CQF: Certificate in Quantitative Finance

Regulation and Basel III / IV

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7th March 2023

Professor Dr Hermann Schulte-Mattler explains: “Currently, every European bank must observe approximately 40,000 legally binding requirements of the European Union. In the field of banking supervision, four thousand and one different rules have been set down on 34,019 pages … Today it is almost impossible to find any banking supervisor or bank practitioner who is able to explain exactly the supervisory rules and their consequences. The scope and complexity of the rules are just too great.”

Neisen M, Roth S. Basel IV: The Next Generation of Risk Weighted Assets. Wiley, 2017

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- Financial Regulation
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- The BIS and Banking Regulation
- Minimum Capital Requirements
- Liquidity Risk
- Case Study: The Internal Ratings Based Approach (IRB)

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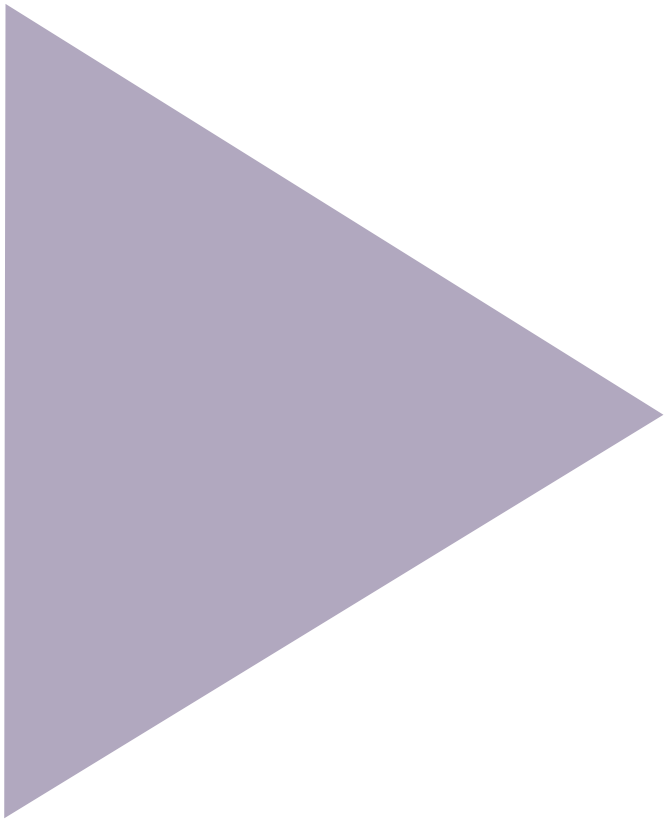

Financial Regulation

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Financial Regulation: Is it Possible?

The Tulip and Bulb Craze, 1634-1637 (first recorded ban regulation on short selling was enacted by the Dutch authorities as early at 1610).

Wall Street Crash: Black Tuesday (October 29, 1929)

The Fix: The Glass–Steagall legislation

The Improvemement(?): The Gramm–Leach–Bliley Act (GLBA) of 1999

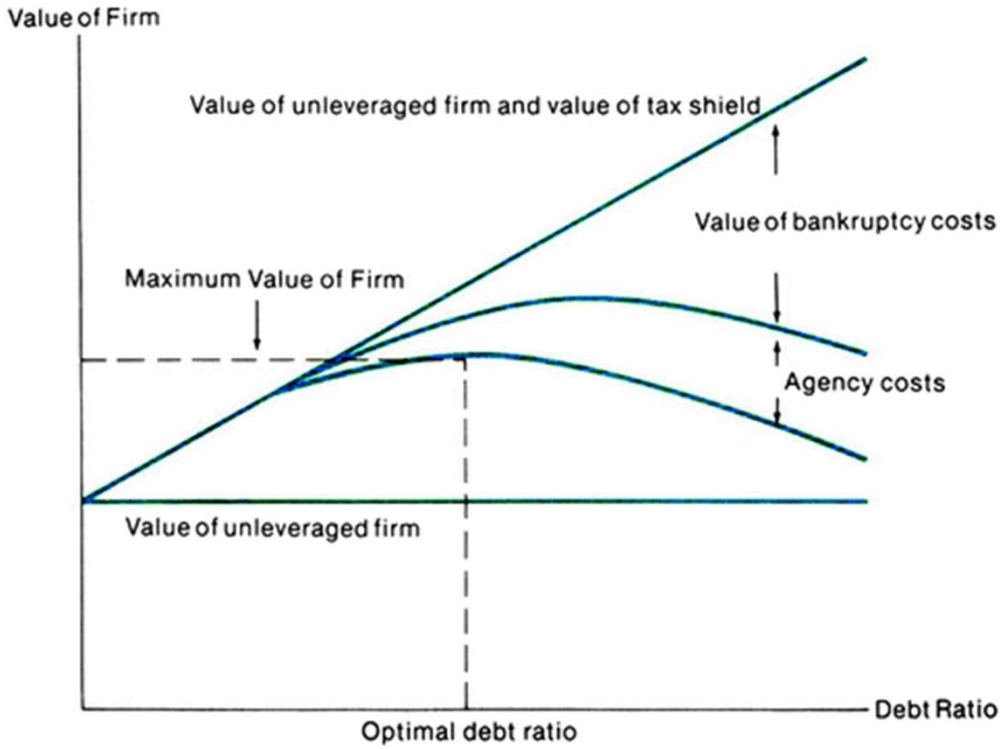
Global Financial Crisis (GFC) 2007 onwards

The Wall Street Crash of 1929

Financial Regulation: Is it Necessary?

Modigliani–Miller theorem (1958)

- In the absence of taxes, bankruptcy costs, agency costs, and asymmetric information, and in an efficient market, the value of a firm is unaffected by how that firm is financed



Types of Risk in Banks

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Risk Types and Capital in Banks

Major risk types:

- Credit (usually the main one)
- Counterparty (derivatives - may be defined as a subset of credit risk)
- Market
- Operational

- Liquidity

- Other
  - Legal
  - Reputational

The Three Risks: Credit, Market and Operational

Credit Risk Management

Credit risk arises from the potential that a borrower or counterparty will fail to perform on an obligation. For most banks, loans are the largest and most obvious source of credit risk. However, there are other sources of credit risk both on and off the balance sheet. Off-balance sheet items include letters of credit unfunded loan commitments, and lines of credit. Other products, activities, and services that expose a bank to credit risk are credit derivatives, foreign exchange, and cash management services.

https://www.federalreserve.gov/supervisionreg/topics/credit_risk.htm

The Three Risks: Credit, Market and Operational

Market Risk Management

Market risk encompasses the risk of financial loss resulting from movements in market prices. Market risk is rated based upon, but not limited to, an assessment of the following evaluation factors: The sensitivity of the financial institution's earnings or the economic value of its capital to adverse changes in interest rates, foreign exchanges rates, commodity prices, or equity prices. The ability of management to identify, measure, monitor, and control exposure to market risk given the institution's size, complexity, and risk profile. The nature and complexity of interest rate risk exposure arising from nontrading positions.

https://www.federalreserve.gov/supervisionreg/topics/market_risk_mgmt.htm

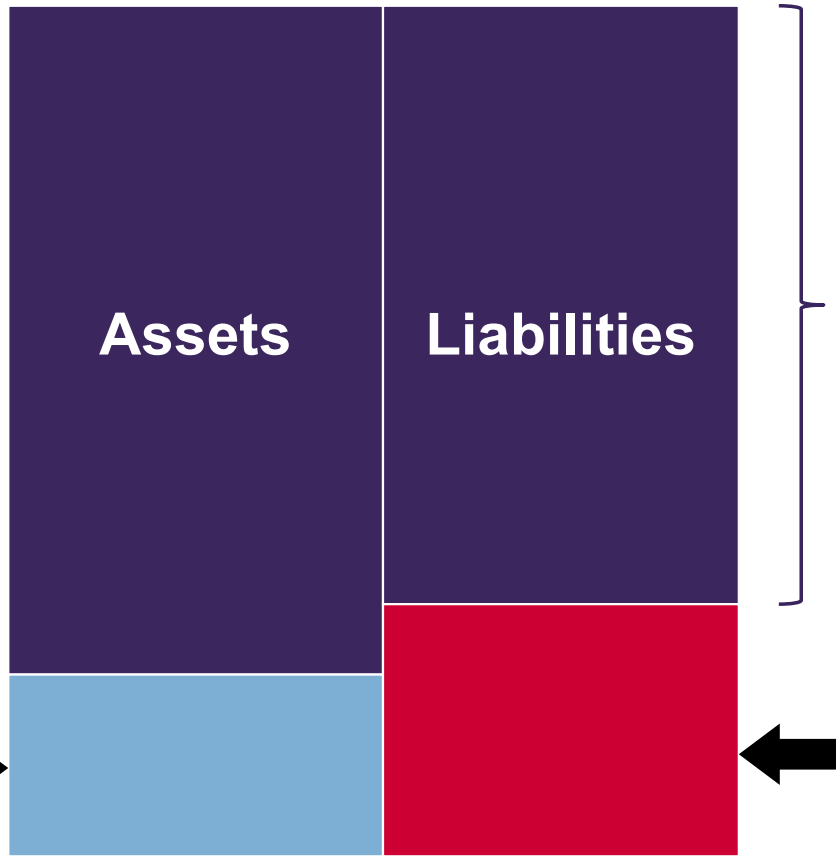
The Three Risks: Credit, Market and Operational

Operational Risk Management

Operational risk arises from the potential that inadequate information systems, operational problems, breaches in internal controls, fraud, or unforeseen catastrophes will result in unexpected losses (SR 95-51). Although operational risk does not easily lend itself to quantitative measurement, it can result in substantial costs through error, fraud, or other performance problems. The growing dependence of banking organizations on information technology emphasizes one aspect of the need to identify and control this risk.

https://www.federalreserve.gov/supervisionreg/topics/op_risk_mgmt.htm

Importance of Capital



Other liabilities (e.g., long-term debt)

Potential asset shrinkage (e.g., due to credit risk losses)

Adequate 'going concern' capital to support 'worst case' or 'unexpected' losses (e.g., common stock)

