Institute and Faculty of Actuaries

Battle of the Balance Sheets

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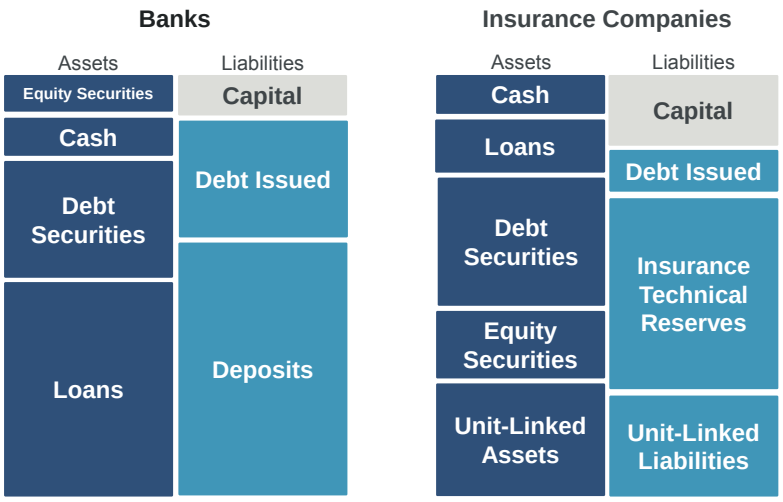
Agenda

- **Risk-based capital requirements:** Banks vs. Insurers
- **Available capital**
- **Case study:** Corporate bond investment
- **The future**

Overview | Balance Sheet Comparison



Hypothesis

- Under an **arbitrage-free** financial system:
  - Different institutions will have the **same capital requirements** for the same risk
  - No reason for **internal risk transfers** within financial conglomerates
  - Institutions can compete **across lines of service**

Alternative Hypothesis

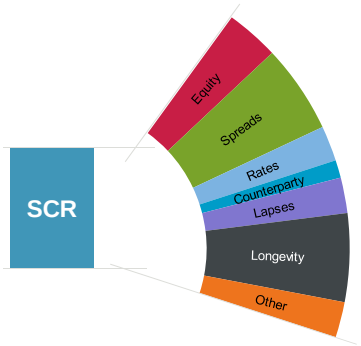
- Activities performed by **different institutions** need to be regulated differently
- Capital is a **scarce resource**:
  - Deployment is **guided by regulation** but **driven by business model**

Risk-Based Capital Requirements

Insurers | Capital Requirements

Insurers under Solvency II

- The **Solvency Capital Requirement**, SCR shall correspond to the Value-at-Risk of the Basic Own Funds of an insurance or reinsurance undertaking subject to a confidence level of 99.5% over a one-year period.



Source: Directive 2009-138-EC

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Banks | Basel III Implementation in Europe

Basel III (2010)

CRD IV (2013)

CRR

Pillar 1

- Capital
- Leverage
- Liquidity

CRD

Pillar 2

- ICAAP
- SREP
- Buffers

ICG

PRA Buffer

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Banks | Regulatory "Pillars"

PILLAR 1 Minimum Capital and Liquidity Requirements	PILLAR 2 Supervisory Review Process	PILLAR 3 Market Discipline
Risk-weighted assets: • Credit • Market • Operational	Supervision and risks not covered by Pillar 1: • Internal capital adequacy assessment process (ICAAP) • Stress tests	• Transparency and comparability • Enhanced disclosures

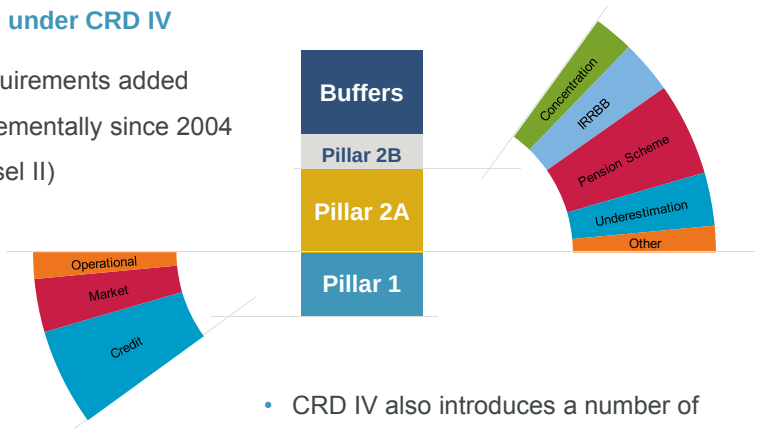
Banks | Pillar 2

Pillar 2A	**Individual capital guidance** and risks not covered (at all, or fully) in Pillar 1. For example: • Credit concentration risk • Interest rate risk in the banking book (IRRBB) • Pension scheme risk • Under-estimation risk (e.g. operational)
Pillar 2B	**Stress tests** review a bank's ability to withstand a supervisor-defined stress event

