BASEL AND THE DANISH FINANCIAL SYSTEM

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WHY WE ARE SCEPTICAL ABOUT THE BASEL PROPOSALS

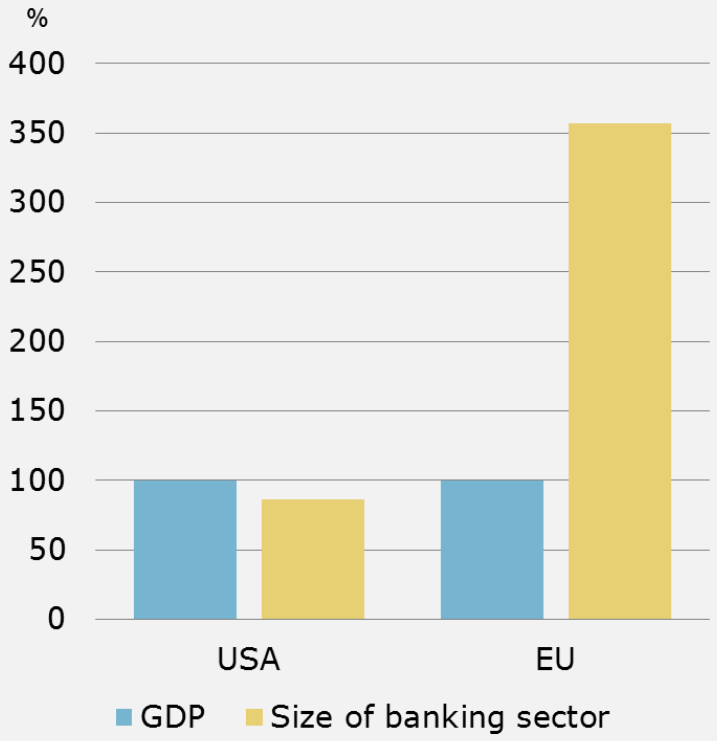
Different financial systems

The US model

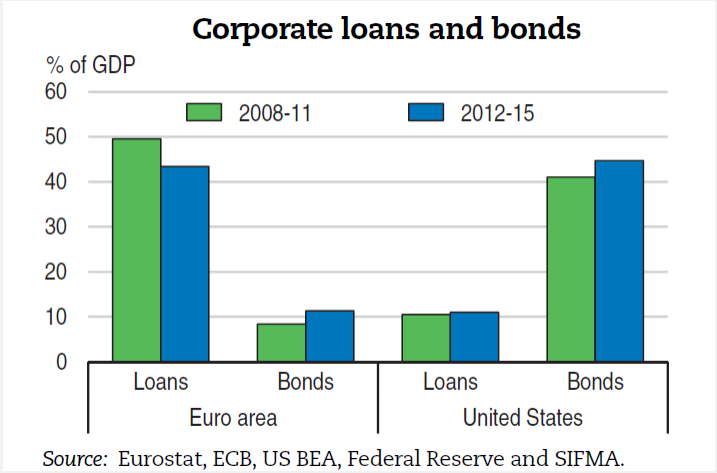
The European model