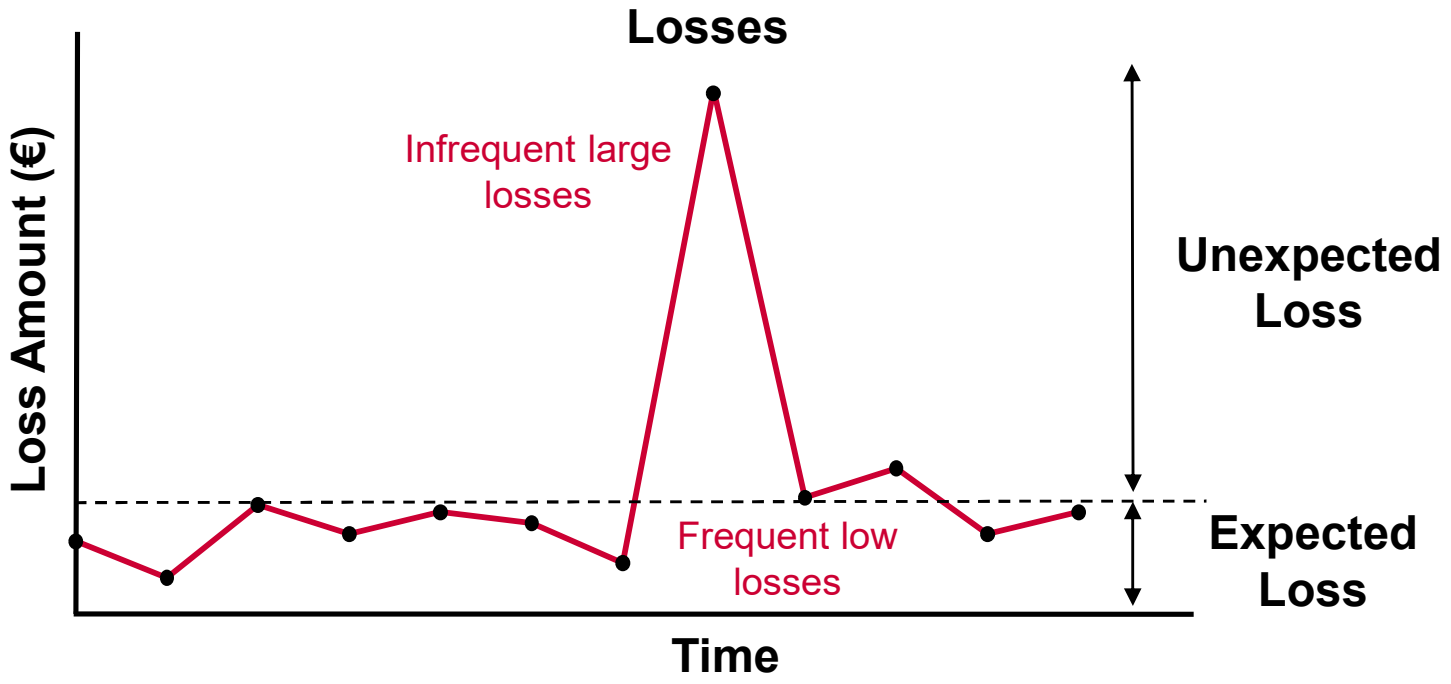
Definition of Economic Capital

"The amount of capital a bank would voluntarily set aside to support its business independent of any regulatory requirement"

Capital required:

- To support the business
- To absorb unexpected losses
- At specified probability of default
- Or required rating level, e.g. AA
  - Confidence level associated with AA rating is 99.95%
  - Requires capital sufficient to cover all but 5 out of 10,000 risk scenarios over a 1 year horizon

Economic Capital: Concept of Unexpected Loss



Expected Loss (EL)

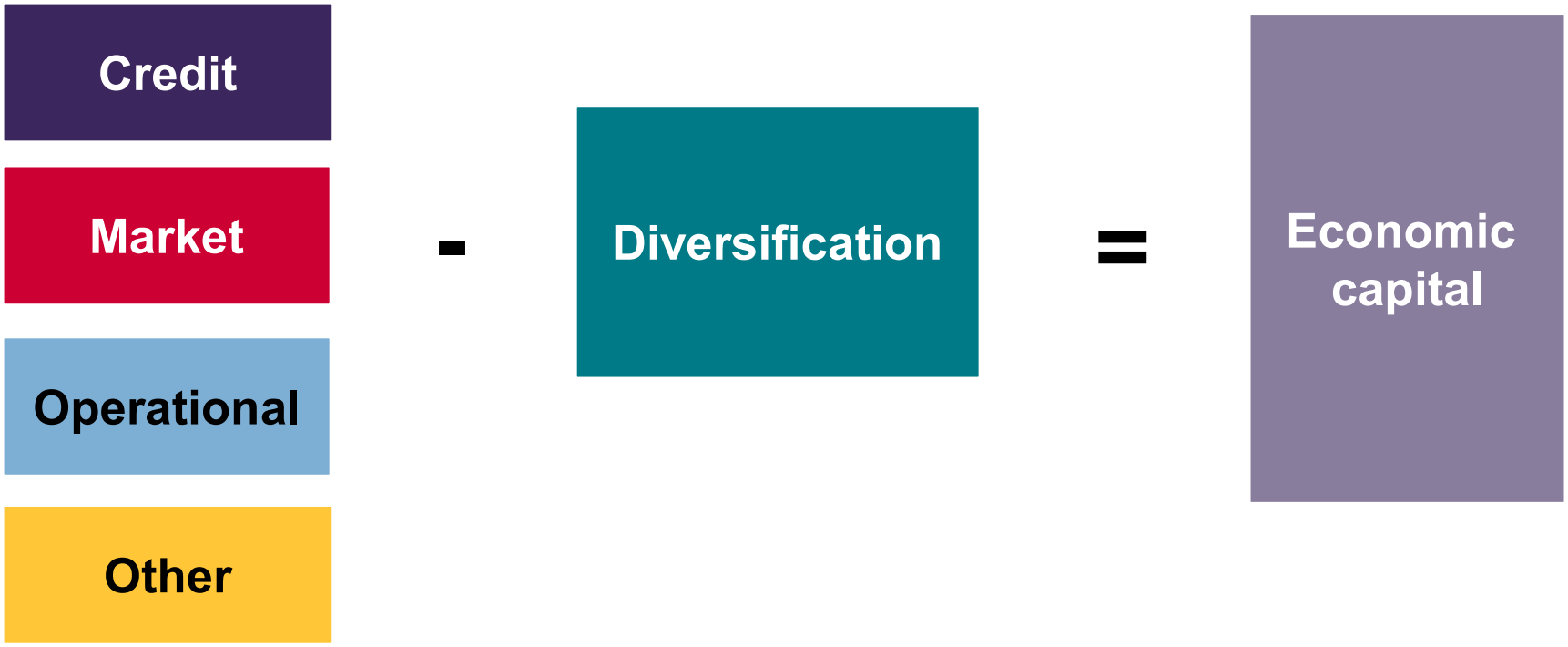
- Most years, losses are low
- Acceptable cost of doing business
- Absorbed by reserves / provisions

Unexpected Loss (UL)

- Large losses punctuate business cycle
- Absorbed by capital

Economic Capital

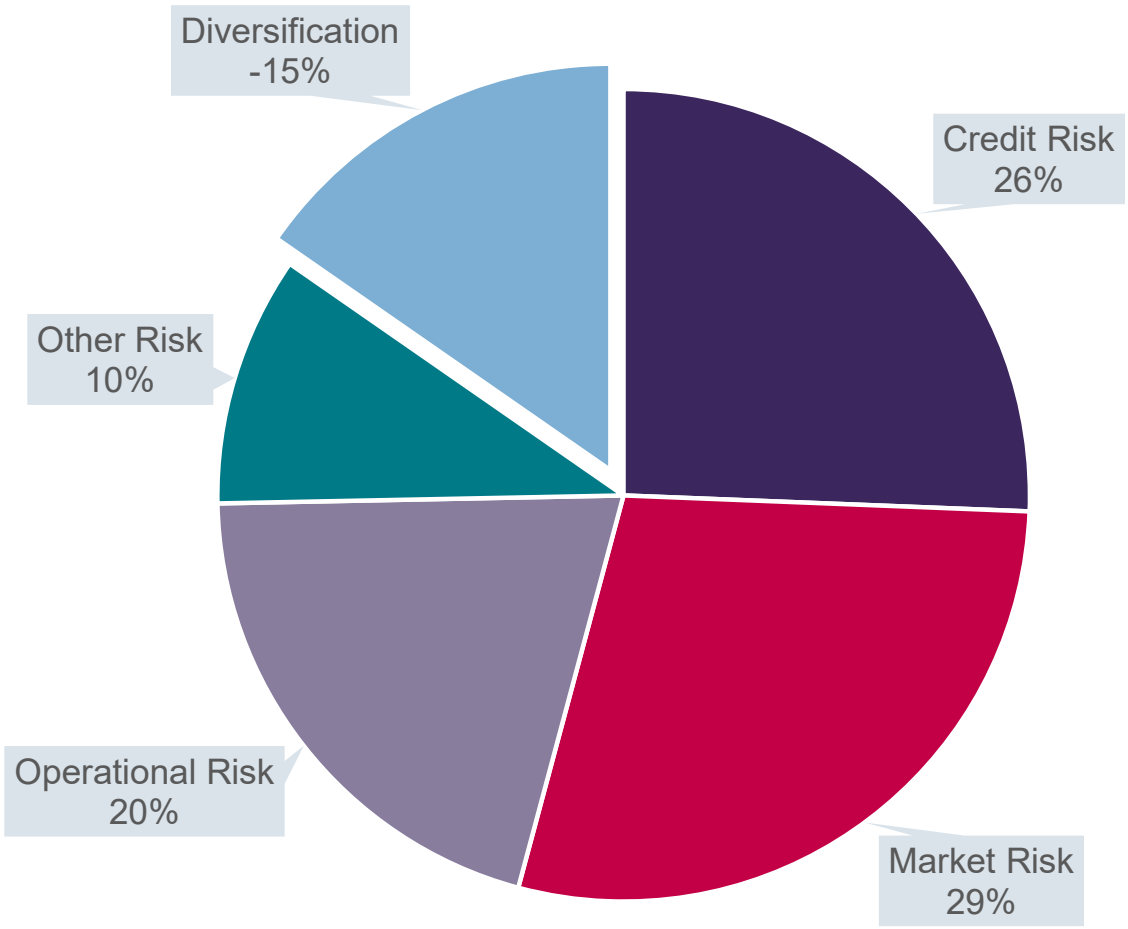
The capital required to absorb unexpected (very severe) losses



Used for internal capital allocation and risk-adjusted profitability measurement.

Economic Capital: Deutsche Bank Allocation by Risk Type

2016:
Total EUR35.4 billion (EUR43.3 billion gross before diversification)



Source: Deutsche Bank 2016 Annual Report, page 92

The BIS and Banking Regulation

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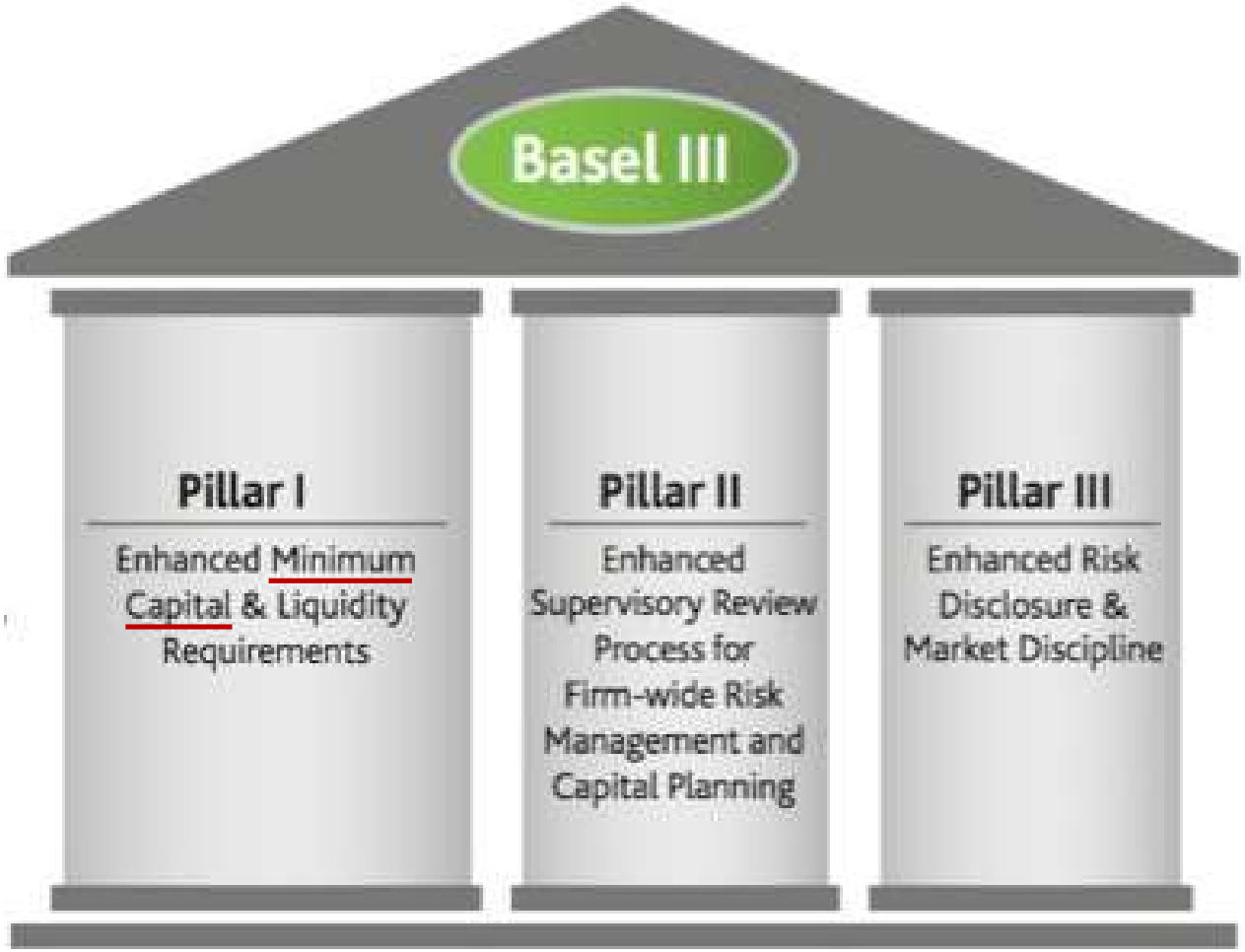
The Basel Committee for Banking Supervision (BCBS)

