfall of the systemic banks relative to the MREL in a stress scenario if they do not issue new MREL-eligible instruments in the last two and a half years of the stress test period.

Banks may satisfy the MREL by means of both capital and certain debt issuances that meet the requirements for MREL-eligible instruments. Chart 5 shows the total issuance requirement, which includes both the effect of debt issuances ceasing to count towards the MREL and the effect of equity losses.

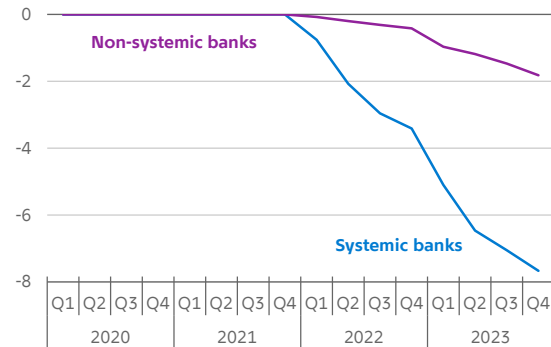
As mentioned earlier, banks have increased their excess capital adequacy during the past year, thereby also increasing their excess capital adequacy relative to the MREL. Conversely, the pace of new issuances of MREL-eligible instruments has flattened in 2020,⁶ illustrating that it may be both difficult and expensive for banks to issue new MREL-eligible instruments during periods of financial market turmoil such as the period after the covid-19 outbreak.

When times are good, banks should therefore ensure robust excess capital adequacy relative to the MREL, with a sufficiently diversified maturity profile, to avoid

Systemic banks will have large issuance requirements

Chart 5

Issuance need (shortfall relative to MREL), per cent of risk exposure amounts



Note: The MREL shortfall is defined as the amount by which banks (systemic and non-systemic, respectively) are short of satisfying the MREL divided by their total risk exposure amounts. Banks' MREL resources and maturity profiles have been estimated on the basis of data provided by the Danish Financial Supervisory Authority, Bloomberg and the banks' risk reports.

Source: The Danish Financial Supervisory Authority, Bloomberg and own calculations.

ending up having to reduce their activities to be able to meet the requirement.

Unlike the systemic banks, the non-systemic banks primarily satisfy the MREL using own funds. Since the MREL consists of the general capital requirement plus an add-on, the MREL is generally the binding requirement on the non-systemic banks. Several of the non-systemic banks have difficulty satisfying the MREL in the recession scenarios.

For non-systemic banks, the MREL will be phased in gradually until 2023. However, the Danish Financial Supervisory Authority has made the phasing-in conditional on a number of assumptions about levels of earnings and impairment charges during the phasing-in period. Should these assumptions fail, the phasing-in period may be extended. Following the

⁵ Danmarks Nationalbank, Credit institutions are facing hard times, *Danmarks Nationalbank Analysis*, No. 8, May 2020, shows that Danish banks' issuance of MREL debt has relatively shorter maturities than other European banks.

⁶ Danmarks Nationalbank, Banks should keep their powder dry, *Danmarks Nationalbank Analysis*, No. 28, December 2020.

covid-19 outbreak, the Danish Financial Supervisory Authority has extended the phasing-in period by six months.

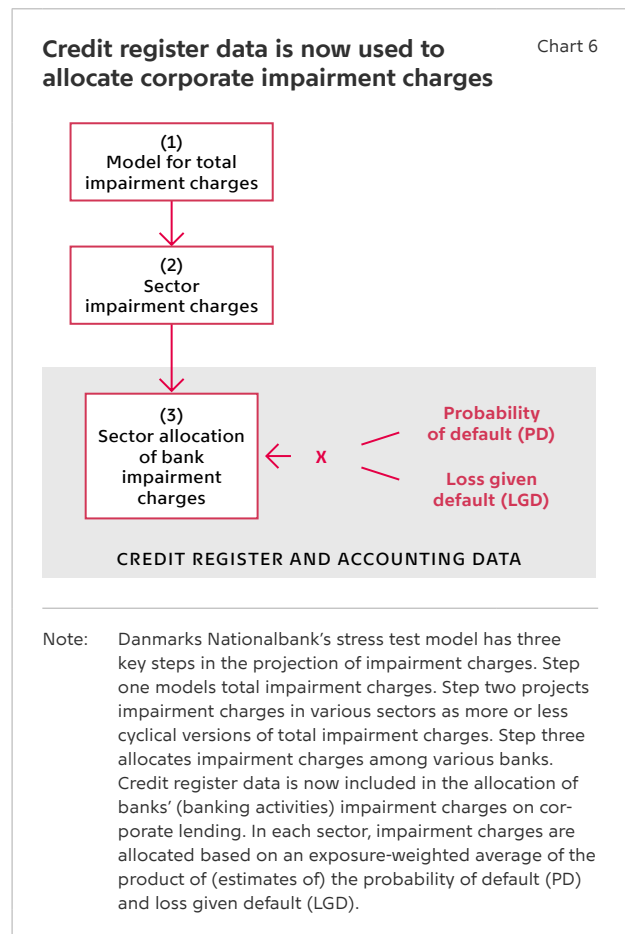
Credit register data used to allocate impairment charges

