This memo is part of material submitted for the meeting of Forenet Kredit's Board of Representatives on 23 November 2017.

Nykredit

Copenhagen, 10 November 2017

APPENDIX 2: NYKREDIT'S CAPITAL FLEXIBILITY NEED

This note is structured as follows:

1 Introduction
2 Nykredit's business model, rating and regulatory requirements
3 Nykredit's current capital position
4 Conclusion

It includes the following appendices:

I Capital rules etc – a backward glance and a forward look
II The capital target requirements of the Danish FSA – a letter to Nykredit
III Glossary

1 Introduction

Nykredit is the only systemically important financial institution (SIFI) in Denmark today that is unable to raise additional share capital (Common Equity Tier 1, or CET1, capital) if necessitated by new crises, new regulation or other factors. A common characteristic of all Nykredit's shareholders is their inability to contribute additional capital, should Nykredit need it. So far, the only way that Nykredit has been able to build capital has been through retained earnings. However, generating capital through retained earnings can be a lengthy process considering how fast Nykredit's capital need may change.

This poses a growing challenge for Nykredit. First, Nykredit increasingly finds that changes to EU regulation etc do not take into consideration Nykredit's business mix nor the unique Danish mortgage model. This often means that Nykredit is impacted differently, and harder, by changes to the rules than other financial services groups.

Second, the pace of regulation has accelerated over the past few years. Previously, the requirements imposed on Nykredit were relatively constant, and when regulation changed, there was always a long phase-in period allowing Nykredit to adapt to the new regulatory framework at a prudent pace. But this is no longer the case, and over the past few years Nykredit has become increasingly vulnerable in terms of being able to adapt relatively quickly to amended capital requirements. The main reason is that Nykredit's four shareholders are all unable to contribute additional CET1 capital, should the need arise.

Third, regulation has become increasingly variable. For instance, Nykredit's capital requirements will grow considerably if property prices fall and unemployment rises. Further, the authorities have been given more administrative powers to amend capital requirements etc, which makes the regulatory framework more unpredictable.

Fourth, Nykredit's main activity, mortgage lending, is not necessarily considered a low-risk activity by international authorities, as the latest crisis demonstrated that property prices can decline significantly. As a consequence, the capital requirements for loans secured by mortgage on real estate increase substantially these years.

Overall, this means that a situation in which Nykredit is only able to build CET1 capital through retained earnings has become untenable. Nykredit's need for very high capitalisation due to its inflexible access to capital is confirmed by the Danish FSA in a letter dated 27 September 2017, which is dealt with in this note (see also Appendix 2).

In connection with the sale of a minority shareholding in Nykredit A/S to a group of Danish pension companies, Nykredit will be able to establish a structure that ensures reliable access to CET1 capital, thereby eliminating Nykredit's capital vulnerability.

Before describing the capital and regulatory aspects in more technical detail, this note explains the external environment in which Nykredit operates today.

2 Nykredit's business model, rating and regulatory requirements

Below please find a description of Nykredit's business model and the rating and regulatory requirements it faces.

Nykredit is characterised by being:

a) The only Danish financial services group where the mortgage bank has not been acquired or founded by a universal bank.

b) Denmark's largest lender with a loan portfolio of about DKK 1,200bn. Nykredit provides lending all across Denmark, in every region and to all industries. No other universal or mortgage bank can match that.

c) One of the largest European mortgage covered bond issuers with a broad investor base in Denmark and internationally.

d) A financial services group where residential and mortgage lending makes up a very high proportion of its balance sheet by European standards.

Bond ratings are necessary:

a) Ratings became necessary during the 1990s following, for instance, the establishment of mortgage banks owned by universal banks, which achieved high ratings based on strong, intra-group support. Nykredit was not able to copy that structure and instead focused on capital, earnings and collateralisation by way of government bonds etc in cover pools, also known as capital centres. The capital centres are the legal units out of which Nykredit's covered bonds are issued.

b) In good times, it is relatively easy to meet the rating and market requirements. In more difficult times, the requirements for capital, earnings and supplementary collateral increase. Around 2011 all Danish mortgage banks experienced difficulties in the bond markets, with Moody’s in particular imposing extremely high requirements. This led to a successful termination of the rating relationship with Moody's but also prompted mortgage banks to implement measures that could lead to better ratings going forward. For example, Nykredit introduced two-tier mortgaging for both personal and business customers. Today two-tier mortgaging is only applied to business lending.

Financial regulatory requirements are variable – and at the same time increasing:

a) After the financial crisis, financial regulation has been designed so that the requirements are changeable.

   In 2013 EU authorities and national authorities were empowered to make significant changes to the rules. Those administrative powers are increasingly exercised, and this has led to substantially higher requirements. New requirements often affect Nykredit more severely than its competitors, since, as mentioned above, its business mix and structure differ from those of its competitors. Examples are given in Appendix 1.

   These administrative powers come on top of the variability inherent in capital requirements due to the movements in property prices and changing economic trends. During an economic upturn and/or in periods of rising property prices, the risk relating to Nykredit's lending, and consequently the risk exposure amount (REA) used to calculate the capital requirement, will decline. During an economic downturn and in periods of declining property prices, the risk, and consequently REA, will increase. At Group level, calculated REA will grow by about 30% when the economic climate changes from the present to a situation with declining property prices and high unemployment. In recent years, new regulation and changes to the economic climate have affected Nykredit's REA more than have business trends.

b) The greatest regulatory challenge to Nykredit is that the Group's main activity, ie mortgage lending, is not necessarily considered a low-risk activity, especially by international authorities.