The Basel Committee – initially named the Committee of Banking Regulations and Supervisory Practices – was established by the central bank Governors of the Group of Ten countries at the end of **1974** in the aftermath of serious disturbances in international currency and banking markets (notably the failure of Bankhaus Herstatt in West Germany).

The Committee, headquartered at the Bank for International Settlements (**BIS**) in Basel, was established to enhance financial stability by improving the quality of banking supervision worldwide, and to serve as a forum for regular cooperation between its member countries on banking supervisory matters.

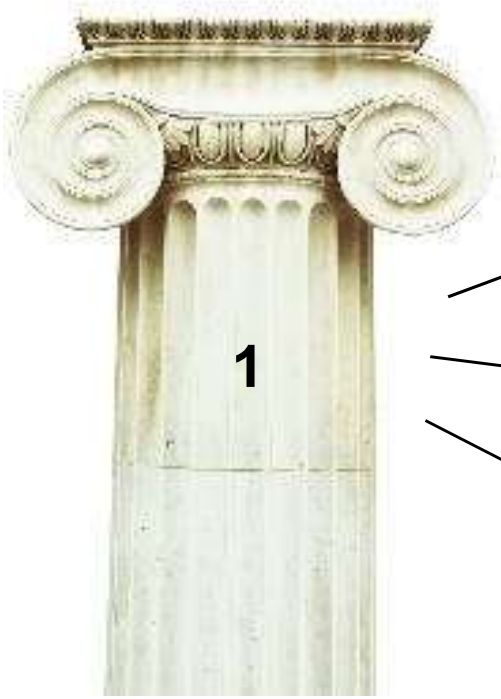
Since its inception, the Basel Committee has expanded its membership from the G10 to 45 institutions from 28 jurisdictions. The Committee has established a series of international standards for bank regulation, most notably its landmark publications of the accords on capital adequacy which are commonly known as Basel I, Basel II and, most recently, Basel III.

Basel III: The Three Pillars



- Regulatory capital = the minimum amount of capital according to the relevant regulatory rules (more important that economic capital!)

The First Pillar: Minimum Capital Requirement



8%

Credit risk:

Basel 1:	Standardised
Basel 2:	Different more risk sensitive approaches
Basel 3:	Enhanced counterparty risk requirements

Market risk:

Basel 2	VAR models
Basel 2.5	Additional requirements
Basel 4	Fundamental review of the trading book

Operational risk:
New in Basel 2, unchanged Basel 3

Types of Capital

- Tier 1
  - Common equity tier 1 (CET1)
    - Examples: common equity and some other components (e.g. retained earnings)
  - Additional tier 1
    - Examples: contingent convertibles and hybrid securities which are perpetual and are converted into equity when CET1 falls below a certain level
- Tier 2
  - Examples: preference shares, subordinated term debt

Going concern capital

Gone concern capital

Capital Methodologies

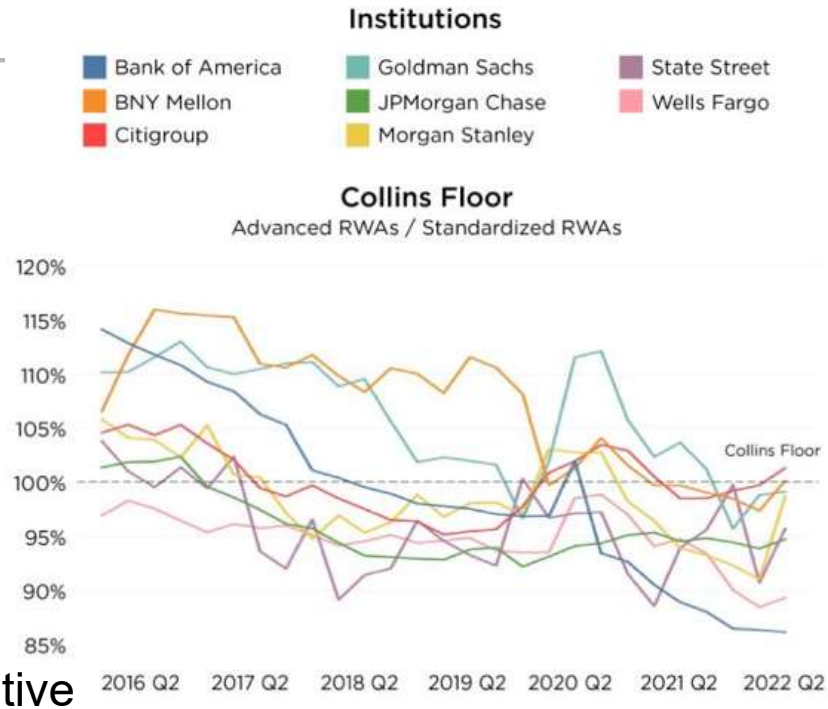
Huge amount of complexity due to:

- Different risk types requiring different approaches
  - VAR for market risk, ratings-based for credit risk
  - Market risk generally quite quantitative, operational risk much more basic
- Different methodologies to suit different banks
  - Generally basic, standardised and advanced (don't always get three choices)
- Regulatory change
  - Improvements and changes to methodologies (e.g. FRTB)
  - Not as simple as Basel 1, Basel 2, Basel 3, ……..
- New initiatives
  - Leverage ratio, CVA capital charge

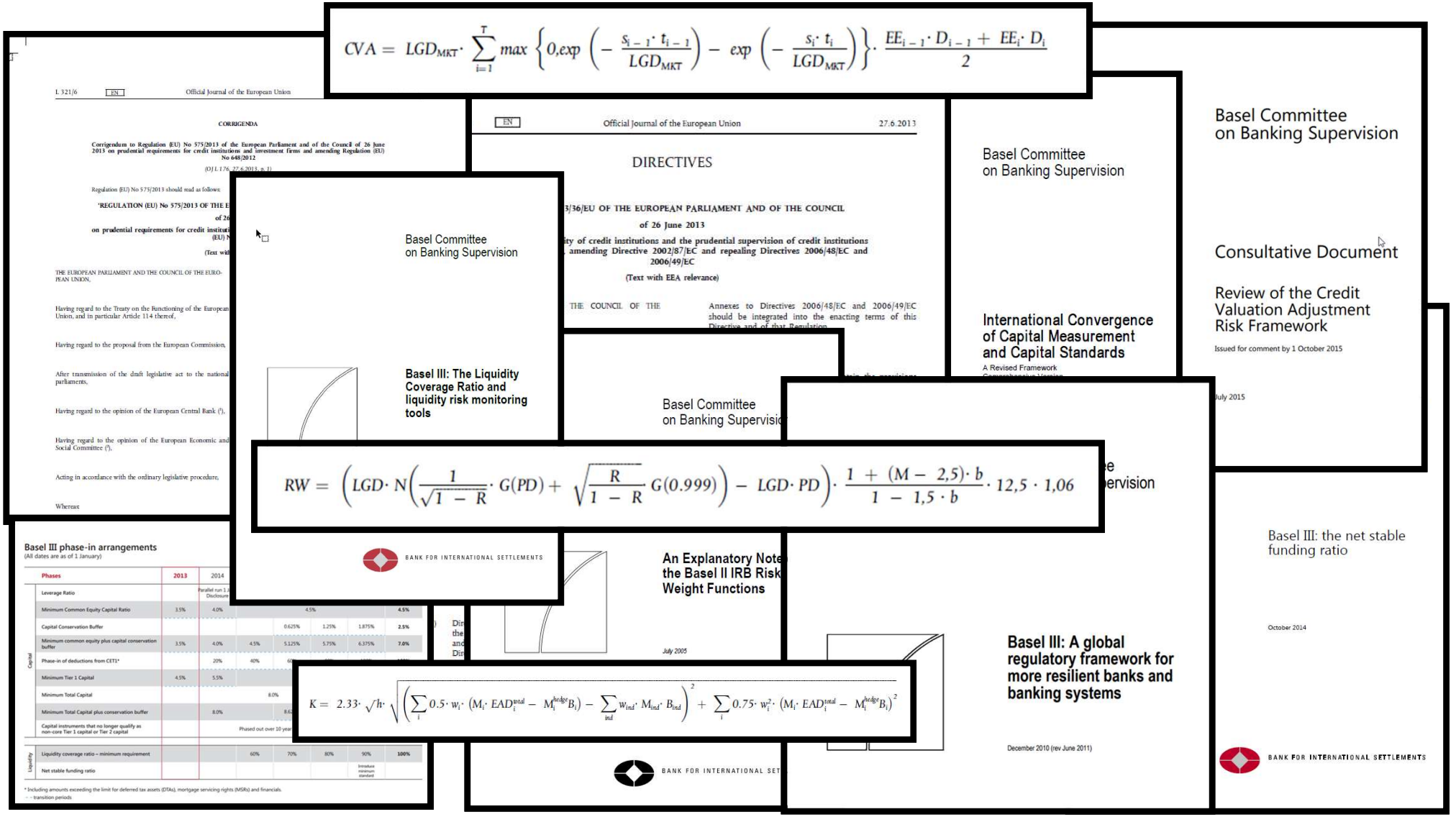
Capital Methodologies

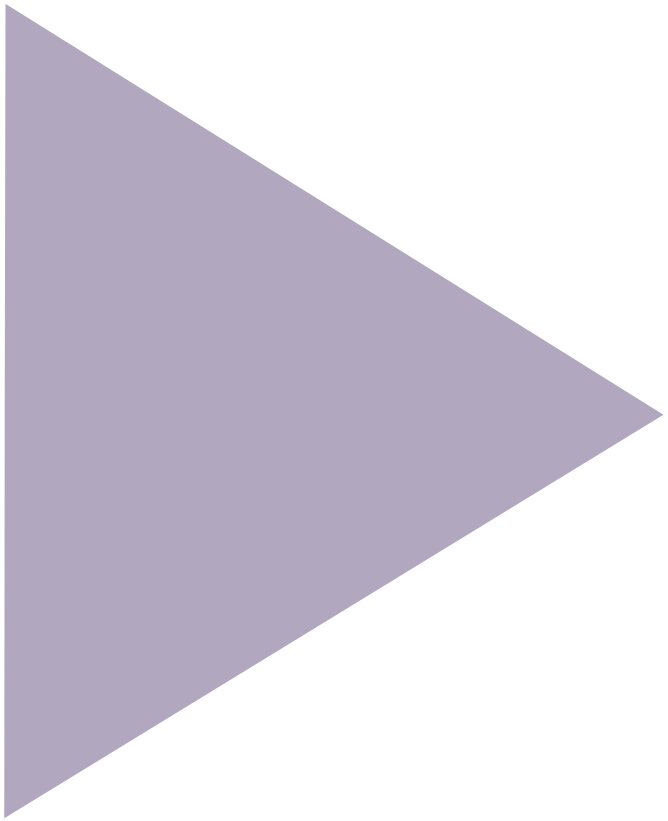
Huge amount of complexity due to:

- Internal model or not?
  - Internal models can be sophisticated and risk sensitive but are subjective and benchmarking exercises show wide variation
  - Simple approaches are objective but not risk sensitive
- Data
  - Depends on risk type
  - Plentiful for market risk, supporting more model-based approaches
  - Sparse for credit and operational risk leading to simpler approaches
- Quant angle
  - Lots of jobs requiring regulatory expertise
  - Can be quite mathematical and model intensive in the standardised and advanced methodologies but rarely logical!