The banking sector significance in the EU

Relative size of the banking sector



Coporate loans and bonds

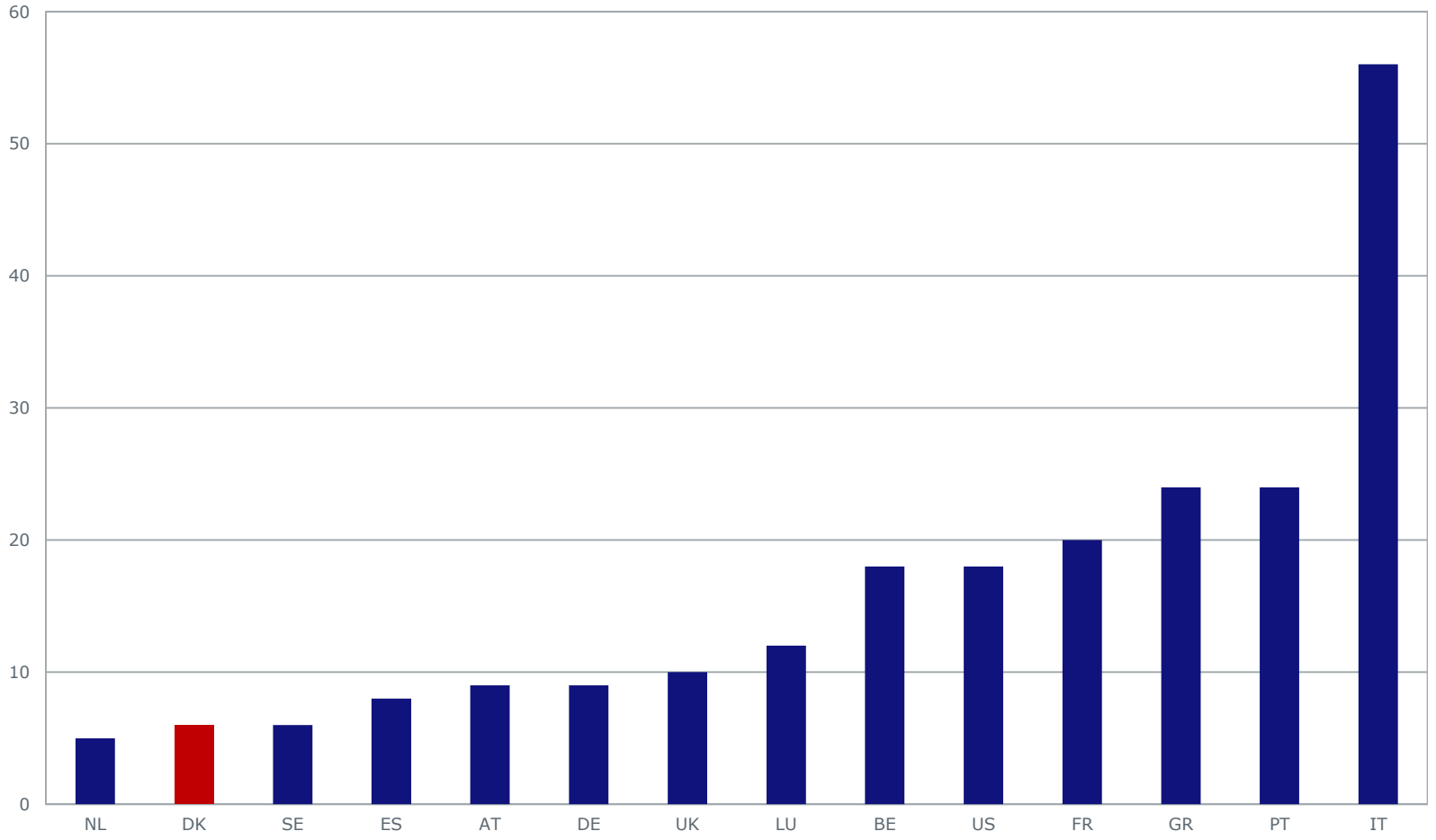


Source: Danish FSA, April 2016

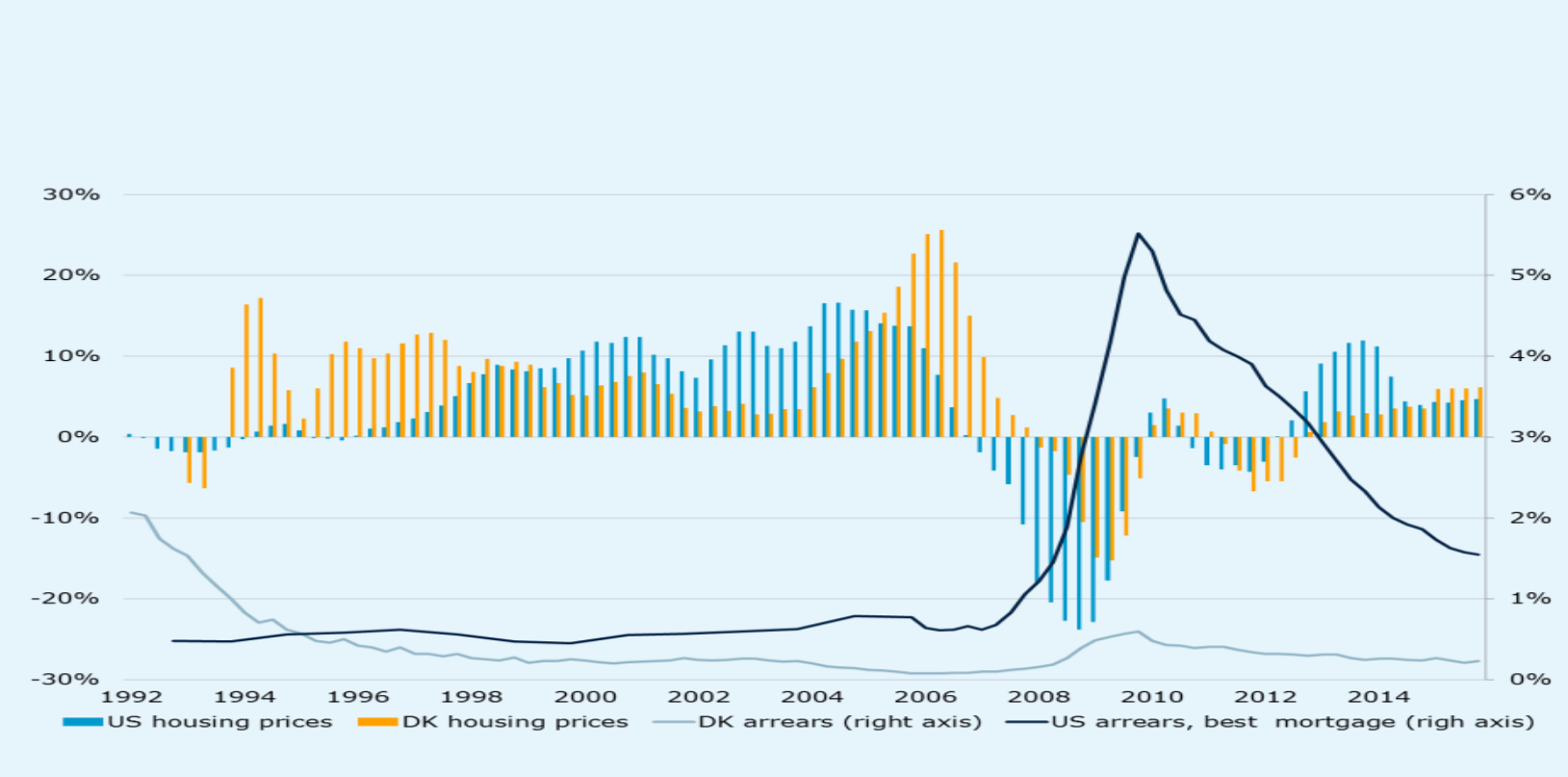
A risk based approach can reflect local conditions affecting mortgage loans