   Internationally, loans secured by mortgage on real estate are often considered to be high-risk loans, as property prices can decline substantially. Also, deposits by private individuals and small businesses are considered the safest source of funding. The issuance of covered bonds and other securities, however, is considered to be less safe, as financial markets are, by nature, volatile, and because the investment capacity and preferences of investors may change.

   Nykredit completely disagrees with this view. In Denmark, household pension savings are much larger than in other countries, and this, together with the sound Danish economy, enables Danes to sustain higher debt levels than in other countries. Pension funds also provide the basis for stable bond funding. Moreover, mortgage lending is match-funded, ie the loan payments match the bond payments. Generally, there is therefore no risk of mortgage lending being underfunded.

c) Another reason for the ever increasing capital requirements etc is the risk of market overvaluation, for instance overvaluation of the housing market due to the very low interest rate levels. This may lead to speculative price bubbles. The risk of price bubbles is a significant reason for Sweden's and Norway's capital requirement tightening and one of the main reasons for Basel IV.

From an EU policy point of view and from the point of view of the authorities, the growing capital requirements are a consequence of the financial crisis. Also, the low-rate environment structurally increases the risk of traditional low-risk areas such as home financing, and the risk landscape is continuously changing. Financial undertakings must adapt to this, and the managements of SIFIs such as Nykredit

must also consider potential regulatory changes and the possibilities of raising more CET1 capital at a relatively short notice, should the need arise.

Appendix 1 describes the main regulatory changes from 1990 until today as well as the upcoming requirements that we currently know about. As appears, the requirements are tightened with increasing frequency.

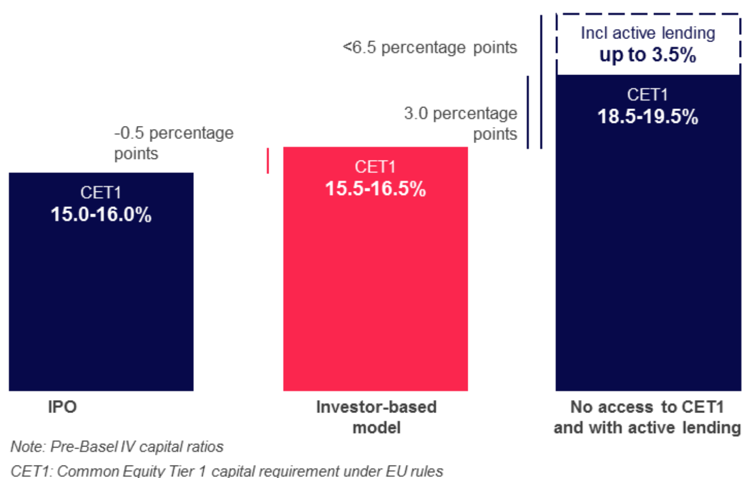
3 Nykredit's current capital position

Thus far, the Board of Directors has set a CET1 capital ratio target of 17.5% for Nykredit Realkredit. The capital target reflects Nykredit's special characteristics as one of Europe's largest bond issuers and its current status as an unlisted company with more restricted access to capital markets than listed companies.

In August/September 2017, the Danish FSA presented new guidelines for Nykredit's capital structure. Formally, the text was part of the Danish FSA's written response to Nykredit's annual assessment of its internal capital adequacy requirement. Appendix 2 contains the letter from the Danish FSA.

The Danish FSA has introduced a graduation of the requirements imposed on Nykredit based on Nykredit's capital flexibility relative to listed SIFIs. In practice, there are four steps to the Danish FSA approach to determining capital targets. The steps are illustrated in Chart 1 and explained in detail below.

Chart 1: Steps in the determination of capital targets



Note: Pre-Basel IV capital ratios
CET1: Common Equity Tier 1 capital requirement under EU rules

As described in Appendix 1, the Danish FSA's response represents but one example of administrative changes to the requirements applying to Nykredit that Danish and European authorities may implement at short notice. Thus, Nykredit's external capital requirements do not imply one specific capital requirement that can be saved up for. The requirements are continuously changing.

<u>Step 1</u> is looking at Nykredit as a listed SIFI. Here, the new requirement is the ability to pass a severe stress test (severe recession involving high unemployment and property price declines) and still comply with the formal regulatory requirements <u>without</u> raising new CET1 capital. According to recent years' stress tests, a severe recession would typically lead to a drop in Nykredit's CET1 capital ratio of 3.5-4.5 percentage points. Listed companies can make up for a drop in their CET1 capital

ratio caused by a crisis by issuing new shares, either at market price or at a discount.

The Danish FSA specifically writes [translation by Nykredit]:

> *"It is the opinion of the Danish FSA that the capital targets of a SIFI must be sufficient for the SIFI to be able to fulfil capital requirements, including buffer requirements, under a severe stress.*
>
> *[…]*
>
> *The results obtained by Nykredit in the Danish FSA's macroeconomic stress tests (August 2017) indicate that, as a listed undertaking, the Nykredit Group's capital targets should currently be a CET1 capital ratio of at least 14% and a total capital ratio of at least 19% for the purpose of meeting the fully loaded capital requirements (excluding a countercyclical capital buffer) in a severe stress scenario. More stable capital targets, allowing for varying stress test results over time, would be a CET1 capital ratio of 14.5% and a total capital ratio of 19.5%."*

The Danish FSA is thus of the opinion that a listed Nykredit should have a minimum CET1 capital target of 14.5%.