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


$$CVA = LGD_{MKT} \cdot \sum_{i=1}^{T} max\left\{0, exp\left(-\frac{s_{i-1} \cdot t_{i-1}}{LGD_{MKT}}\right) - exp\left(-\frac{s_i \cdot t_i}{LGD_{MKT}}\right)\right\} \cdot \frac{EE_{i-1} \cdot D_{i-1} + EE_i \cdot D_i}{2}$$
L 321/6 EN Official Journal of the European Union
CORRIGENDA
Corrigendum to Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012
(OJ L 176, 27.6.2013, p. 1)
Regulation (EU) No 575/2013 should read as follows:
'REGULATION (EU) No 575/2013 OF THE E
of 26
on prudential requirements for credit institut
(EU) N
(Text wit
THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EURO-PEAN UNION,
Having regard to the Treaty on the Functioning of the European Union, and in particular Article 114 thereof,
Having regard to the proposal from the European Commission,
After transmission of the draft legislative act to the national parliaments,
Having regard to the opinion of the European Central Bank (1),
Having regard to the opinion of the European Economic and Social Committee (2),
Acting in accordance with the ordinary legislative procedure,
Whereas
EN Official Journal of the European Union 27.6.2013
DIRECTIVES
3/36/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 26 June 2013
ity of credit institutions and the prudential supervision of credit institutions amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC
(Text with EEA relevance)
THE COUNCIL OF THE
Annexes to Directives 2006/48/EC and 2006/49/EC should be integrated into the enacting terms of this Directive and of that Regulation
Basel Committee
on Banking Supervision
Basel Committee
on Banking Supervision
Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools
Basel Committee
on Banking Supervisio
International Convergence of Capital Measurement and Capital Standards
A Revised Framework
Basel Committee
on Banking Supervision
Consultative Document
Review of the Credit Valuation Adjustment Risk Framework
Issued for comment by 1 October 2015
July 2015
$$RW = \left(LGD \cdot N\left(\frac{1}{\sqrt{1-R}} \cdot G(PD) + \sqrt{\frac{R}{1-R}} G(0.999)\right) - LGD \cdot PD\right) \cdot \frac{1 + (M - 2{,}5) \cdot b}{1 - 1{,}5 \cdot b} \cdot 12{,}5 \cdot 1{,}06$$
BANK FOR INTERNATIONAL SETTLEMENTS
An Explanatory Note the Basel II IRB Risk Weight Functions
July 2005
Basel III phase-in arrangements
(All dates are as of 1 January)
Phases
2013
2014
Leverage Ratio
Minimum Common Equity Capital Ratio
Capital Conservation Buffer
Minimum common equity plus capital conservation buffer
Phase-in of deductions from CET1*
Minimum Tier 1 Capital
Minimum Total Capital
Minimum Total Capital plus conservation buffer
Capital instruments that no longer qualify as non-core Tier 1 capital or Tier 2 capital
Liquidity coverage ratio – minimum requirement
Net stable funding ratio
* Including amounts exceeding the limit for deferred tax assets (DTAs), mortgage servicing rights (MSRs) and financials.
– – transition periods
$$K = 2.33 \cdot \sqrt{h} \cdot \sqrt{\left(\sum_i 0.5 \cdot w_i \cdot \left(M_i \cdot EAD_i^{total} - M_i^{hedge} B_i\right) - \sum_{ind} w_{ind} \cdot M_{ind} \cdot B_{ind}\right)^2 + \sum_i 0.75 \cdot w_i^2 \cdot \left(M_i \cdot EAD_i^{total} - M_i^{hedge} B_i\right)^2}$$
BANK FOR INTERNATIONAL SET
Basel III: A global regulatory framework for more resilient banks and banking systems
December 2010 (rev June 2011)
Basel III: the net stable funding ratio
October 2014
BANK FOR INTERNATIONAL SETTLEMENTS



Minimum Capital Requirements

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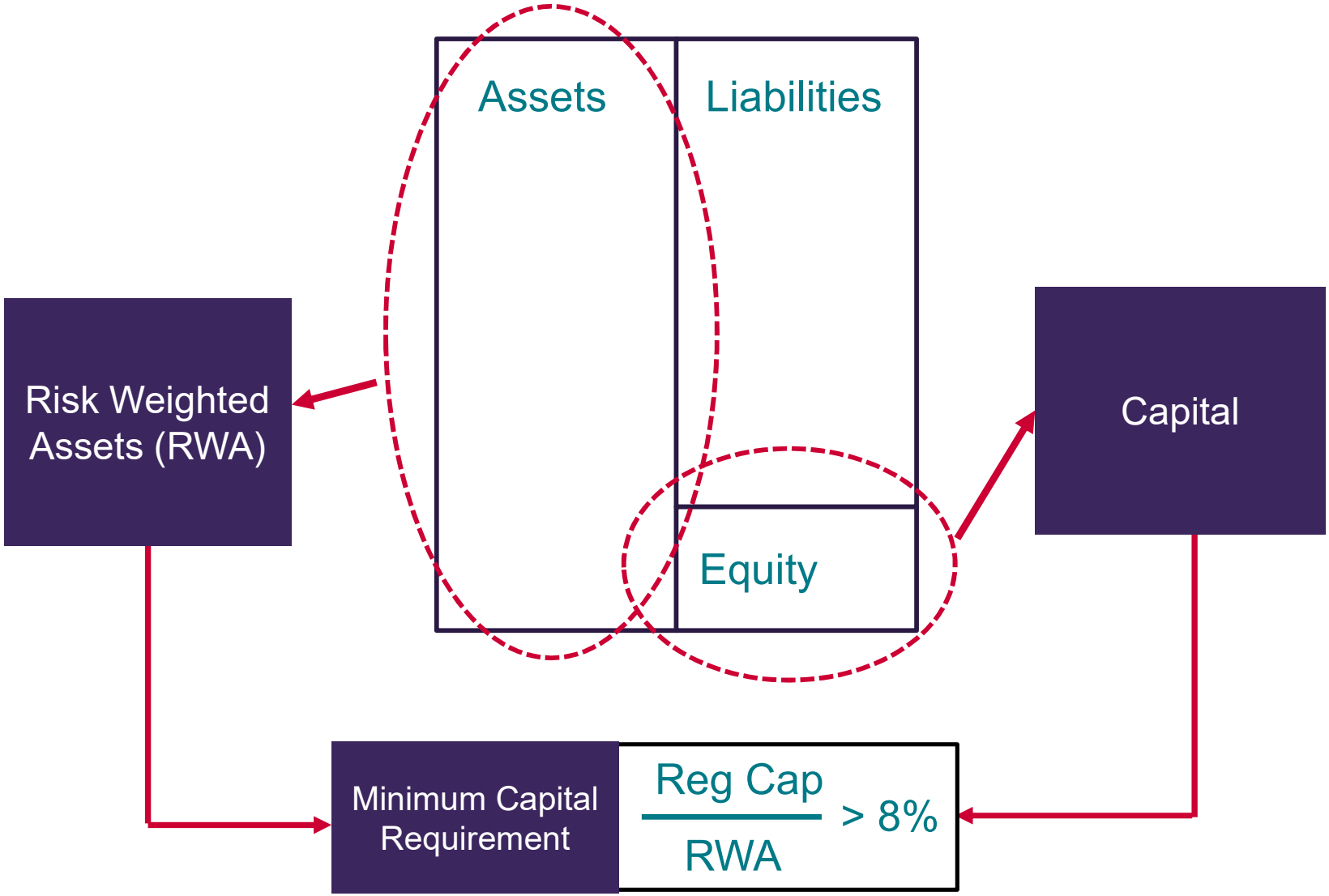
JP Morgan Assets

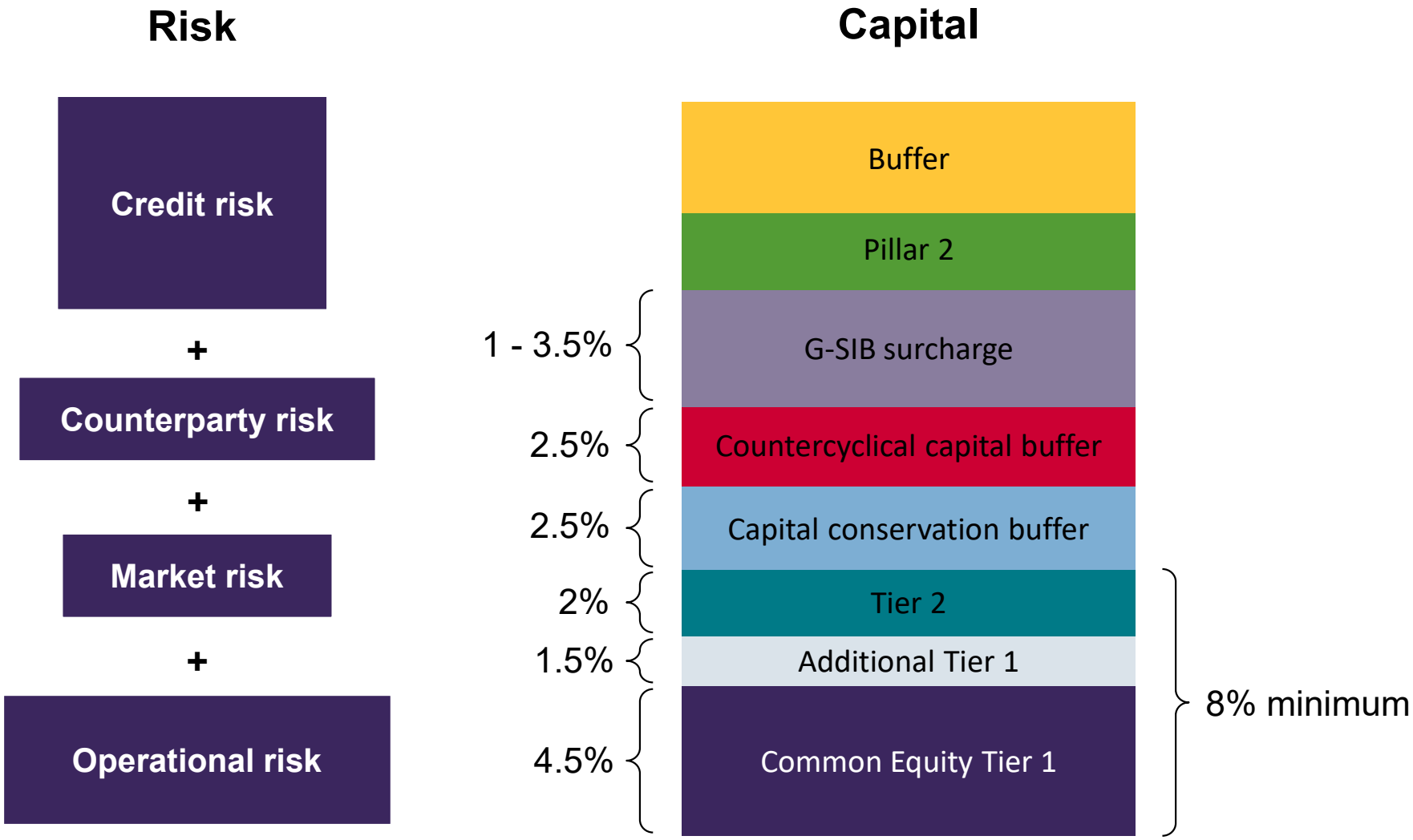
December 31, (in millions, except share data)	2019	2018
Assets		
Cash and due from banks	$ 21,704	$ 22,324
Deposits with banks	241,927	256,469
Federal funds sold and securities purchased under resale agreements (included **$14,561** and $13,235 at fair value)	249,157	321,588
Securities borrowed (included **$6,237** and $5,105 at fair value)	139,758	111,995
Trading assets (included assets pledged of **$111,522** and $89,073)	411,103	413,714
Investment securities (included **$350,699** and $230,394 at fair value and assets pledged of **$10,325** and $11,432)	398,239	261,828
Loans (included **$7,104** and $3,151 at fair value)	959,769	984,554
Allowance for loan losses	(13,123)	(13,445)
Loans, net of allowance for loan losses	946,646	971,109
Accrued interest and accounts receivable	72,861	73,200
Premises and equipment	25,813	14,934
Goodwill, MSRs and other intangible assets	53,341	54,349
Other assets (included **$9,111** and $9,630 at fair value and assets pledged of **$3,349** and $3,457)	126,830	121,022
Total assets[(a)]	$ 2,687,379	$ 2,622,532