- Creditor protection (no ”walk away” option in Europe)
- Efficient foreclosure processes
- Reliable property valuation
- Social security, pension systems
- Higher taxes vs. welfare goods (e.g. free education, health care)

Average time to foreclose (months)

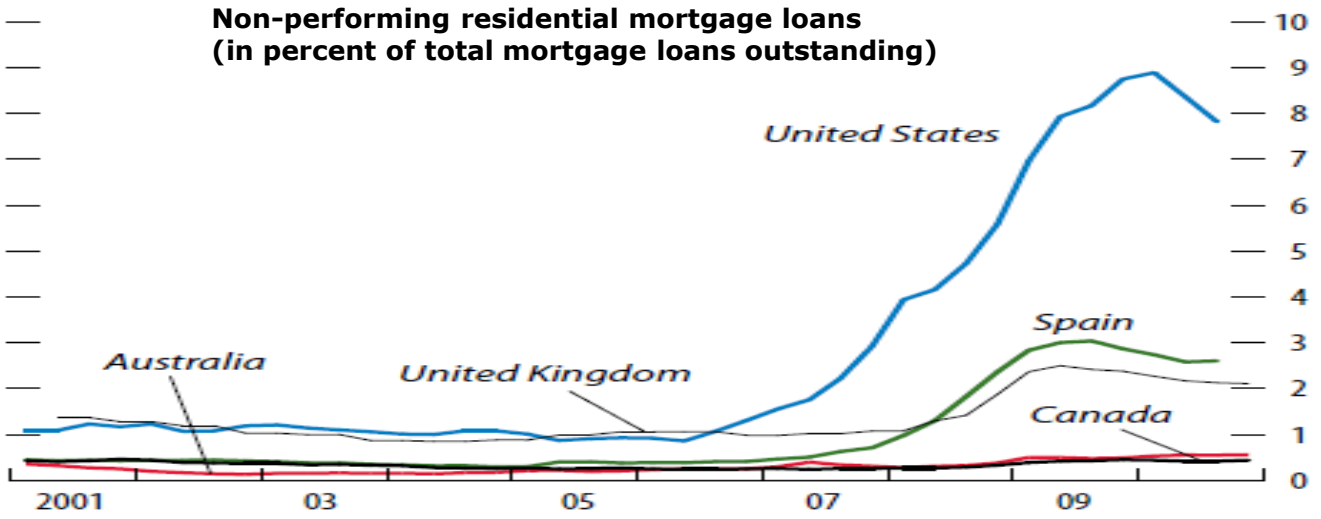


US and Danish housing prices and arrears



Source: US housing prices are a Case-Schiller price index. Danish housing prices are a one-family house price index from Statistics Denmark. US arrears (best mortgage) are Fannie Mae delinquency rates and US arrears (subprime) are Bloombergs Mortgage Delinquency Rate Subprise 90+.

Housing markets – very different conditions



Sources: Federal Reserve Bank of New York; Reserve Bank of Australia; Bank of Spain; U.K., Council of Mortgage Lenders; and Lea (2010b).
Note: Nonperforming loans that are more than 90 days in arrears. For Australia, Canada, and the U.S., banks only.

RISK WEIGHTS

Risk Expositions
IRB method – complicated calculation

For each loan the institute themselves estimate following parameters:

PD: **Probability of default**, e.g. 5 %.

LGD: **Loss-Given-Default – loss on loan in case of default**, e.g. 40 %.

M: **Duration,** e.g. 3 years.

The estimates: PD, LGD and M are put into a standard formula (set by the Basel Committee), that calculates the risk weight, RW, on the loan, e.g. 25 %.

REA for the loan is found by multiplying the loan amount with the calculated risk weight, RW, on the loan.

$$RW = \left(LGD \cdot N\left(\frac{1}{\sqrt{1-R}} \cdot G(PD) + \sqrt{\frac{R}{1-R}} \cdot G(0.999) \right) - LGD \cdot PD \right) \cdot \frac{1 + (M-2{,}5) \cdot b}{1 - 1{,}5 \cdot b} \cdot 12{,}5 \cdot 1{,}06$$

hvor

N(x) = den kumulative fordelingsfunktion for en standardiseret normalfordelt stokastisk variabel (dvs. sandsynligheden for, at en normalfordelt stokastisk variabel med middelværdi 0 og varians 1 er mindre end eller lig med x)