To this should be added a business capital buffer to make sure that minor operational and regulatory fluctuations would not bring Nykredit into conflict with the stress test requirement. This buffer should be at least 0.5%, indicating a minimum capital need of 15% under normal operations. On top of that comes a buffer of 0-1 percentage points, reflecting a typical rise in CET1 capital during a financial year due to the current operating profit. That brings the required CET1 capital ratio to 15-16%. A level of 15-16% is equivalent to the capital levels of Danish peers and matches the requirements of credit rating agencies. Given Nykredit's current REA of about DKK 350bn, this corresponds to DKK 52.5bn-56bn.

Table 1 illustrates the structure of the 15-16% CET1 capital need. The table also shows the capital need under the proposed investor-based model and for Nykredit without access to capital. See below for more details.

Table 1: Structure of pre-Basel IV capital need

	CET1	
Regulatory requirement	4.5%	
Pillar II (variable)	1%	
SIFI requirement	2.0	
Permanent buffer	2.5%	
Counter-cyclical buffer	0%	
Total requirement	**10%**	
FSA voluntary precautionary buffer	0.5%	
Total actual requirement	**10.5%**	
Stress-testing requirement (new FSA approach)	4.0%	
FSA SIFI requirement incl stress/minimum capital target	**14.5%**	
Management buffer – business and regulatory changes	0.5%	
Minimum capital need under normal operations	**15%**	
Buffer for capital build-up during financial year	0-1%	
Capital need in view of new FSA requirement	**15-16%**	
Surcharge for slightly less capital flexibility under investor-based model	0.5%	
Capital need under investor-based model	**15.5-16.5%**	Future
Surcharge for less capital flexibility applicable to institutions without access to CET1 capital (on top of 15-16%)	Up to 3.5%	
Capital need without access to CET1 capital	**18.5-19.5%**	
Surcharge due to objective of maintaining active lending during and after a crisis (dependent on lending objective)	Up to 3.5%	Today
Capital need incl objective of active lending during and after a crisis	**Up to 23%**	

Step 2 in Nykredit's case is an assessment of the capital need under the proposed investor-based model where a consortium of pension funds buy a shareholding from Forenet Kredit and undertake to contribute additional capital, should such need arise.

In the opinion of the Danish FSA, the capital flexibility offered by the proposed investor-based model with a few investors is in principle slightly lower than that of a stock exchange listing. The Danish FSA has therefore indicated that the capital target must be 0.5 percentage points higher under this model than for a listed Nykredit. This corresponds to a CET1 capital requirement of 15.5-16.5% (DKK 54bn-58bn if REA is DKK 350bn).

However, the 0.5 percentage point surcharge may be reduced as Forenet Kredit builds up its capital reserves.

The Danish FSA wrote the following to Nykredit in an email dated 23 October 2017 [translation by Nykredit]:

> *"Against this background, it is assumed that the Nykredit Group intends to maintain a higher level of capitalisation until the implementation of Basel so that the level of capital will not have to be raised at that time.*

> *The Danish FSA finds that precedents exist showing that even credit institutions with a very strained capital position are able to raise capital in the stock market, and such market access must therefore be considered to be of independent value.*
>
> *Based on this and the specific scenarios applying to Nykredit, the Danish FSA agrees that the model not involving a stock exchange listing will require a CET1 capital target that is 0.5 percentage points higher than in the other scenario, but also that this surcharge may be reduced as Forenet Kredit builds up its capital reserves, provided that such reserves are earmarked for supporting a capital contribution to Nykredit."*

As appears from the Danish FSA's email, it is a prerequisite of its assessment of Nykredit's capital need under the proposed investor-based model that Nykredit already now seeks to meet the need for additional CET1 capital that is expected to arise when the Basel Committee proposes new capital standards and the EU adopts a new Capital Requirements Directive and a new Capital Requirements Regulation. The upcoming Basel IV rules and EU rules (CRD5/CRR2) are not as such regulatory requirements today, but should still be incorporated into Nykredit's overall capital planning. The Danish FSA thus requires that Nykredit does not temporarily reduce the capital level only potentially to have to raise it again when the rules enter into force or if markets demand it. On the existing basis, the Danish FSA and Nykredit expect Nykredit's REA to rise by about DKK 100bn as a result of Basel IV etc.

Nykredit's post-Basel IV capital need is determined based on a REA of about DKK 450bn. It will probably be possible to lower the capital need by 0.5 percentage points after Basel IV etc, as the capital requirements will be less risk-sensitive. Nykredit's minimum CET1 capital ratio will therefore be 15-16% under the investor-based model against 15.5-16.5% today, see above. This corresponds to CET1 capital of DKK 67.5bn-72bn. Nykredit's CET1 capital is currently about DKK 71bn.

As a listed undertaking or an unlisted undertaking without access to capital, Nykredit would, of course, also have to address any additional capital requirement following from Basel IV etc.

In <u>step 3</u> the Danish FSA will raise the capital requirement if the institution has no access to new CET1 capital, as is the case for Nykredit today. According to the Danish FSA, a SIFI should be able to sustain losing capital as if in a severe recession and still maintain a capital level almost equivalent to that of listed SIFIs after they have solidified their capital position by issuing new shares on the stock exchange.