Banks | Capital Requirements

Banks under CRD IV

- Requirements added incrementally since 2004 (Basel II)

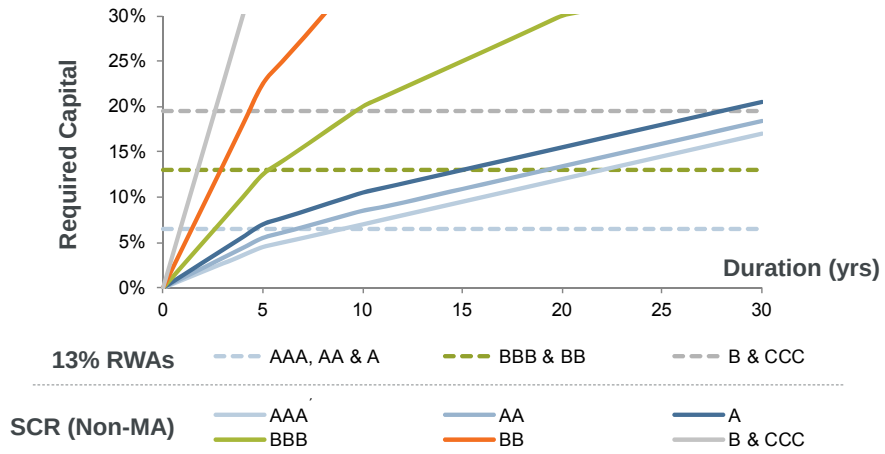


- CRD IV also introduces a number of additional **capital buffers**

Capital Requirements | Comparison

	Solvency II	Capital Requirements Regulation
Overview	• SCR aims to cover all material risks • Risk-weighting based on expected change in risk factor	• Static risk weights for key risks • Must withstand regulator-defined stress tests • Additional non-risk-based requirements and buffers
Diversification	• Correlation between risk factors	• Summation of capital charges across risk modules
Calibration	• 99.5th%ile 1-year VaR • Balance sheet	• Inconsistent across risk modules • Assets-only

Case Study | Corporate Bonds



Source: Solvency II Standard Formula

Available Capital

Regulation | Capital Adequacy

Capital = Assets – Liabilities

Solvency | Available Capital

Banks	Insurers
IFRS equity	IFRS equity
- intangibles	- intangibles
- expected losses	+/- valuation differences (incl. risk margin)
Common equity tier 1 (CET1)	+ future profits
+ other regulatory capital	+ other regulatory capital
Total Capital	**Available Own Funds**
- eligibility restrictions	- eligibility restrictions
Total Eligible Capital	**Eligible Own Funds**

Case Study: Corporate Bond Investment

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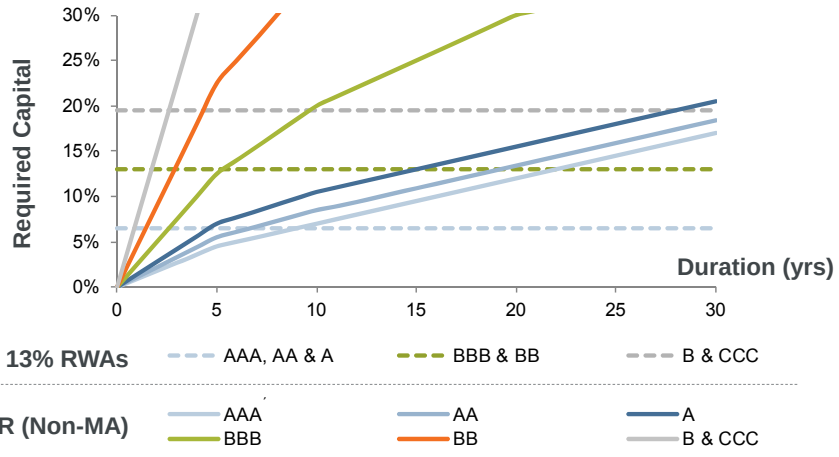
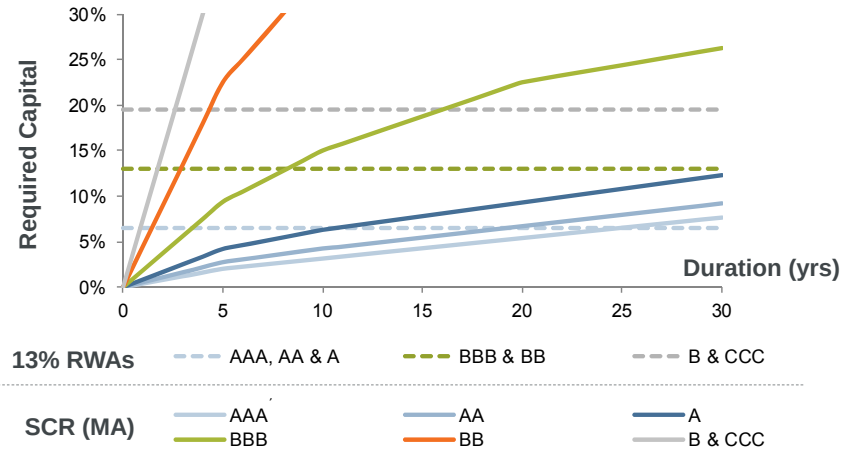
Case Study | Corporate Bonds (Non-MA)