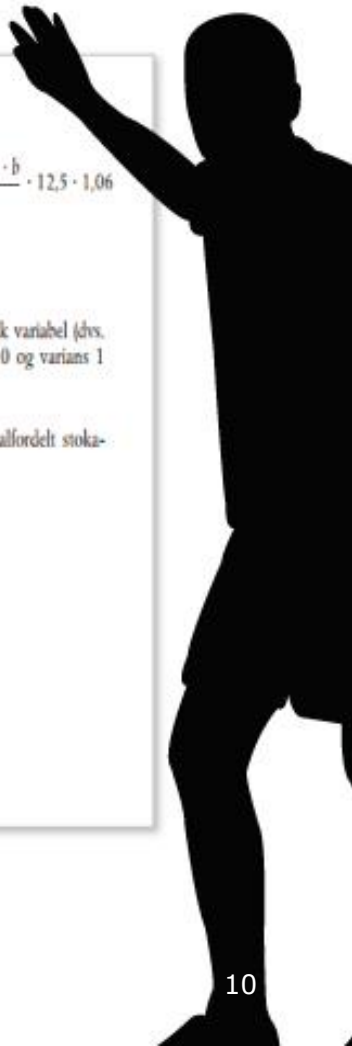
G (Z) = angiver den inverse kumulative fordelingsfunktion for en standardiseret normalfordelt stokastisk variabel (dvs. den x-værdi, for hvilken det gælder, at N(x) = z)

R = angiver korrelationskoefficienten, der defineres som

$$R = 0.12 \cdot \frac{1 - e^{-50 \cdot PD}}{1 - e^{-50}} + 0.24 \cdot \left(1 - \frac{1 - e^{-50 \cdot PD}}{1 - e^{-50}} \right)$$

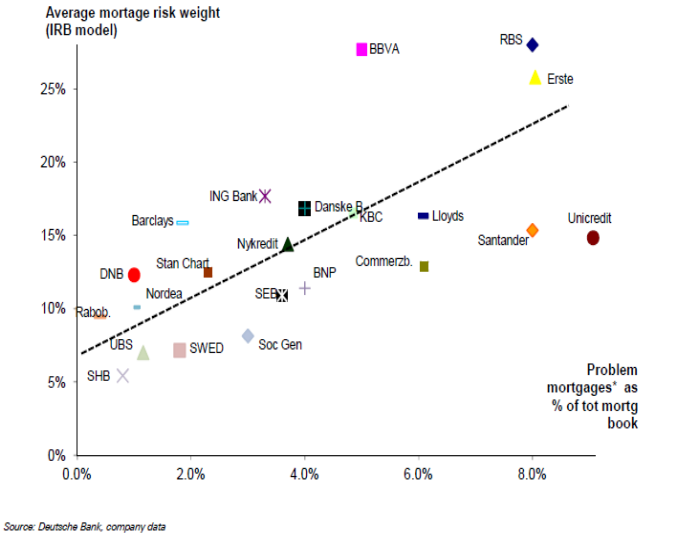
b = løbetidsfaktoren, der defineres som

$$b = (0.11852 - 0.05478 \cdot \ln(PD))^2$$



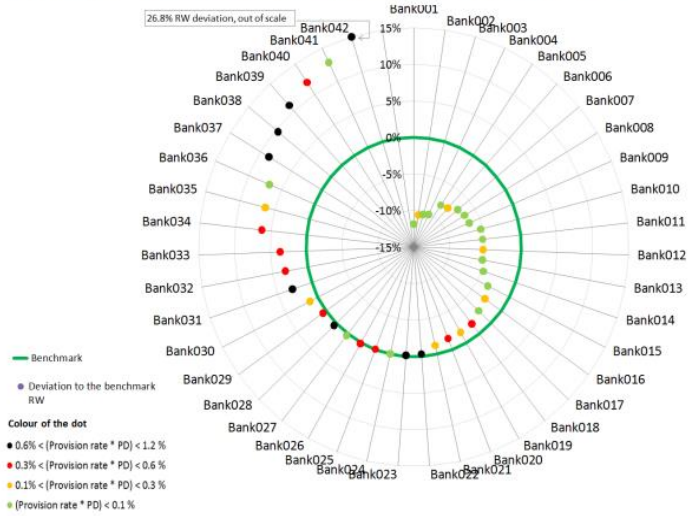
IRB-model mortgage RWs are good indicators of risk

Figure 5: Banks with lower average mortgage RWs have generally a significantly lower proportion of problem loans – credit quality explain variation in mortgage RWs across EU



Source: Deutsche Bank, company data

Figure 14: RW deviation from the benchmark RW (non-defaulted exposures) and comparison with the estimated 'experienced loss rate' (EAD-weighted PD for non-defaulted exposure times the provision rate (provisions/EAD) for defaulted exposures), IRB RM portfolio, by bank



Note: Banks are sorted by their RW deviation.

Source: EBA data collection (reference date: December 2012), EBA calculation

Basels' proposal for SA RRE RWs for low risk jurisdictions are way above the EU IRB benchmark

Dependent on cach flows generated by the property?

No:		Yes:	
LTV	RW	LTV	RW
[0-40%]	25 %	[0-60%]	70 %
[40-60%]	30 %		
[60-80%]	35 %	[60-80%]	90 %
[80-90%]	45 %	[> 80 %]	120 %
[90-100%]	55 %		
[>100%]	100 %		

EU Benchmark RW by drill-down variables Country ave RRE RWs in 2012

ILTV		LTVO	
Buckets	RW	Buckets	RW
[0-50%]	7%	[0-50%]	7%
[50-60%]	8%	[50-60%]	8%
[60-70%]	10%	[60-70%]	10%
[70-75%]	11%	[70-75%]	10%
[75-80%]	13%	[75-80%]	14%
[80-85%]	15%	[80-85%]	15%
[85-90%]	17%	[85-90%]	17%
[90-95%]	20%	[90-95%]	20%
[95-100%]	21%	[95-100%]	19%
[100-105%]	24%	[100-105%]	17%
[105-110%]	24%	[105-110%]	16%
[110-120%]	25%	[110-120%]	20%
[120-150%]	28%	[120-150%]	13%

THE BENEFITS OF RISK-SENSITIVE CAPITAL REGULATION

The case for risk-sensitive capital regulation

Regulating capital via a simple capital to asset ratio incentivizes banks to hold portfolios with more risky assets (Koehn and Santomero (1980), Kim and Santomero (1988)).