What type of and blend of liabilities fund these assets?
How much is shareholder equity?

The Basel Solution for Capital Adequacy



Basel III – New Minimum Ratios (Fully Loaded)



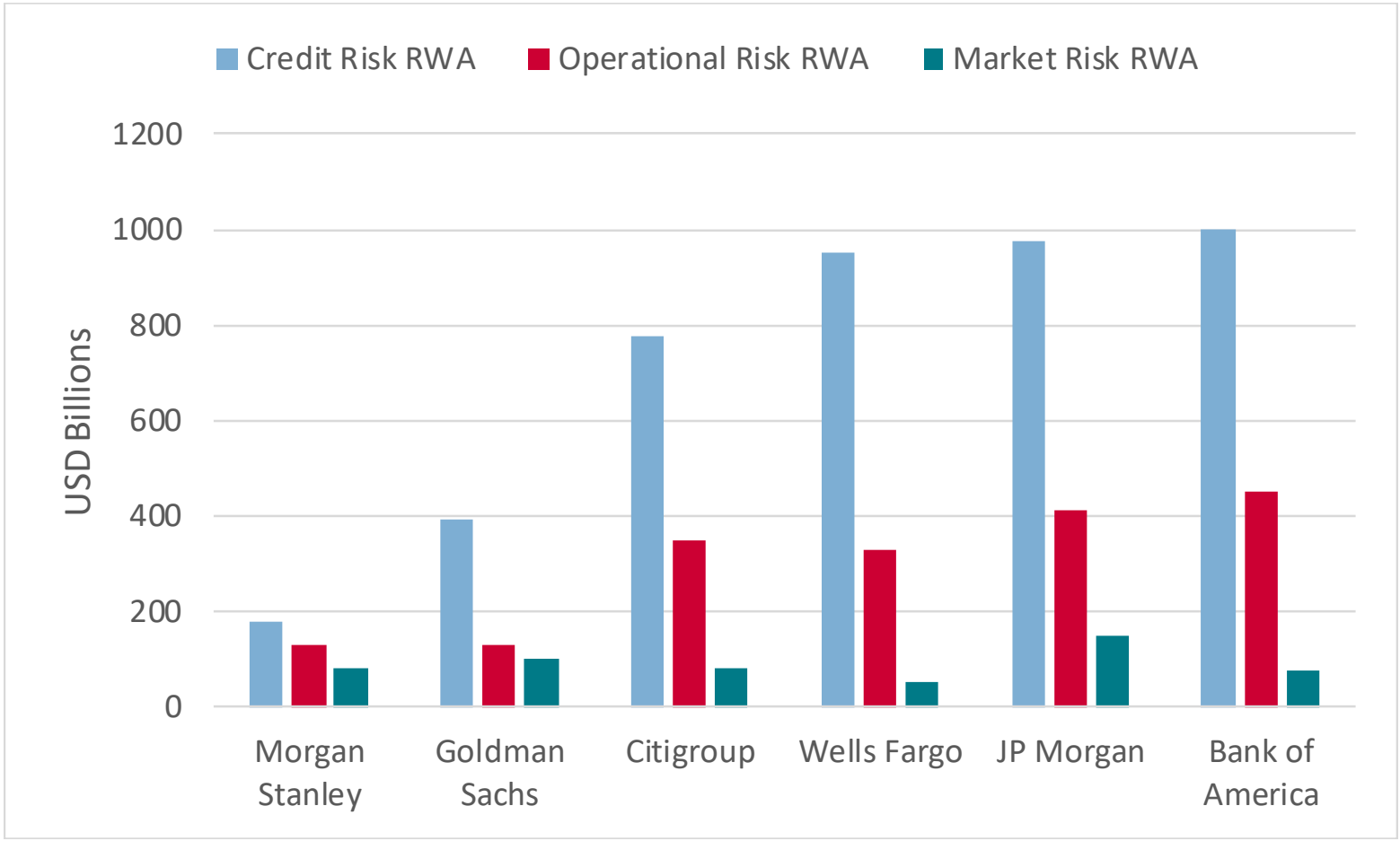
JP Morgan Liabilities

Selected Consolidated balance sheets data

December 31, (in millions)	2019	2018	Change
Liabilities			
Deposits	$ 1,562,431	$ 1,470,666	6
Federal funds purchased and securities loaned or sold under repurchase agreements	183,675	182,320	1
Short-term borrowings	40,920	69,276	(41)
Trading liabilities	119,277	144,773	(18)
Accounts payable and other liabilities	210,407	196,710	7
Beneficial interests issued by consolidated variable interest entities ("VIEs")	17,841	20,241	(12)
Long-term debt	291,498	282,031	3
Total liabilities	2,426,049	2,366,017	3
Stockholders' equity	261,330	256,515	2
Total liabilities and stockholders' equity	$ 2,687,379	$ 2,622,532	2%

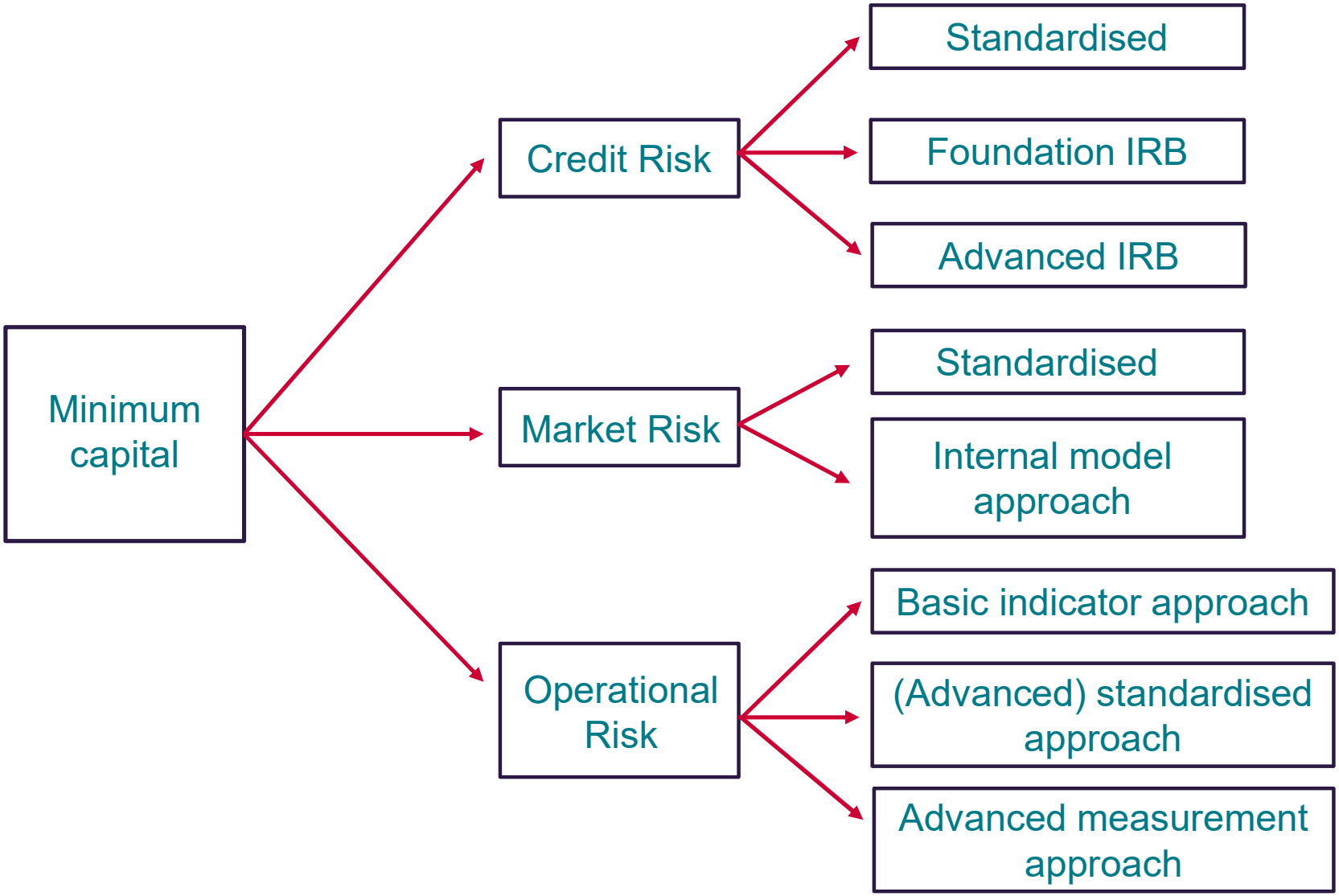
Source: RBS Pillar 3 Report 2017

How Much of Each Risk Type does a Bank Take?