Source: Solvency II Standard Formula

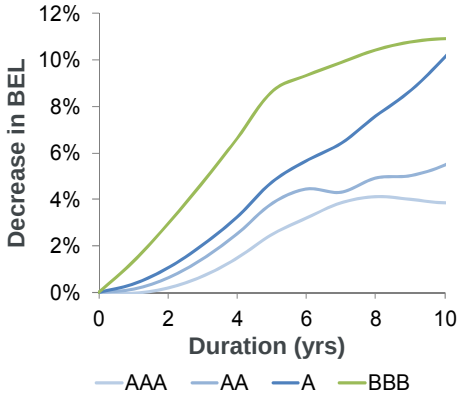
Case Study | Corporate Bonds (MA)



Source: Solvency II Standard Formula

Case Study | Corporate Bonds (MA)

Net Impact = SCR - Decrease in BEL

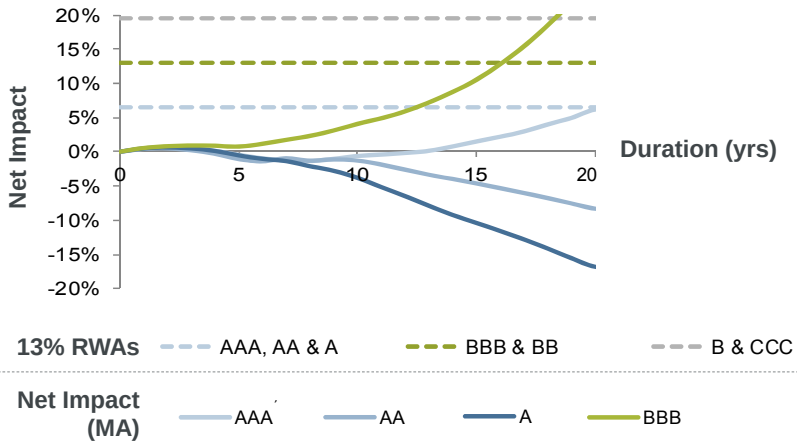


A-rated (Non-Financials)

Dur (yrs)	SCR	Decrease in BEL	Net Impact
1	0.8%	0.4%	0.4%
2	1.7%	1.1%	0.6%
3	2.5%	2.0%	0.5%
4	3.4%	3.2%	0.2%
5	4.2%	4.7%	(0.5)%
7	5.0%	6.4%	(1.4)%
10	6.3%	10.1%	(3.8)%

Source: EIOPA, RBS, iBoxx spreads as at 30-Sep-2016

Case Study | Corporate Bonds (MA)



Source: Solvency II Standard Formula, iBoxx, RBS

The Future

Other Regulatory Considerations | Banks

In addition to solvency capital, banks also have formal requirements for:

- **Leverage**
- **Liquidity**
- **Stable Funding**

Banks | Net Stable Funding Ratio

LCR focuses on short term, **NSFR on longer term stability**

- Compares term funding with term assets on a weighted basis

$$\text{NSFR} = \frac{\text{Available stable funding}}{\text{Required stable funding}} \geq 100\%$$