Capital regulations with little risk sensitivity share a “flat tax” feature and incentivize banks to increase asset risk within each risk category, thus leading to a distortion in the allocation of credit (Behn et al. 2016a, 2016b).

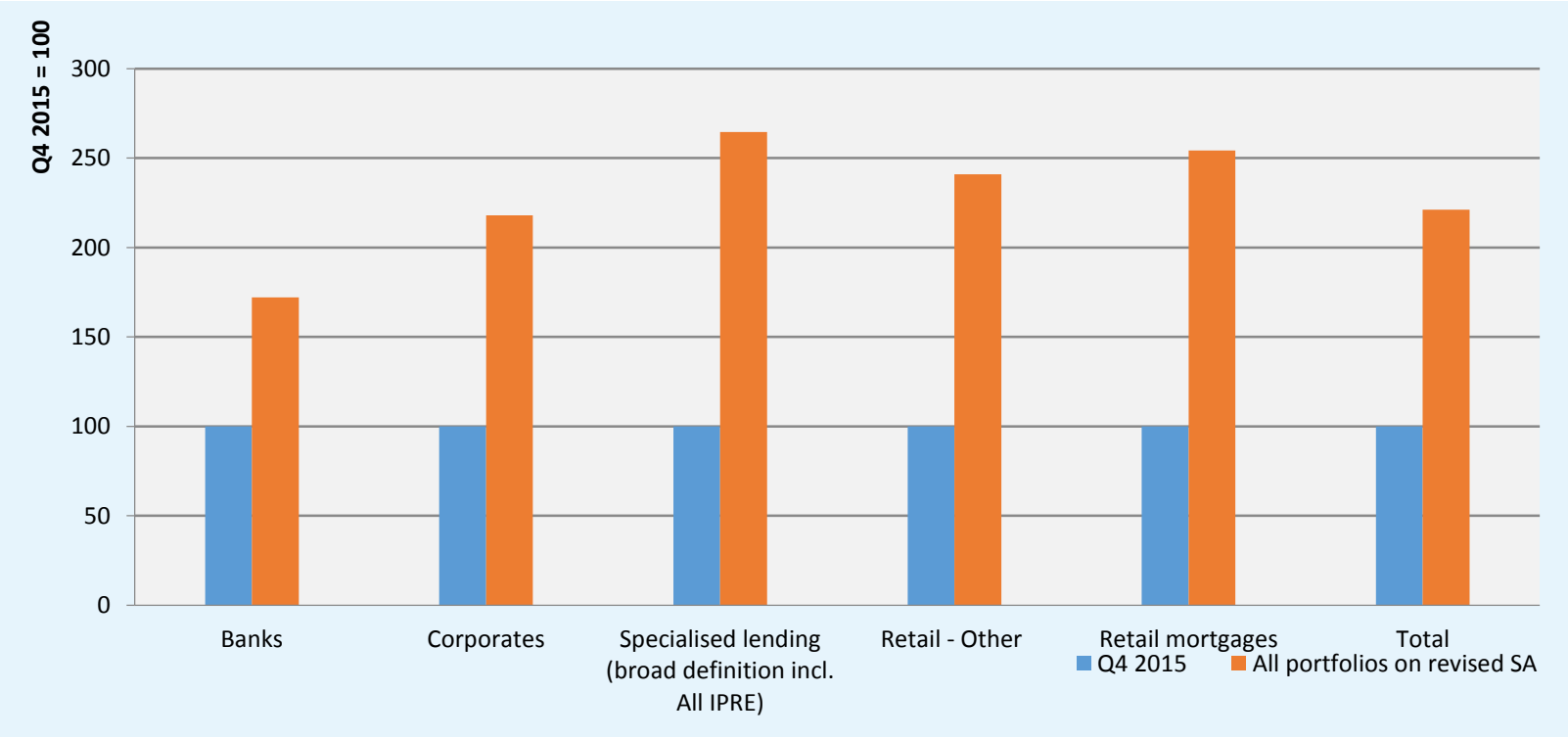
The benefits of risk-sensitive capital regulation

IRB based RWA measures have two main advantages compared to the Basel II standard approach (SA). The Basel Committee on Banking Supervision (BCBS) considers the lack of granularity and risk sensitivity in SA as "one of the key weaknesses of the current SA."

- Granularity is low under the standard approach because all exposures are lumped into few risk categories. Within a risk category, exposures are treated the same. For example, all corporate loans to customers without a rating from a recognized external rating agency receive the same risk weight (RWA of 100%). As a result, the capital adequacy regulation does not reward a bank that has carefully selected low risk customers within a given risk category.
- IRB models are more risk-sensitive in the sense that the bandwidth between the RWA of low risk and high risk customers is larger when banks use IRB models. For example, the RWA for corporate loans varies between 20% and 150% in the SA. The bandwidth of a typical IRB model may range from 10% to 250%. The increased risk sensitivity of IRB models has the consequence that banks achieve larger rewards from implementing a low risk strategy.