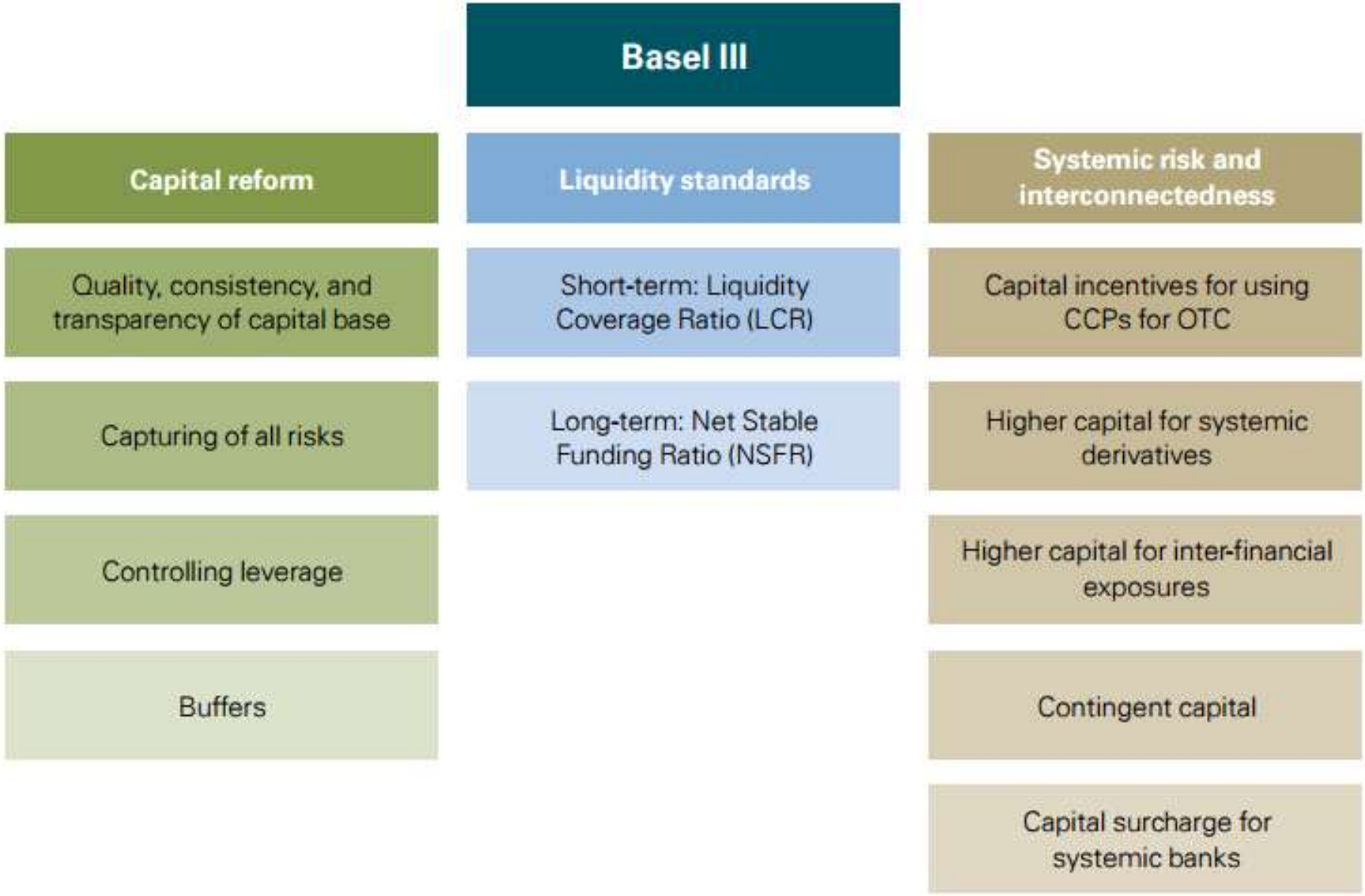


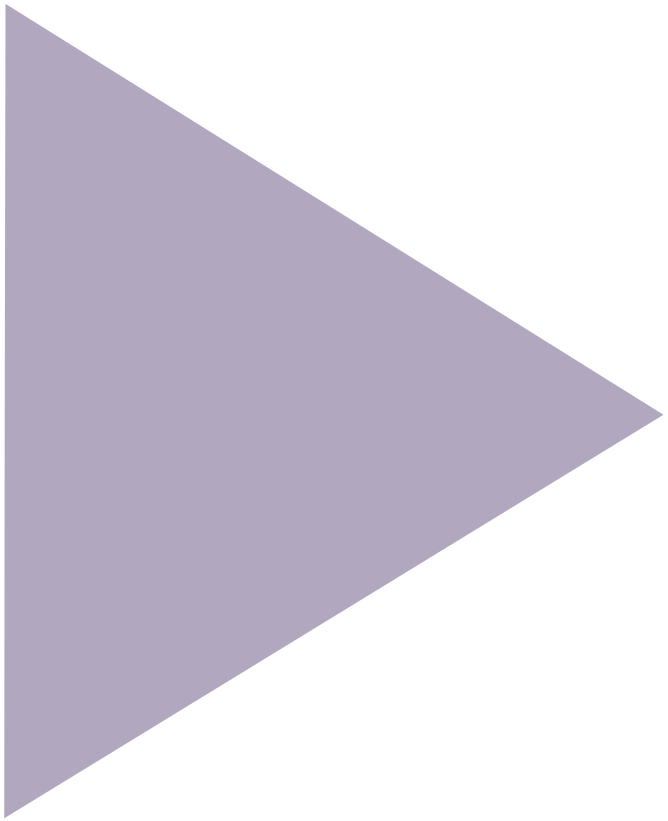
Source: Pillar 3 Statements

Methodology Menu



Basel III Changes (2008 onwards)





Liquidity Risk

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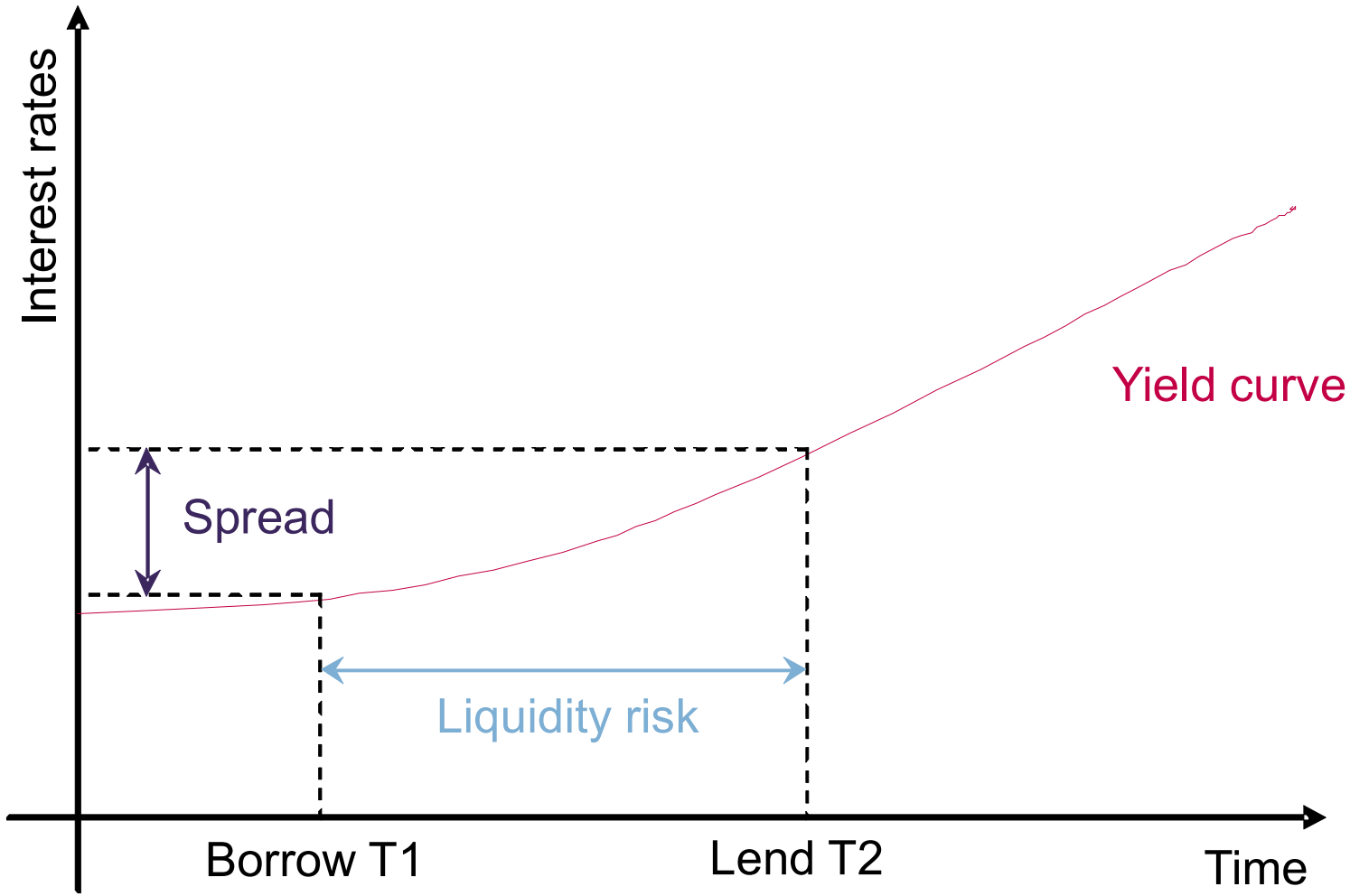
Liquidity Risk: Inherent in Banking

Maturity transformation



Liquidity Coverage Ratio

$$\frac{\text{Stock of high quality liquid assets}}{\text{Net cash outflows over a 30-day time period}} \quad >/= 100\%$$

- Short-term liquidity horizon (30 days)
- Sufficient liquid assets to cover stress scenario
  - Run off of retail deposits
  - Loss of wholesale funding
  - Additional collateralisation
  - Draws on contingent obligations
- Based on experience of 2007-2009
- Phased implementation from 2015

LCR Example

Compliance with internal and regulatory stress tests

As at 31 December 2015	Barclays' LRA (one month Barclays specific requirement)[a] £bn	CRD IV Interim LCR[b] £bn
Total eligible liquidity pool	145	147
Asset inflows	1	18
Stress outflows		
Retail and commercial deposit outflows	(50)	(72)
Wholesale funding	(15)	(12)
Net secured funding	(12)	(1)
Derivatives	(8)	(6)
Contractual credit rating downgrade exposure	(6)	(5)
Drawdowns of loan commitments	(7)	(32)
Intraday	(13)	–
Total stress net cash flows	(110)	(110)
Surplus	35	37
Liquidity pool as a percentage of anticipated net cash flows	131%	133%
As at 31 December 2014	124%	124%

Net Stable Funding Ratio

$$\frac{\text{Available amount of stable funding (ASF)}}{\text{Required amount of stable funding (RSF)}} > 100\%$$

- Liquidity out to one-year horizon
- Funding required to finance assets:
  - Which cannot be sold
  - Are utilised as collateral
  - Netted vs. liabilities
- Assumes post-stress scenarios
  - Retail deposit outflows
  - Inability to access wholesale refinancing, etc.
  - Illiquidity of assets
- Effective from 2018