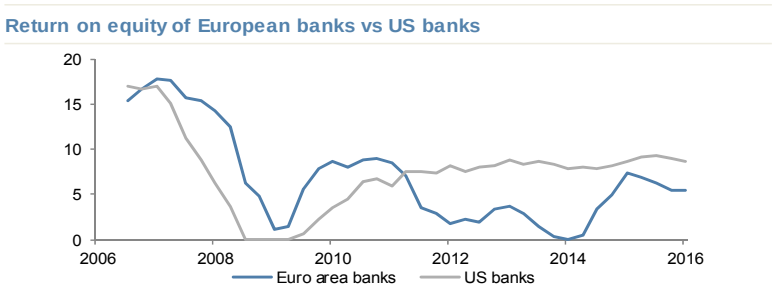
- Driver of banks **increasing term funding** or **reducing term assets**

Net Stable Funding Ratio | Examples

Asset	Maturity	RSF Factor
Residential mortgages	> 1 year	65%
Corporate loans	> 1 year	85%
AAA-AA Corporate bonds	All (unencumbered)	15%
A-BBB Corporate bonds	All (unencumbered)	50%

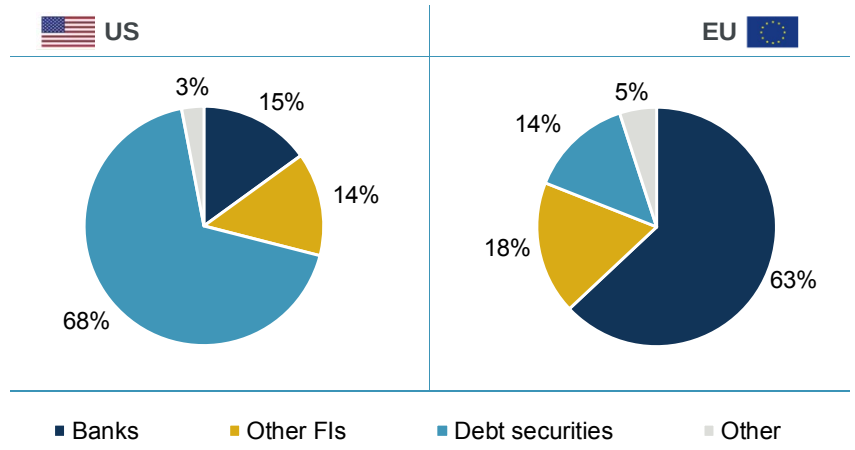
Liability	Maturity	ASF Factor
Retail deposits	< 1 year	90-95%
Regulatory capital	All, excl. <1Y Tier 2	100%
Funding / Other capital	< 1 year	0-50%
Funding / Other capital	> 1 year	100%

Banks | Europe vs. US



Source: Bloomberg.
Weighted average values for the Dow Jones EURO STOXX bank index and KBW bank index members.
RoE taken to be zero wherever negative

Europe vs. US | Loans Assets by Holder



Source: BNP Paribas

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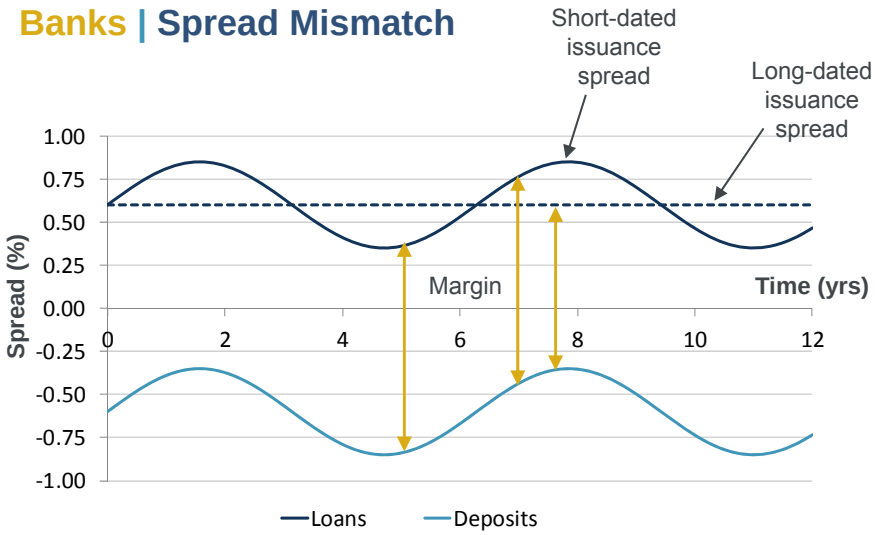
Banks | Spread Mismatch