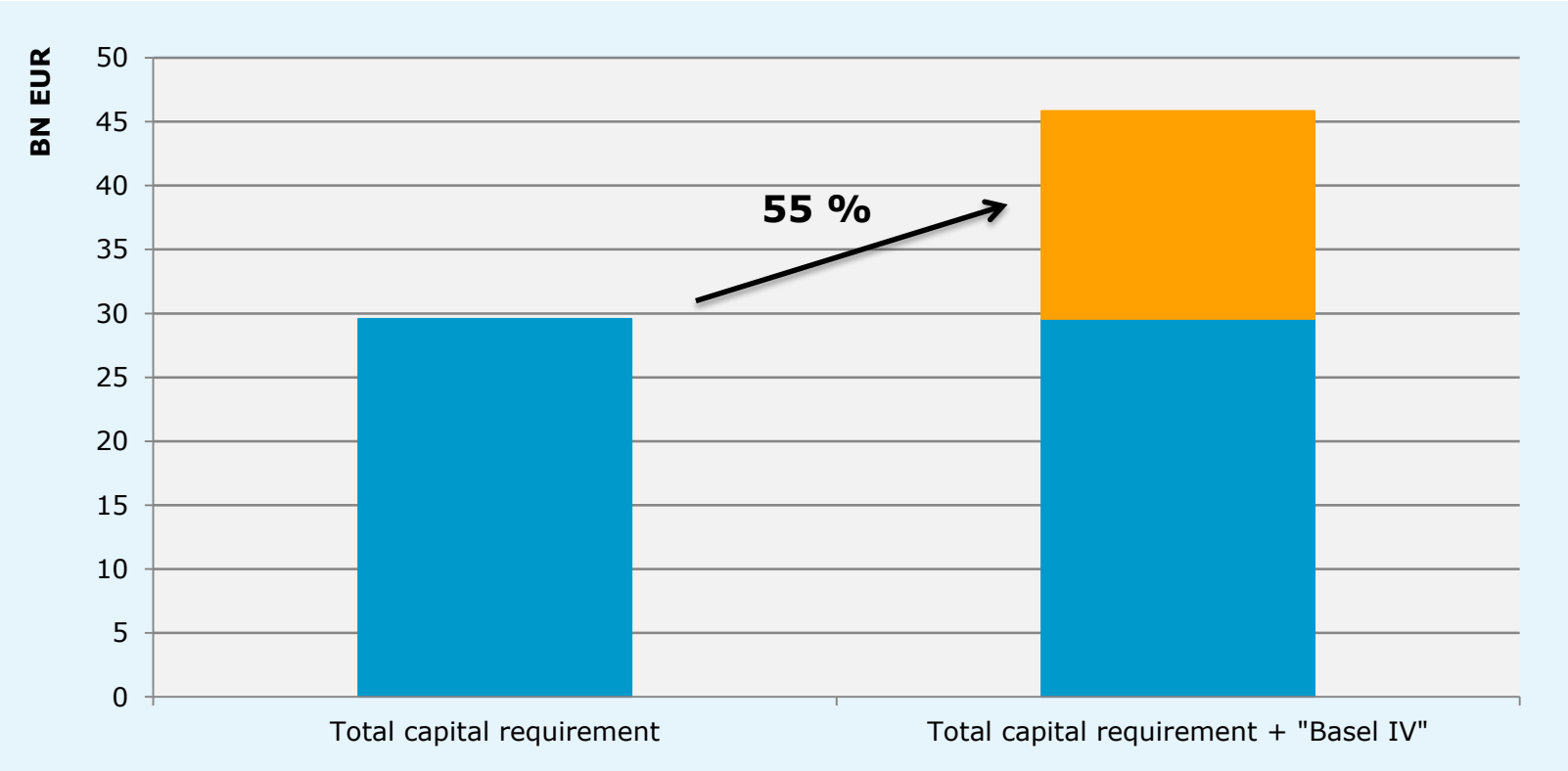
BASEL IV
IMPACT STUDY

The Danish system is highly vulnerable to the proposed floors framework



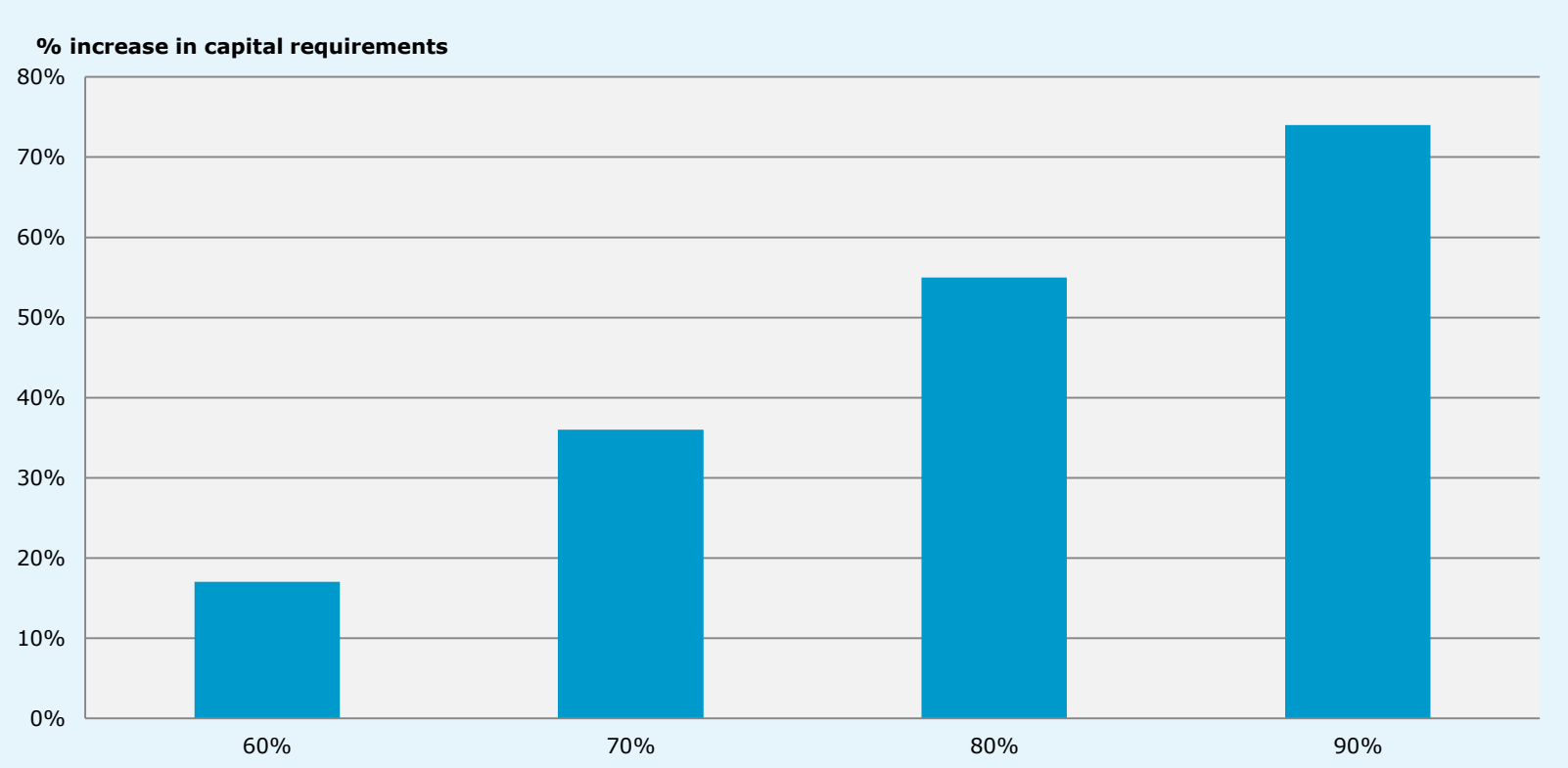
Note: Impact on credit REA for four Danish IRB institutions (Nordea DK and Jyske Bank excluded in portfolios, but not in total). Q4 2015 is the combinations of SA and IRB.