The Danish FSA specifically writes [translation by Nykredit]:

> *"Especially as concerns capital flexibility, the Danish FSA finds that insufficient flexibility calls for an additional capital surcharge of 3-3.5 percentage points.*
>
> *This surcharge should be viewed in light of past experience indicating that during a crisis, SIFIs may need to bolster their capital position in order to maintain their lending capacity. An unlisted SIFI should therefore generally have higher excess coverage due to its poorer access to capital. Nykredit already had such excess coverage before the latest crisis and was therefore able to increase lending in Denmark during the crisis".*

In practice, the Danish FSA's approach implies that SIFIs with no access to new CET1 capital must have an extra capital buffer from the start, making up for the fact that they cannot raise new CET1 capital in the stock market after a crisis. In Nykredit's case, the Danish FSA has set this extra CET1 capital buffer at 3-3.5%.

Adding this extra buffer to the 15-16% CET1 capital need for listed credit institutions, cf above, the total CET1 capital requirement will be 18.5-19.5% for a Nykredit without access to new CET1 capital. In relation to the public debate, it should be noted that the Danish FSA does not consider models without hard financial incentives for the existing owners to be equivalent to models that offer a capital flexibility comparable with that of a stock exchange listing. Also, it is a prerequisite that the existing owners have the ability and will to contribute the relevant amount.

Finally, step 4 of the Danish FSA's approach is to look at whether the lending objectives of a SIFI are particularly capital-intensive. In that case, the capital requirement must be one step higher if the SIFI has no access to new CET1 capital.

The Danish FSA specifically writes [translation by Nykredit]:

> *"As regards other institution-specific factors, including the business model, the capital targets must be aligned with the business model. For instance, Nykredit should be aware that all SIFIs are expected to have capital targets enabling them to maintain lending at all times. However, Nykredit's business model includes a more explicit ambition in this area, which calls for particularly prudent capital targets."*

The consequence of the Danish FSA's requirements is that Nykredit must have sufficient capital from the start to get through a crisis while at the same time maintaining a business model providing for active lending as defined in the key priorities of Forenet Kredit and the Nykredit pledges. This should be achieved without the contribution of capital and without conflicting with the requirements applying to Nykredit as a SIFI without access to new CET1 capital.

The Danish FSA does not quantify such extra buffer. The size will depend highly on the ambition of Nykredit's lending strategy also during and after a crisis. Based on the current targets and pledges, the size of the required extra CET1 capital buffer is estimated at about 3.5%. This level reflects Nykredit's de facto CET1 capital losses during a crisis.

The additional capital need should also be viewed against the fact that the Danish FSA is likely to require the lost capital to be restored within a few, probably two, years. This will be very difficult for a credit institution with limited capital flexibility.

As a consequence of the Danish FSA's stricter requirements, Nykredit's capital need will differ according to its access to new CET1 capital and Nykredit's lending objectives. The relevant capital needs are summarised in Box 1.

Box 1: Nykredit's capital needs in different scenarios

For Nykredit, the Danish FSA's requirements give rise to the following capital need (including management buffers on top of the hard regulatory requirements):

1) A CET1 capital ratio of 15-16% if listed.

2) A CET1 capital ratio of 15.5-16.5% subject to the proposed access to capital via a small group of pension funds and liquid capital reserves in Forenet Kredit.

3) A CET1 capital ratio of 18.5-19.5% if without access to new CET1 capital and without Nykredit's business model providing for active lending before, during and after a severe recession.

4) A higher capital ratio than under 3) if without access to new CET1 capital and with Nykredit's business model providing for active lending before, during and after a severe recession. Based on the current lending objectives, the extra CET1 capital buffer is estimated at about 3.5%.

Assuming an expected REA for 2018 of about DKK 350bn (current level plus known regulatory changes and budgeted business growth) and DKK 450bn after Basel IV and CRD5/CRR2. It is estimated that the capital ratios under Basel IV could be 0.5 percentage points lower than today. In net terms, this corresponds to the following CET1 capital requirements:

1) If listed:
   - A CET1 capital requirement of 15-16% of DKK 350bn, or DKK 53bn-56bn
   - Basel IV estimate: a CET1 capital requirement of 14.5-15.5% of DKK 450bn, or approximately DKK 65bn-70bn.

2) Under the proposed investor-based model, including the liquid assets of Forenet Kredit:
   - A CET1 capital requirement of 15.5-16.5% of DKK 350bn, or DKK 54bn-58bn.
   - Basel IV estimate: a CET1 capital requirement of 15-16% of DKK 450bn, or approximately DKK 67bn-72bn.

3) If unlisted, excluding the five key priorities of Forenet Kredit and the six Nykredit pledges:
   - A CET1 capital requirement of 18.5-19.5% of DKK 350bn, or DKK 65bn-68bn
   - Basel IV estimate: a CET1 capital requirement of 18-19% of DKK 450bn, or approximately DKK 81bn-86bn

4) If unlisted, including the five key priorities of Forenet Kredit and the six Nykredit pledges:
   - A higher capital requirement than under 3), depending on the level of ambition.

4 Conclusion

Access to capital is a prerequisite for Nykredit's ability to maintain and develop lending at all times and when the external requirements change.