NSFR Example

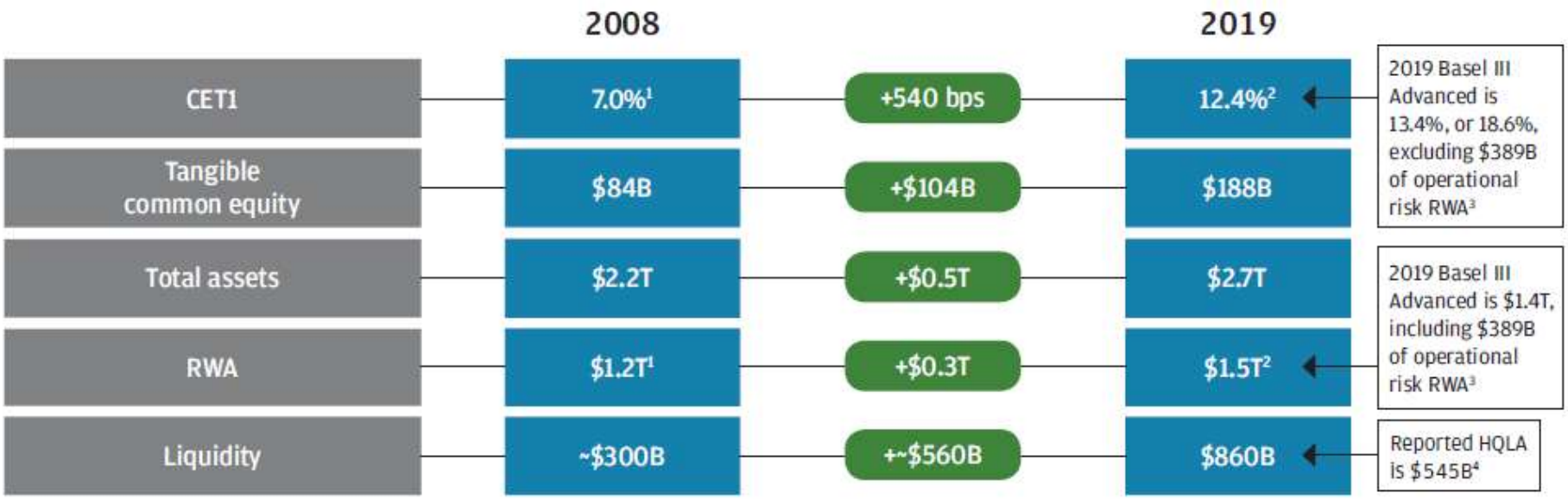
	2014	
		ASF/RSF (1)
	£bn	£bn
Equity		
- regulatory capital	49	49
- other equity	11	—
Wholesale funding > 1 year	63	63
Wholesale funding < 1 year	53	—
Derivative liabilities	350	—
Repurchase agreements	65	—
Deposits		
- retail and SME - more stable	206	196
- retail and SME - less stable	62	56
- other	147	74
Other (2)	45	—
Total liabilities and equity	1,051	438

Cash	75	—
Inter-bank lending	25	4
Debt securities > 1 year		
- governments AAA to AA-	46	2
- other eligible bonds	22	3
- other bonds	9	9
Debt securities < 1 year	25	13
Derivative assets		
- assets equal to derivative liabilities	350	—
- excess over derivative liabilities	4	4
Reverse repurchase agreements	65	7
Customer loans and advances > 1 year		
- residential mortgages	138	90
- other	123	105
Customer loans and advances < 1 year	134	67
Other (3)	35	35
Total assets	1,051	339
Derivative liabilities after mtm netting arrangements	55	11
Undrawn commitments	215	11
Total assets and undrawn commitments	1,321	361
Net stable funding ratio		121%

Summary – JP Morgan

Our Fortress Balance Sheet

at December 31,



[1] CET1 reflects the Tier 1 common ratio under the Basel I measure.

[2] Reflects the Basel III Standardized measure, which is the firm's current binding constraint.

[3] Operational risk RWA is a component of RWA under the Basel III Advanced measure.

[4] Represents quarterly average HQLA included in the liquidity coverage ratio. Refer to Liquidity Coverage Ratio on page 94 for additional information.

B = Billions

T = Trillions

bps = basis points

CET1 = Common equity Tier 1 ratio. Refer to Regulatory capital on pages 86-90 for additional information

RWA = Risk-weighted assets

Liquidity = HQLA plus unencumbered marketable securities, which includes excess liquidity at JPMorgan Chase Bank, N.A.

HQLA = High quality liquid assets include cash on deposit at central banks and highly liquid securities (predominantly U.S. Treasuries, U.S. government-sponsored enterprises and U.S. government agency mortgage-backed securities, and sovereign bonds)

LCR = Liquidity coverage ratio

Case Study: The Internal Ratings Based Approach (IRB)

FitchLearning

Credit Ratings: Agency Definitions

Description	Fitch and S&P		Moody's		Short term	Explanation
Highest credit quality	AAA		Aaa		F1	Exceptionally strong capacity for timely payment of financial commitments which is highly unlikely to be adversely affected by foreseeable events.
Very high credit quality	AA	AA+ AA AA-	Aa	Aa1 Aa2 Aa3		Very strong capacity for timely payment of financial commitments which is not significantly vulnerable to foreseeable events.
High credit quality	A	A+ A A-	A	A1 A2 A3	F2	Strong capacity for timely payment of financial commitments which may be more vulnerable to changes in circumstances/ economic conditions.
Good credit quality	BBB	BBB+ BBB BBB-	Baa	Baa1 Baa2 Baa3	F3	Adequate capacity for timely payment of financial commitments but adverse changes in circumstances/ economic conditions are more likely to impair this capacity.
Speculative	BB	BB+ BB BB-	Ba	Ba1 Ba2 Ba3		Possibility of credit risk developing, particularly due to adverse economic change over time. Business/financial alternatives may be available to allow financial commitments to be met.
Highly speculative	B	B+ B B-	B	B1 B2 B3	B	Significant credit risk with a limited margin of safety. Financial commitments currently being met; however, continued payment is contingent upon a sustained, favourable business and economic environment.
High default risk	CCC		Caa		C	Default is a real possibility. Capacity for meeting financial commitments is solely reliant upon sustained, favourable business or economic developments.
Probable default	CC		Ca			Default of some kind appears probable.
Likely default	C		C			Default imminent.

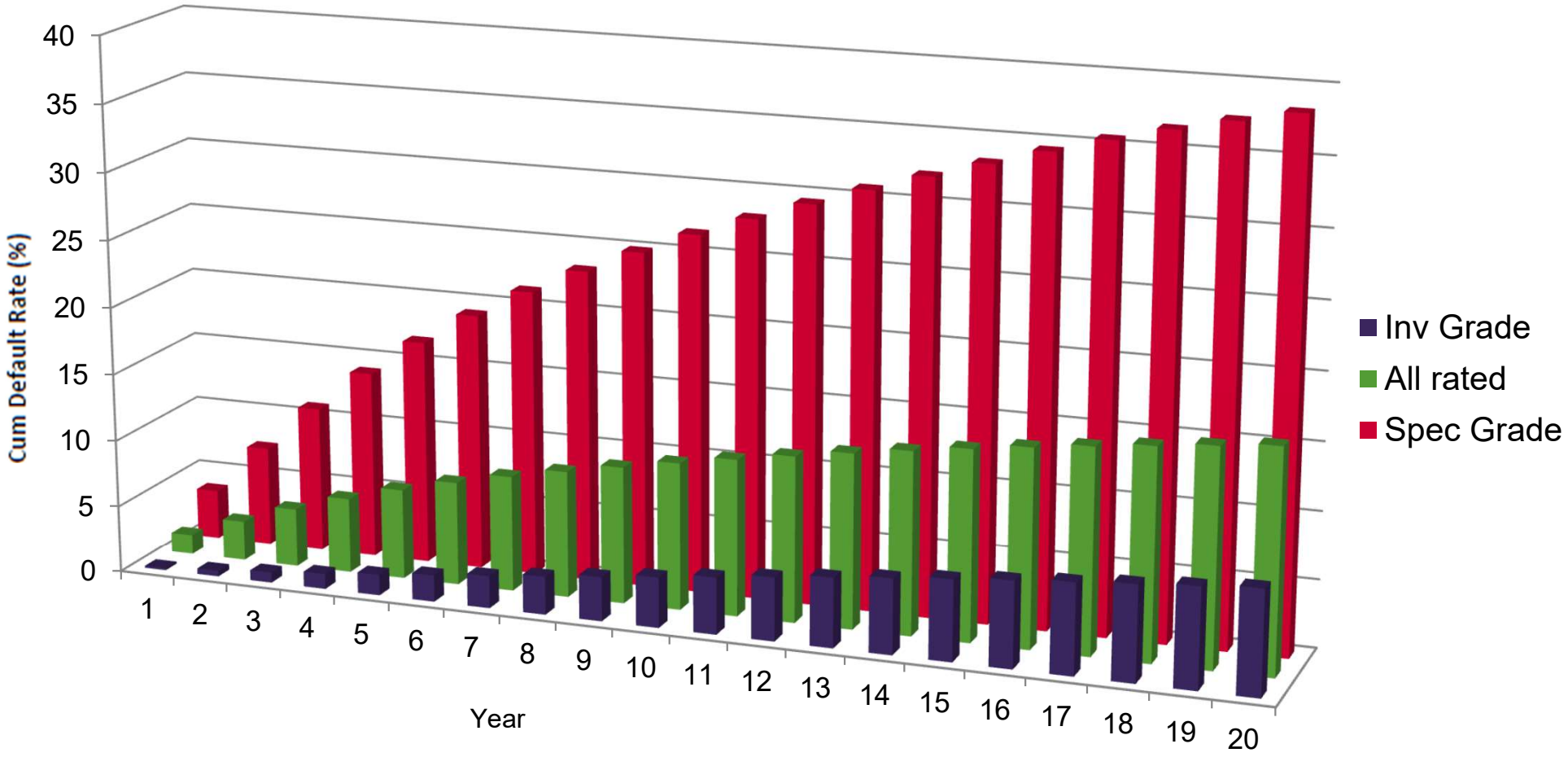
Average One-Year Rating Transition Matrix 1970-2015

Global Corporate Bonds

Rating to:	Aaa	Aa	A	Baa	Ba	B	Caa	Ca-C	D	WR
Aaa	87.48	8.14	0.59	0.06	0.02	0.00	0.00	0.00	0.00	3.71
Aa	0.83	85.15	8.45	0.44	0.06	0.04	0.02	0.00	0.02	4.99
A	0.06	2.57	86.60	5.37	0.51	0.11	0.04	0.01	0.06	4.68
Baa	0.04	0.16	4.30	85.44	3.74	0.69	0.16	0.02	0.18	5.26
Ba	0.01	0.04	0.47	6.17	76.17	7.17	0.68	0.12	0.92	8.25
B	0.01	0.03	0.15	0.45	4.78	73.52	6.49	0.56	3.41	10.60
Caa	0.00	0.01	0.03	0.11	0.42	7.02	66.77	2.81	8.52	14.32
Ca-C	0.00	0.00	0.06	0.00	0.62	2.46	9.47	39.59	24.09	23.71

Source: Moody's Investors Services: Corporate Default and Recovery Rates, 1920-2015 (Moody's, February 2016)

Cumulative Default Rates: Corporates Summary



Source: Moody's Investors Services: Corporate Default and Recovery Rates, 1920 - 2015 (Moody's - February 2016)

Risk Weights

Basel 1

	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to BB-	B+ to B-	Below B-	Unrated
Country	100%						
Bank							
Corporation							

Basel 2

	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to BB-	B+ to B-	Below B-	Unrated
Country	0	20%	50%	100%	100%	150%	100%
Bank	20%	50%	50%	100%	100%	150%	50%
Corporation	20%	50%	100%	100%	150%	150%	100%

Background

- In 1996, the BIS started to allow banks with internal model approval to calculate their own capital requirements with these models
  - Note that the models were portfolio based across multiple asset classes
  - Value-at-risk (a quantile) was used to define the capital requirement (99% confidence)
- Not surprisingly, banks wanted to apply their internal models for credit risk also
  - However, credit risk is more difficult to model and there is a shortage of data
  - On the other hand, the Basel 2 risk weights were basic and not very risk sensitive
  - This produced a compromise solution