Source: Members reporting to/and Danish Bankers Associations calculations.

Additional capital to meet expected requirements with a 80% floor



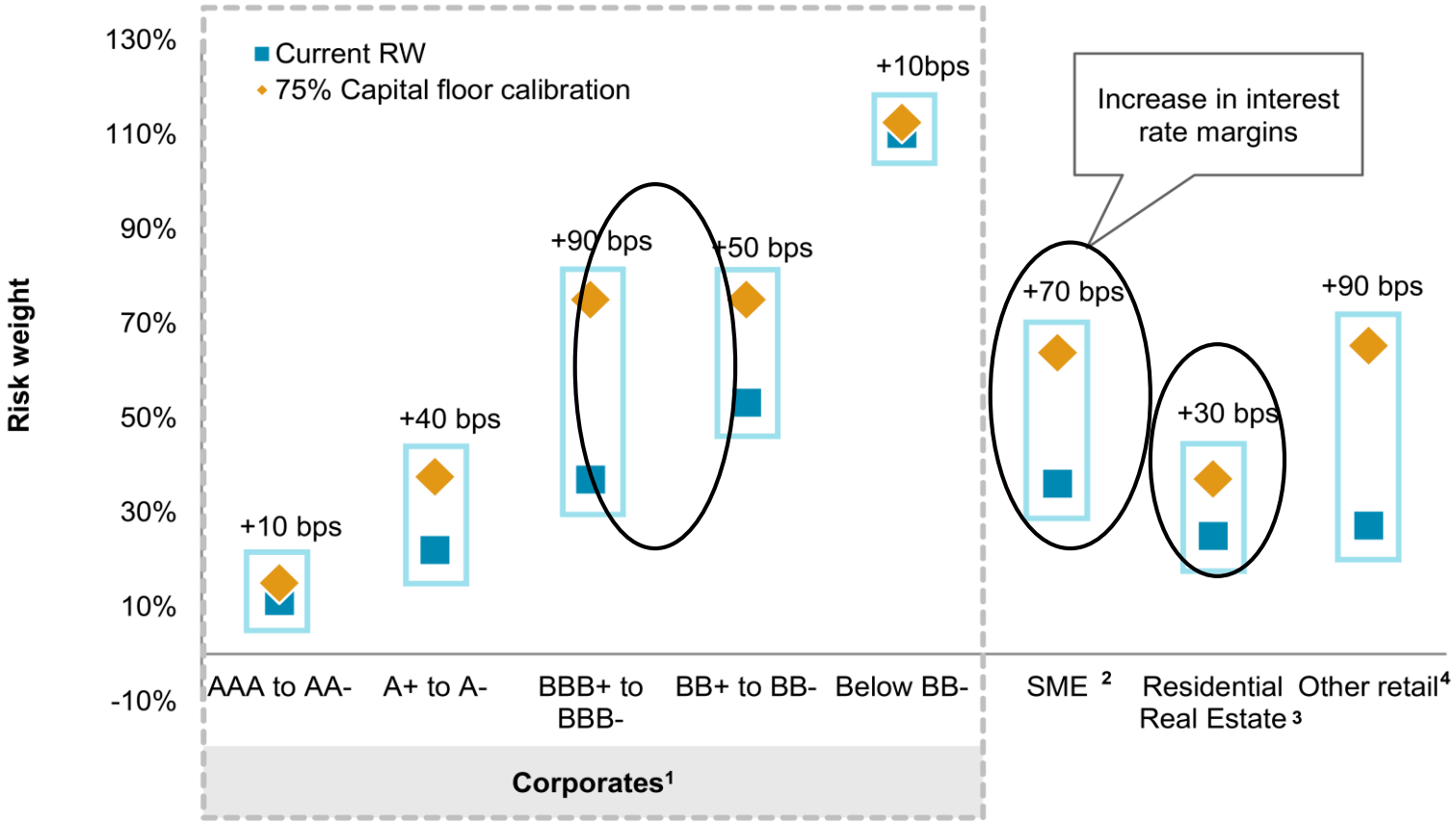
Note: Based on credit REA for 6 Danish IRB institutions. 2015 numbers. See the appendix for more details.
Source: Banks reporting to/and Danish Bankers Associations calculations.