Access to capital will ensure that the five key priorities of Forenet Kredit and the six Nykredit pledges can be fulfilled without the need for holding very large capital reserves; capital reserves that may seem unnecessary in some periods but in other periods may prove too small to maintain active lending. This dilemma can only be solved by Nykredit obtaining access to capital.

As a credit institution without capital flexibility, Nykredit would have to hold capital at a level some DKK 15bn higher than if Nykredit had access to capital. Including the objective of maintaining active lending also during and after a crisis, the figure is higher. This would require a substantial accumulation of capital over the next years. Such capital accumulation is possible but must be regarded as unnecessary considering the alternative of attracting strong shareholders.

Thus, the price of maintaining Nykredit's present ownership structure with shareholders that are unable to contribute additional capital is relatively high. The investor-based model is quite simply a cheaper and safer way of preserving Nykredit's DNA – the five key priorities of Forenet Kredit and the six Nykredit pledges.

The proposed investor-based model creates a situation in which Forenet Kredit, together with new investors, can secure Nykredit's development, competitiveness and lending capacity going forward.

Appendix I: Capital rules etc – a backward glance and a forward look

<table>
<tr><td>Before 1989</td><td>Before 1989 there were no actual rules governing capital adequacy or the determination of equity but only minimum requirements for mortgage association reserves. The reserve requirements applied to loans with joint and several liability between borrowers, as was the typical setup of mortgage associations at the time, and a substantial part of this liability could be included in the determination of reserves.</td></tr>
<tr><td>1989 – 2003</td><td>From 1989 capital markets were liberalised with the introduction of the EU single market. Denmark prohibited the establishment of new mortgage associations, and mortgage associations were allowed to set up public limited companies to continue lending activities as mortgage banks. The freedom of establishment was introduced for mortgage banks, also when established by universal banks. Mortgage banks were allowed to set up subsidiary deposit-taking banks, and the tax exemption for mortgage associations/mortgage banks was abolished.

At the same time higher, but still fixed, capital requirements were introduced. The EC Own Funds Directive and Solvency Ratio Directive (implementing Basel I) stipulated that a credit institution's capital base must be at least 8% of its risk-weighted assets. The capital base consisted of core capital and subordinated debt. The option of including the joint and several liability in the determination of capital reserves was abolished as a result of the liberalisation and the competitive situation.

As a result of the competitive situation, the high loan origination fees of 1-2% of the loan amount were removed.

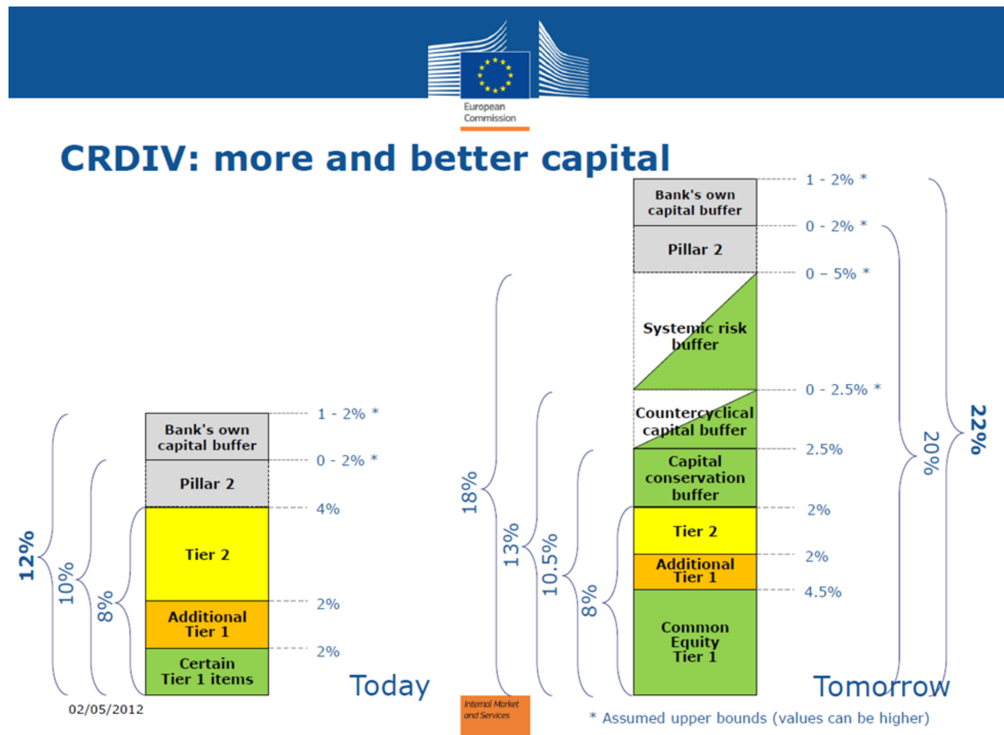
The rating of covered bonds based on the provision of supplementary collateral by way of eg government bonds was introduced in about 2000.

Nykredit Bank was established in the mid-1990s. Totalkredit was acquired in 2003.</td></tr>
<tr><td>2004 – 2007</td><td>The Basel II rules were discussed at the beginning of the 2000s, and in 2004 the final revised capital requirement framework was in place. The second EU capital adequacy directive, known as the first EU Capital Requirements Directive, was adopted on the basis of this framework in 2006. Final implementation was set for 2007, as the process of obtaining approval as a so-called advanced IRB institution was lengthy.