Loan impairment charges are the predominant source of losses for banks in Danmarks Nationalbank's stress test. Somewhat simplified, the calculation of banks' impairment charges in the stress test involves three steps. Step one projects total impairment charges based on the historical correlation between total impairment charges and the pattern of macroeconomic variables such as GDP, unemployment and house prices. Step two models impairment charges in various sectors as more or less cyclical versions of total impairment charges. For instance, the construction sector has historically experienced particularly high impairment charges in downturns.

Steps one and two provide an indication of the levels of impairment charges in various sectors in a scenario. This means that it is possible to provide an indication of each bank's impairment charges by multiplying the bank's sector exposures by the impairment charge ratios for these sectors. However, historically, some banks have recorded higher impairment charges than would be expected based on the sector allocation of their loans, others lower. Therefore, step three performs institution-specific adjustments based on factors such as the individual institution's impairment charges relative to its expected impairment charges. The credit register makes it possible to add new dimensions when it comes to step three, allocation of impairment charges, see Chart 6.

Under financial reporting standards, impairment charges should reflect expected credit losses. And the expected credit loss on a customer depends both on the probability of the customer defaulting on its obligations and on the loss given default. Consequently, trying to estimate these factors when allocating impairment charges makes obvious sense.

For the purposes of the stress test, we estimate default probabilities based on historical accounting and default data for a broad segment of Danish



corporations. These probabilities can be linked to credit register data for banks' exposures to the corporations in question. The credit register also gives an insight into the collateral held by banks for their loans to these corporations, thereby providing an indication of the potential bank losses given default.

Specifically, we calculate a 'score' for each bank and in each sector. This score is an exposure-weighted average of the product of the probability of default and an estimate of the loss given default, used to allocate impairment charges within each sector. If, say, Bank A has a score of 1.0, while Bank B has a score of 1.3 for manufacturing loans, Bank B will be allocated a manufacturing impairment charge ratio 1.3 times higher than that of Bank A in the stress test.

So far, credit register data is used only to allocate impairment charges to banks' corporate exposures. Credit register data is likely to be extended to include more exposures in the future.

Stress test scenarios

Danmarks Nationalbank's stress test is based on three macroeconomic scenarios, covering the period from mid-2020 to 2023: a baseline scenario and two recession scenarios in which the economic downturn begins in early 2021 in one scenario and six months later in the other. The early recession scenario is the most severe of the two recession scenarios. Key variables for the scenarios are set out in Appendix 2.

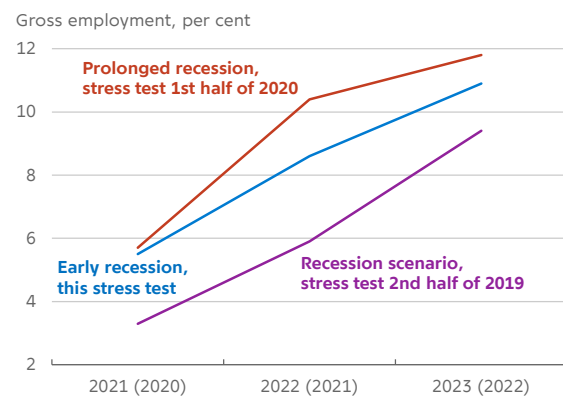
The baseline scenario follows Danmarks Nationalbank's projection for the Danish economy. Both recession scenarios are based on a global downturn in which export market growth is reduced, GDP and house prices decline substantially, and unemployment increases. In the early recession scenario, GDP contracts by 3.4 per cent, while unemployment increases by 5.4 percentage points over a 3-year period.