Additional capital to meet expected requirements – the increase depends on floor levels



Note: Based on credit REA for 6 Danish IRB institutions. 2015 numbers. See the appendix for more details.
Source: Banks reporting to/and Danish Bankers Associations calculations.

Capital floors increase Swedish interest rate margins



Source: Oliver Wyman

Permanent effects of higher capital requirements

Higher capital requirement increases banks' funding costs

This decreases total lending and thus investments

Which compresses:

* GDP
* Productivity
* Average wages

Source: Copenhagen Economics

KEY MESSAGES

- The proposal for a permanent capital floor will effectively abolish the risk based approach for capital requirements for banks operating in low risk environments.

- We regard this as a major set back that will potentially have negative effects on banks' incentives for improving models and risk management.

- Furthermore, we regard the proposal as it stands as unnecessary given
  - the expected introduction of a minimum leverage ratio by 2018
  - the current possibilities to address model risk under Pillar 2
  - the initiatives underway in Basel and the EBA to enhance confidence in the application of IRB models (bench marking, harmonisation of modelling assumptions, data requirements and parameter definitions)

- IRB banks and banks in jurisdictions that operate under well functioning mortgage systems and in comparably safe economic conditions will be severely hit by the proposed capital floor. This will adversely affect the conditions for financing housing and corporates in these economies.

Appendix: Method behind impact method

Reporting to Danish Bankers Association from all Danish IRB institutions on group level

- Nordea Bank Denmark
- Jyske Bank
- Nykredit
- Sydbank
- Danske Bank
- Lån & Spar Bank

Provides us with Q4 2015 data on

- Current REA on SA and IRB approach
- From the majority detailed on exposure classes
- REA on revised SA and IRB
- IRB REA as if SA and with impact from REA floors
- Basel 1 floor on credit REA
- Credit risk exposures, as well as market and operational risk

Allows us to estimate impacts on

- What is the binding constraint: Revised IRB/SA or floors framework?
- What is the binding constraint: Basel 1 floor or current total capital requirement?
- Sector impact from output floors in the span 60-100 %

Main assumptions

- The impact is estimated as the difference between current and future capital requirements for each individual institution
- Current capital requirement is 8 % + buffers + Pillar 2
- Future capital requirement is 8 % + buffers + ½*Pillar 2
- Buffers are SIFI + conservation buffer (hence counter cyclical buffer is set at 0 %)
- Pillar 2 is a binding constraint, if floor is above 60 %
- Pillar 2 add on is halved in the future due to the assumption, that some thing will be contained in pillar 1, while other things will not (risk outside the trading book etc.).
- The impact is estimated in CT1 capital (mainly equity)
- Output floor on total credit REA, as well as market and operational risk (hence on a risk level)
- The floor is calulated on total REA on SA
- Basel 1 floor only taken into account on credit REA

Appendix: An example

The Basel 1 floor currently is the binding constraint, if…	*8%*80%*Basel 1 REA > (8%+buffers +pillar 2)*Current REA*
If the Basel 1 floor currently is the binding constraint, the additional capital requirement is…	*Max[0;Floor*REA on revised A*(8%+buffers+½*pillar 2) – 8%*80%*Basel 1 REA]*
If the Basel 1 floor currently is not the binding constraint, the additional capital requirement is…	*Max[0;Floor*REA on revised A*(8%+buffers+½*pillar 2) – (8%+buffers +pillar 2)*Current REA]*

The new floor vs existing Basel I floor

- Basel I floor is a transitional, separate, back stop measure for capital (according Art. 500 of the CRR)
- No buffers on top
- New floor is a permanent RWA-floor – a fully integrated Pillar 1 minimun capital requirement
- Integrated with other capital meaures – Pillar 2, buffers and MREL/TLAC
- Based on the proposed revised Standardised Approach which penalises high LTV loans (typical for mortgage loans in low risk countries)