The capital adequacy of advanced IRB institutions was determined using the institutions' internal models and loss history. Such internal ratings-based (IRB) models became a de facto requirement for all SIFIs. The national financial supervisory authorities were charged with approving advanced IRB institutions and their models.

Nykredit's capital requirements declined substantially when approved as an advanced IRB institution, as Nykredit's business mainly consisted in lending secured by mortgage on real estate – in particular residential mortgage lending. As a result of the new IRB models for determining risk parameters, the risk weighting of residential mortgage loans dropped to about 15% from an originally fixed risk weighting of 50% under Basel I.</td></tr>
</table>

	A Pillar II requirement was introduced to cover all risks not covered by the Pillar I (minimum capital) requirement. With the introduction of IRB models, capital requirements became much more cyclical and ceased being fixed requirements. The determination of risk-weighted assets was now dependent on historical loan loss rates, the security behind the loans and customer ratings – including arrears and defaults. REA is about 30% higher in a recession with high unemployment than in a more favourable economic climate. Therefore, focus on the capital requirements in case of a severe recession increased – including on the conducting of stress tests based on the current economic climate. The CET1 capital requirement was 2 percentage points (as under Basel I), and the rest of the capital need of some 7 percentage points – including a Pillar II requirement of about 1 percentage point at the time – could be met with supplementary subordinated debt, which at the time cost only about 0.7% in terms of interest rate margin compared with 2-3% in recent years. However, the requirements relating to supplementary subordinated debt were somewhat higher in practice due to the introduction of transitional rules from Basel I to Basel II. As a result of these transitional rules, a credit institution was required to hold capital corresponding to 80% of the capital requirement under Basel I until end-2008. 2007 saw the adoption of new covered bond (SDO) legislation. Under this legislation, mortgage banks were to provide supplementary collateral for the part of lending exceeding statutory LTV limits (80% for private residential property) at all times. Mortgage banks got the opportunity to issue supplementary collateral by way of senior secured bonds (also known as junior covered bonds – JCBs).
2008-2012	Prompted by the financial crisis in 2008-2009, the Basel Committee started revising its recommendations and preparing completely new recommendations for capital and liquidity requirements. As a fast initial measure, a type of capital floor was introduced for the application of IRB models to market risk. The so-called Basel 2.5 framework was implemented through the EU's third Capital Requirements Directive in 2011. The first elements of Basel III were drawn up in December 2010 and were developed in more detail in the subsequent years. The first parts of Basel III did not change the risk-based approach introduced by Basel II but addressed the systemic risks that may build in the sector. Credit institutions were therefore to increase their capital buffers using the far more loss-absorbing Common Equity Tier 1 (CET1) capital. The requirements only became binding on Danish financial undertakings when implemented through EU legislation, but Danish credit institutions did not take long to adapt to the new rules.

	In this period, the overcollateralisation (OC) requirement of credit rating agencies was about 8% of nominal lending. Moody's presented a requirement of just under 30%, but as far as we know, none of the Danish credit institutions chose to comply. The transitional rules from Basel I to Basel II – which were supposed to expire at end-2008 – were extended by the EU. After that, the EU extended the Basel I capital floors several times, most recently to end-2017.
2013-2014	The fourth EU Capital Requirements Directive and the first EU Capital Requirements Regulation (implementation of the first parts of Basel III) were adopted in 2013 and will be phased in from 2014 to 2019. The financial crisis gave rise to a complete revision of the regulatory framework. Most large credit institutions adapted to the new capital rules already in 2013, regardless of the formal phase-in period. The capital requirements were still to be determined on the basis of internal IRB models and procyclical risk weights. But the requirements for the individual types of capital were tightened significantly with the aim of having shareholders and risk-tolerant investors absorb more of any losses resulting from the behaviour of credit institutions and to reduce the risk of governments having to cover losses in periods of crisis. At the same time, new capital buffers were introduced in addition to the statutory minimum requirement of 8%, which will increase the CET1 capital requirement going forward. On top of this, an additional requirement (a SIFI buffer) was introduced for the largest credit institutions. The chart below illustrates the changes as presented by former French Commissioner Michel Barnier at a meeting of the European Council of Ministers in May 2012. The green colour denotes the CET1 capital requirement. 

<table>
<tr><td></td><td>Nykredit's CET1 capital requirement rose from 2% to about 11.5% including countercyclical and SIFI buffers of 2%. Another 1.5% was to come from Additional Tier 1 (AT1) or a higher-quality capital, while the remaining approximately 4% could be met with Tier 2 capital, subordinated loan capital or higher-quality capital.

Also, the AT1 capital and Tier 2 capital requirements were tightened, making these capital instruments considerably more expensive than before the crisis.

Finally, a completely new concept was introduced in relation to the capital requirements framework, allowing administrative tightening of the capital requirements on an ongoing basis. Changes may be implemented by the European Commission, the European Banking Authority (EBA) or national authorities. The administrative powers are applied increasingly, and broadly speaking, new changes to the framework have been announced every three months during the last couple of years.

In 2014 the EU Bank Recovery and Resolution Directive (BRRD) was adopted, providing for national resolution authorities to determine minimum requirements for own funds and eligible liabilities (MREL) for the purpose of ensuring that failing credit institutions have sufficient excess capital and loss-absorbing liabilities to be able to recover by writing down these instruments or converting them into capital instruments. Mortgage banks were exempt from the MREL requirement due to their special status as non-deposit-taking institutions with a special resolution model. Instead, the Danish authorities imposed a debt buffer requirement on mortgage banks of 2% of lending.</td></tr>
<tr><td>2015-2017</td><td>Besides tighter capital requirements, a wide range of other regulatory changes have been implemented subsequently by the European Commission, the EBA and national authorities.