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Summary

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Summary

- **Difficult** to compare regulatory regimes
- Initial hypothesis **does not** appear to hold
- **Insurers** are incentivised to match asset and liability duration
- **Bank** regulations seek to promote stability in the financial system

Questions

Comments

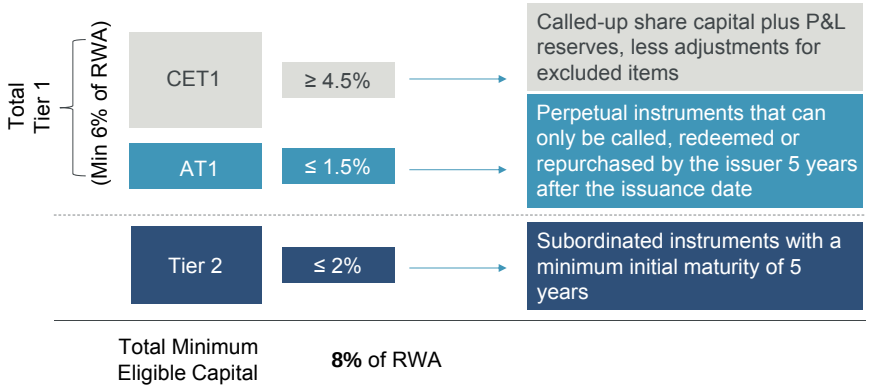
Appendix

Banks | Evolution of Capital Adequacy

- 1979 Banking Act - **Licensing**
- 1987 Banking Act - **Large exposure limits**
- Basel Accord (1988) - Credit risk **"risk-weighting"** (8% of RWAs)
- Basel II (2004). Broadened capital adequacy to include three "Pillars"
- Basel III – Implemented via CRR/CRD IV
- FRTB / "Basel IV"

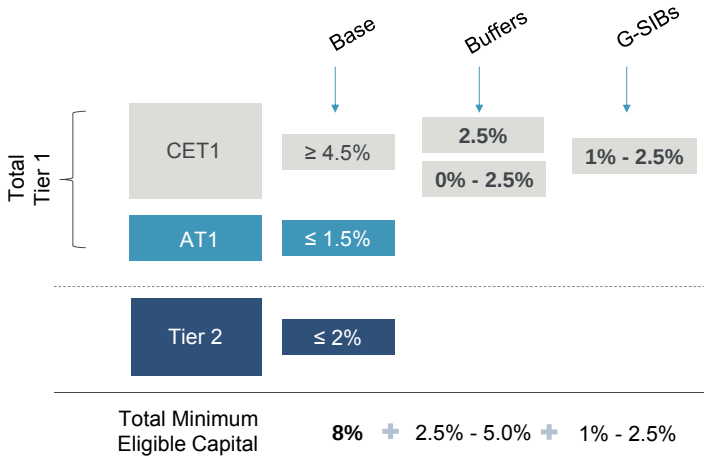
Capital Adequacy | Basel III

- Requirements expressed as a **percentage of RWAs**
- Requirements for **quality** of capital - CET1 is the most important



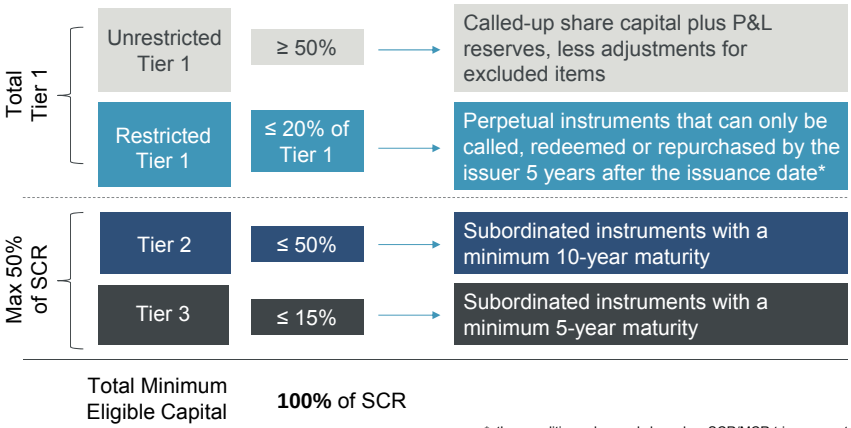
Capital Adequacy | Basel III

- Minimum capital requirements are bolstered by **buffers**:



Capital Adequacy | Solvency II

- Requirements expressed as a **percentage of SCR**



*other conditions also apply based on SCR/MCR trigger events