If GDP growth during the stress period is considered in isolation, the scenarios seem to be relatively mild, but allowing for the preceding fall in GDP, the scenarios are relatively severe. The pattern of unemployment, compared with similar patterns in scenarios from the two previous stress tests, provides a better indication of the severity of the scenarios, see Chart 7. The chart shows that the scenario from the 2nd half of 2020 is considerably more severe than the scenario we were looking at a year ago, but slightly milder than the prolonged recession scenario from the spring stress test. This is in line with the worsening of the risk scenario due to the pandemic, but also reflects the fact that the uncertainty surrounding the outlook six months ago is now less extreme.

When preparing the recession scenarios, Danmarks Nationalbank emphasised developments in unemployment, real GDP and house prices. For each of these variables, a systematic approach was applied to determine their increase (unemployment) or fall (GDP growth and house prices).⁷ We specifically seek

The recession scenario is more severe than normal – but not quite as severe as in the spring

Chart 7



Note.: The chart shows the level of gross unemployment for the last three years of the stress test period, i.e. 2021-23 in this stress test and 2020-22 in the two previous ones.

Source: Previous stress tests.

to hit specific targets for developments in unemployment, real GDP and house prices (deflated by disposable income). These targets are based on historical data and are thus backward-looking. This approach ensures that the scenarios reflect economic developments, entailing, for instance, that stress decreases after a period of severe economic downturn.

It has proved difficult to hit the targets for GDP and unemployment simultaneously within the framework of MONA, the model used by Danmarks Nationalbank to produce the scenarios. According to the targets, real GDP should contract by 3.4 per cent, while the target for unemployment was an increase of 4.3 percentage points. In the early recession scenario, the GDP decline matches the target, while the unemployment increase of 5.4 is above target. This is in part due to the shock occurring earlier than

⁷ The scenarios are developed in cooperation with the Danish Financial Supervisory Authority. The approach used to generate the scenarios is described in detail in Danmarks Nationalbank's stress test (Danmarks Nationalbank, The largest banks satisfy capital requirements in stress test, *Danmarks Nationalbank Analysis (stress test)*, No. 21, November 2018).

normal in the stress test. In MONA, changes in unemployment lag changes in GDP, and the earlier shock combined with the contraction in GDP in the run-up to the stress test, cause unemployment to rise more than normal in the stress test.

Appendix 1 : Stress test population

Systemic banks (credit institutions)

Danske Bank

Nykredit Realkredit

Jyske Bank

Nordea Kredit

Sydbank

DLR Kredit

Spar Nord

Non-systemic banks (credit institutions)

Arbejdernes Landsbank

Ringkøbing Landbobank

Sparekassen Kronjylland

Vestjysk Bank

Lån & Spar Bank

Jutlander Bank

Sparekassen Sjælland-Fyn

Den Jyske Sparekasse

Sparekassen Vendsyssel

Appendix 2: Stress test scenarios

Key variables	Table		
	Baseline scenario	Later recession	Early recession
2021			
GDP, per cent year-on-year	2.9	1.4	-1.1
Private consumption, per cent year-on-year	5.9	4.5	2.7
Export market growth, per cent year-on-year	4.1	4.1	-0.1
House prices, per cent year-on-year	3.0	0.8	-5.8
Gross unemployment, per cent of labour force	4.0	4.6	5.5
Bond yields	0.2	0.2	0.2
2022			
GDP, per cent year-on-year	3.3	-2.9	-2.0
Private consumption, per cent year-on-year	4.2	-2.3	-1.9
Export market growth, per cent year-on-year	6.4	-0.6	1.5
House prices, per cent year-on-year	2.7	-13.2	-17.5
Gross unemployment, per cent of labour force	3.9	7.2	8.6
Bond yields	0.3	0.3	0.3
2023			
GDP, per cent year-on-year	2.6	0.0	-0.3
Private consumption, per cent year-on-year	2.4	-1.1	-1.2
Export market growth, per cent year-on-year	4.8	-3.6	-5.3
House prices, per cent year-on-year	4.2	-10.1	-4.9
Gross unemployment, per cent of labour force	3.8	9.7	10.9
Bond yields	0.4	0.4	0.4
Note: Annual averages. House prices are cash prices of single-family houses.			

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