The Commission: Introduction of a short-term liquidity requirement (LCR) that in practice limits the covered bond purchases of universal and mortgage banks.

EU Directive (Solvency II) applying to pension funds etc: Exposure limits for pension funds and life insurance companies, limiting their holdings of covered bonds from any single issuer.

The EBA: Stricter Pillar II capital requirements. Raises Nykredit's CET1 capital requirement by about 1.5 percentage points to about 13% including the countercyclical buffer.

The Danish FSA: Introduction of the Supervisory Diamond, setting restrictions on the proportion of interest-only loans, loans that are sensitive to interest rate changes, loans subject to frequent refinancing etc.

The Danish FSA: Minimum risk weighting requirements for residential lending in growth areas.</td></tr>
</table>

	The EBA and the Danish FSA: The so-called statutory buffers (about 7%) are no longer requirements that can be breached by credit institutions in their capital planning or stress tests without consequences in case of sudden changes in the economic climate or other special circumstances. This increases the requirements for credit institutions' own buffers and consequently their total CET1 capital requirement. The Danish FSA (summer 2017) and soon the EBA: Stress tests are no longer indicative, ie that statutory buffer requirements can no longer be breached under special circumstances. This implies different capital requirements for Nykredit depending on its access to new CET1 capital (share capital) and its lending ambitions/business model. In the other Nordic countries, the national authorities have tightened capital requirements to the same extent but in a different way. Sweden, Norway and Finland have introduced minimum risk weights for private residential lending and various types of business property financing. Also, the risk weights for residential lending in growth areas have been increased in an attempt (combined with stricter borrowing requirements) to curb property price rises.
2018 – 2021	The EU has proposed a fifth Capital Requirements Directive and a second Capital Requirements Regulation. The proposals mainly implement new Basel III recommendations for a capital requirement for market risk (Fundamental Review of the Trading Book – FRTB) and a stable funding requirement (Net Stable Funding Ratio – NSFR). The proposals will imply higher capital requirements for market risk and will provide SIFIs with an incentive to introduce a new type of market risk models and management over the coming years. The new models require stressing covered bond yield spreads to government bonds by 2 percentage points, which is about three times more than experienced by Nykredit during the financial crisis. The Danish resolution authorities (the Danish FSA and Finansiel Stabilitet), with Danmarks Nationalbank as a consultation partner, are to determine the aggregate MREL requirement.
2021-	In 2015 the Basel Committee initiated the finalisation of the Basel III reforms, ie a revision of the determination of risk-weighted exposures according to the standardised approach and using IRB models. The Basel Committee's proposals turned out to be so fundamental that markets dubbed them "Basel IV". Especially the recommendations on a new capital floor for the application of IRB models based on the standardised approach will have significant consequences for Danish mortgage banks. The Basel Committee is expected to introduce risk-weighting floors any time soon. It seems likely that an output floor of 70-72% of the standardised approach will be agreed, along with a number of so-called parameter floors, ie minimum requirements for the risk parameters applied in risk models. Also, discussions are ongoing about a potential relaxation of the market risk framework. According to calculations by an expert group of the Danish FSA, Basel IV and the new EU capital regulatory framework proposed in November 2016 will lead to substantial rises in capital requirements for residential

	lending, for market risk and for lending to large corporates. For Nykredit, REA will rise by about DKK 100bn. The rules will subsequently have to be adopted by the EU. Nykredit expects market standards for capital levels to change quickly and derogate from the transitional rules. This is what happened when Basel II and Basel III were implemented. The new capital requirements are currently expected to become market standard in 2020 or 2021, and the Danish FSA's capital assessments under the proposed investor-based model are based on these expectations.

Appendix II: The capital target requirements of the Danish FSA – a letter to Nykredit

Extract from the Danish FSA's letter to Nykredit dated 27 September 2017 [translation by Nykredit].

Capital targets and stress testing

It is the opinion of the Danish FSA that the capital targets of a SIFI must be sufficient for the SIFI to be able to fulfil capital requirements, including buffer requirements, under a severe stress. For the purpose of the next ICAAP report, please describe Nykredit's response to this, including the Group's possibilities of raising capital in a non-listed scenario and any consequent additional buffer requirements, cf below.

Discussions are still ongoing between Nykredit and the Danish FSA as to whether the results returned by Nykredit's latest macroeconomic stress test models are sufficiently conservative. The Danish FSA expects Nykredit to allow for the outcome of these discussions in next year's ICAAP stress testing.

The results obtained by Nykredit in the Danish FSA's macroeconomic stress tests (August 2017) indicate that, as a listed undertaking, the Nykredit Group's capital targets should currently be a CET1 capital ratio of at least 14% and a total capital ratio of at least 19% for the purpose of meeting the fully loaded capital requirements (excluding a countercyclical capital buffer) in a severe stress scenario. More stable capital targets, allowing for varying stress test results over time, would be a CET1 capital ratio of 14.5% and a total capital ratio of 19.5%.

In this context, capital targets mean the capital targets that a credit institution has announced publicly. The current capitalisation of most institutions is somewhat higher than their announced capital targets in order to avoid the risk of not meeting the announced targets because of unforeseen events.

The above calculations factor in an estimated reduction of 0.2 percentage points from Nykredit's capital ratios in the stress tests to ensure sufficiently conservative results. It should be borne in mind, however, that the technical discussions of the stress test results are not yet concluded.

These results do not by default factor in any distributions to the parent in stress scenarios. If elements of the business model call for financial leeway to make distributions even in such situations, the current excess coverage relative to the announced capital targets should be higher, cf below. Nykredit should consider this in relation to, for instance, the KundeKroner benefits programme.

When determining its capital targets, the individual credit institution should also consider whether, besides factoring in the statutory capital requirement and the stress test results, the capital targets should include an additional capital surcharge. The need for an additional surcharge depends on many factors, including:

- *Capital flexibility (established access or lack of access to new capital)*
- *Dividend policy*
- *Stress test quality*
- *Capital structure, including the risk relating to the refinancing of subordinate loan capital*
- *Other institution-specific factors, including in particular the business model*
- *Upcoming regulatory changes relevant to the determination of capital targets (MREL, IFRS 9, Basel IV).*

Some credit institutions will not need a surcharge, while others will need a significant one. The institution will make an initial assessment of this need, subject to review by the Danish FSA.

Especially as concerns capital flexibility, the Danish FSA finds that insufficient flexibility calls for a capital surcharge of 3-3.5 percentage points.

This surcharge should be viewed in light of past experience indicating that during a crisis, SIFIs may need to bolster their capital position in order to maintain their lending capacity. An unlisted SIFI should therefore generally have higher excess coverage due to its poorer access to capital. Nykredit already had such excess coverage before the latest crisis and was therefore able to increase lending in Denmark during the crisis.

The need for a capital surcharge due to the lack of capital flexibility can be determined in two ways, which both indicate this same level:

- *Which amount of capital did SIFIs raise during the financial crisis to be able to maintain their lending capacity?*
- *SIFIs will be unable to maintain market confidence if they are undercapitalised compared with other SIFIs for a long period of time. This could give rise to difficulties in issuing, for instance, subordinate loan capital and senior secured bonds. Specifically, it is therefore assumed that a credit institution must catch up with other SIFIs in terms of capitalisation within two years after a severe stress. This is based on the assumption that other SIFIs also accept a minor temporary decline in capitalisation during a severe crisis. However, this did not generally seem to be the case during the financial crisis.*

As regards other institution-specific factors, including the business model, the capital targets must be aligned with the business model. For instance, Nykredit should be aware that all SIFIs are expected to have capital targets enabling them to maintain lending at all times. However, Nykredit's business model includes a more explicit ambition in this area, which calls for particularly prudent capital targets.

Appendix III: Glossary

CET1 capital	The highest quality of capital, often called share capital, is referred to in the capital requirement rules as Common Equity Tier 1 capital, or CET1 capital. CET1 is the highest quality of capital because the holders of this type of capital bear the first losses in case of a credit institution's insolvency and consequently demand the highest return. Most of the capital requirements must be met with CET1 capital.
Capital need	The capital need is Nykredit's internal guidance target which forms the basis for calculations of expected return etc. The capital need is slightly higher than the capital target to ensure a buffer sufficient to allow for dividend distribution, even in periods of minor operational or regulatory fluctuations.
Total capital ratio	The total capital ratio is defined as the amount of capital in DKKbn held by a credit institution divided by the institution's REA. If, for instance, Nykredit has DKK 70bn of CET1 capital and a REA of DKK 350bn, Nykredit has a CET1 capital ratio of 20%.
Capital target	The capital target is the formal level of capital required by the Danish FSA to approve Nykredit's capital and dividend policies. The capital target could therefore also be regarded as the minimum level required for Nykredit to be able to distribute dividend.
Risk exposure amount (REA)	The risk exposure amount (REA) is a credit institution's lending etc weighted by a risk weight reflecting the probability of loan defaults and the risk of loss in case of default.
Stress test	A stress test includes model calculations where a credit institution's lending is exposed to various negative effects (stressed). Typical effects will be a rise in unemployment, declining housing prices, increasing interest rates etc. Based on this, an analysis is performed of the rise in the institution's REA and the amount of capital lost in different scenarios.
Management buffers	Additional buffers added by a credit institution to the statutory or regulatory requirements to prevent minor fluctuations in capital ratios as a result of the development in eg property prices, changing regulation etc from causing the institution to breach the statutory or regulatory requirements.
Systemically important financial institution (SIFI)	A systemically important financial institution (SIFI) is a financial institution designated by the Danish FSA as particularly important to financial stability in Denmark, which must consequently meet higher capital requirements than other institutions.
Two-tier mortgaging	Nykredit introduced two-tier mortgaging in 2012. Two-tier mortgaging implies funding all loans partly by CRD-compliant mortgage covered bonds (SDOs), partly by UCITS-compliant mortgage covered bonds (ROs). The difference between the two types of bonds is that in case of SDOs, credit institutions must provide supplementary collateral if the property price subsequently drops below the price prevailing at the time the

	loan was issued (if the LTV exceeds statutory limits). A similar requirement does not apply to ROs. The introduction of two-tier mortgaging reduced the need to post supplementary collateral, as SDOs may only be used to fund up to 60% of the mortgageable value. Today Nykredit only applies two-tier mortgaging for business loans.