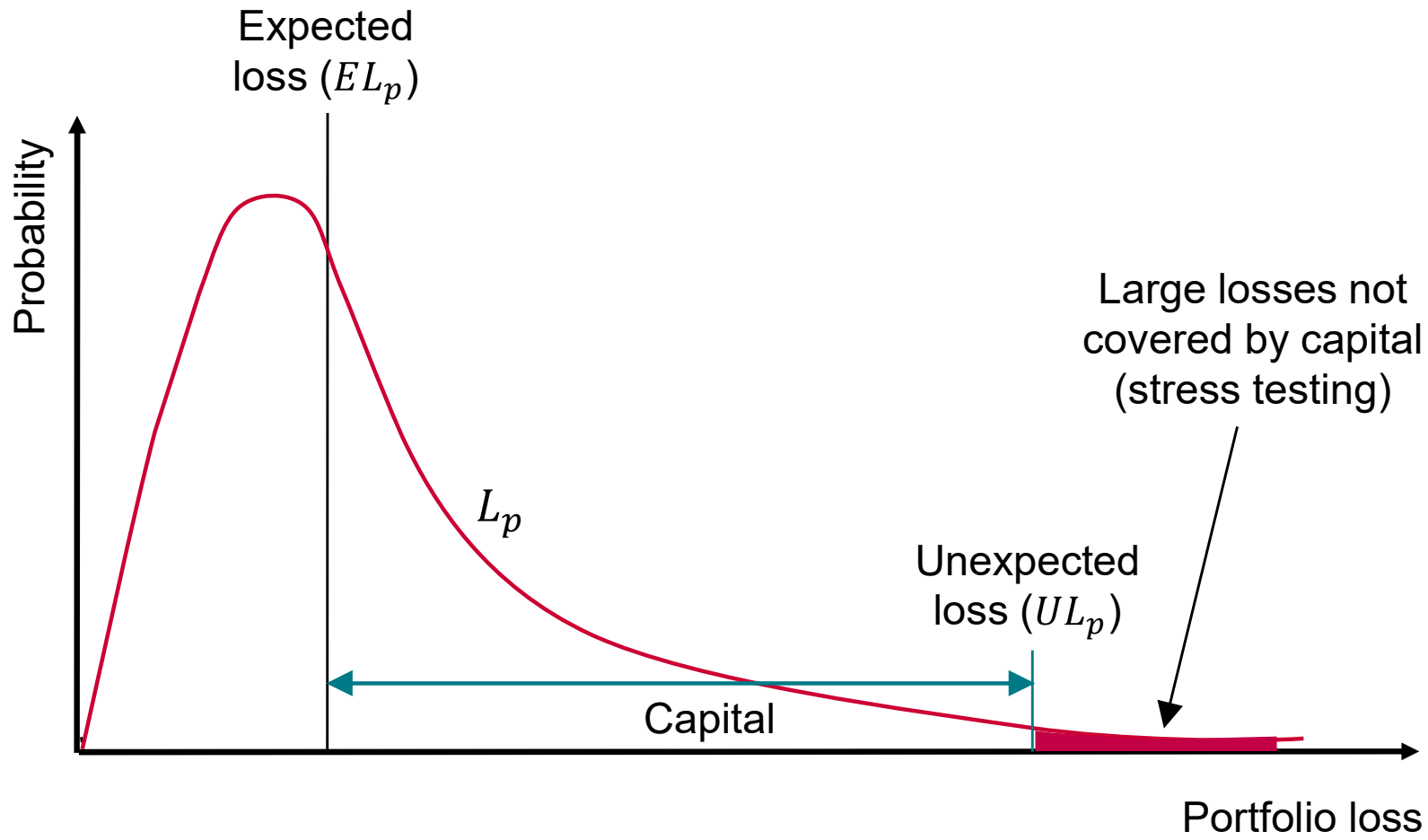
IRB Study: Key Features

- The most advanced approach for credit risk
- Balance between sophistication and simplicity
- Model-based but doesn't use a model
  - Base on an Asymptotic Single Risk Factor (ASRF) model
- Banks can model some parameters
  - PD and LGD where there is reasonable data
  - Not allowed to model (default) correlations where limited data exists

- **Note: more details on modelling in the lecture on Credit Derivatives and Structural Models**

Portfolio Loss Distribution

Portfolio credit loss distribution: Highly skewed and fat-tailed



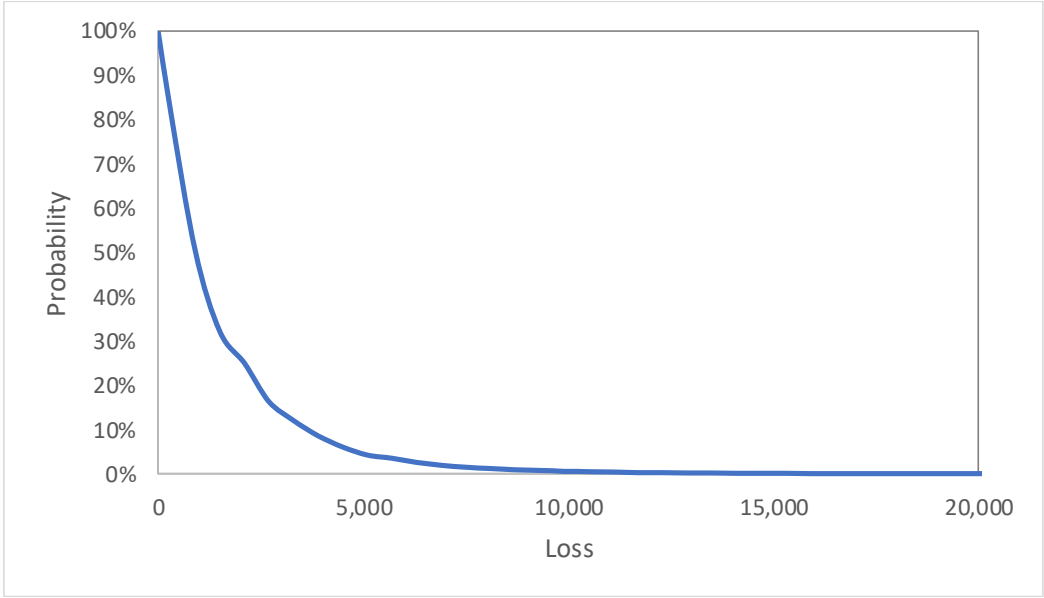
$$Capital = UL_p - EL_p$$

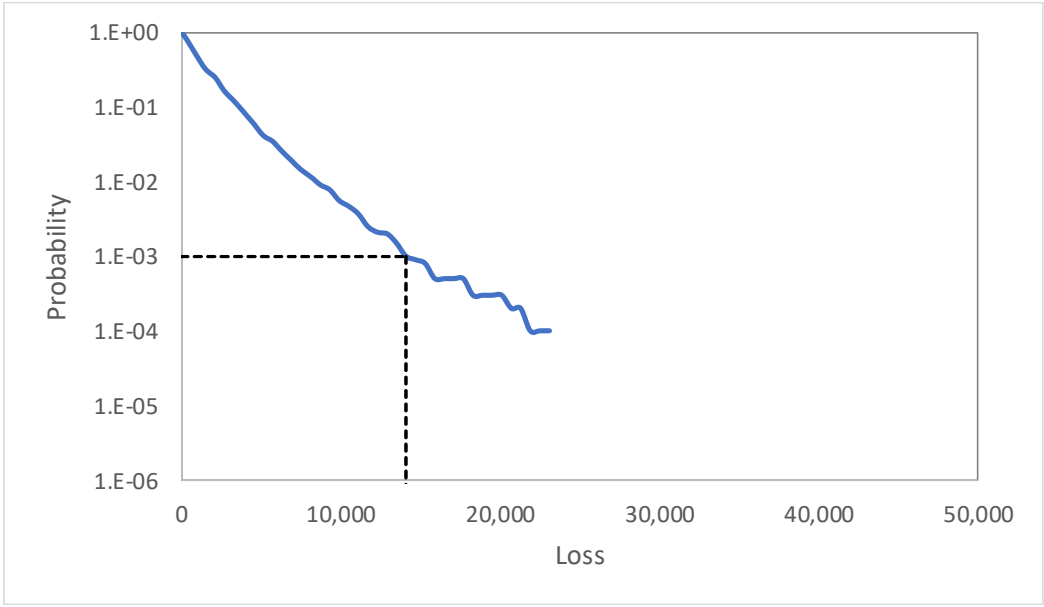
Simple CPM Model

Model portfolio:

- 160 loans in 8 rating bands
- Total portfolio size USD295,000

#loans	PD	LGD	EAD	EL	UL (99.9%)
5	0.05%	70%	4,000	7	?
20	0.10%	60%	2,500	30	?
40	0.20%	60%	2,500	120	?
20	1.00%	50%	2,500	250	?
30	3.00%	35%	1,000	315	?
30	4.00%	35%	1,000	420	?
10	5.00%	35%	1,000	175	?
5	10.00%	35%	1,000	175	?
				1,492	14,178





Expected Losses

$$L_p = \sum_i \underbrace{1_{default_i}}_{\text{Default indicator}} \times \underbrace{LGD_i}_{\text{Loss given default (deterministic)}} \times \underbrace{EAD_i}_{\text{Exposure at default (deterministic)}}$$

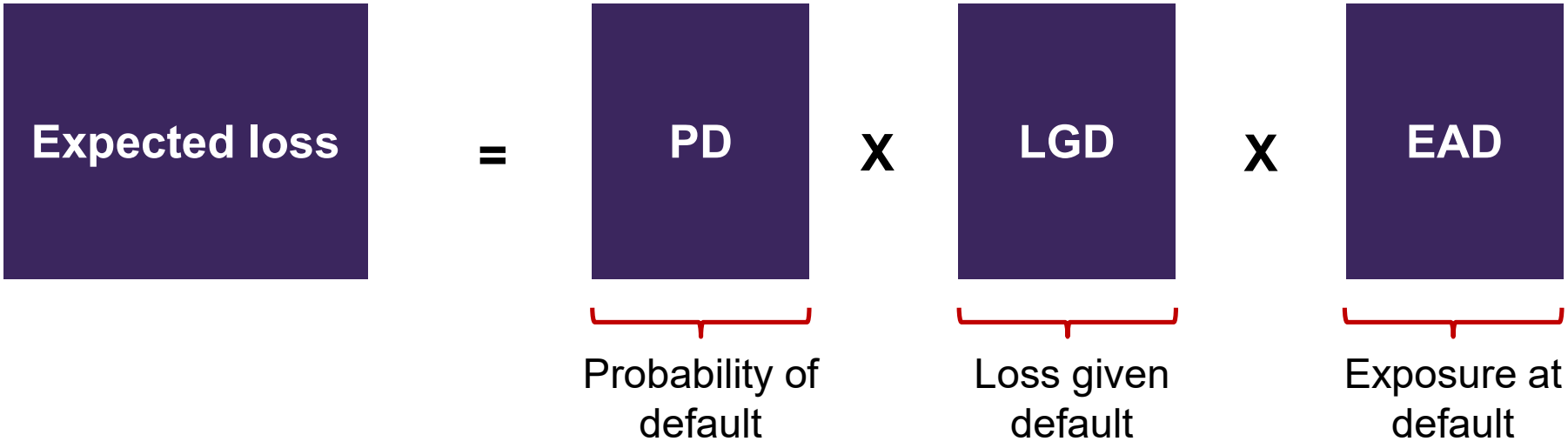
- Assuming independence between EAD, LGD and default

$$EL_p = \sum_i E\left[1_{default_i}\right] \times EAD_i \times LGD_i$$

$$= \sum_i PD_i \times EAD_i \times LGD_i = \sum_i EL_i$$

- Expected loss is additive but unexpected loss is more complicated

Quantifying Credit Risk – Expected Loss

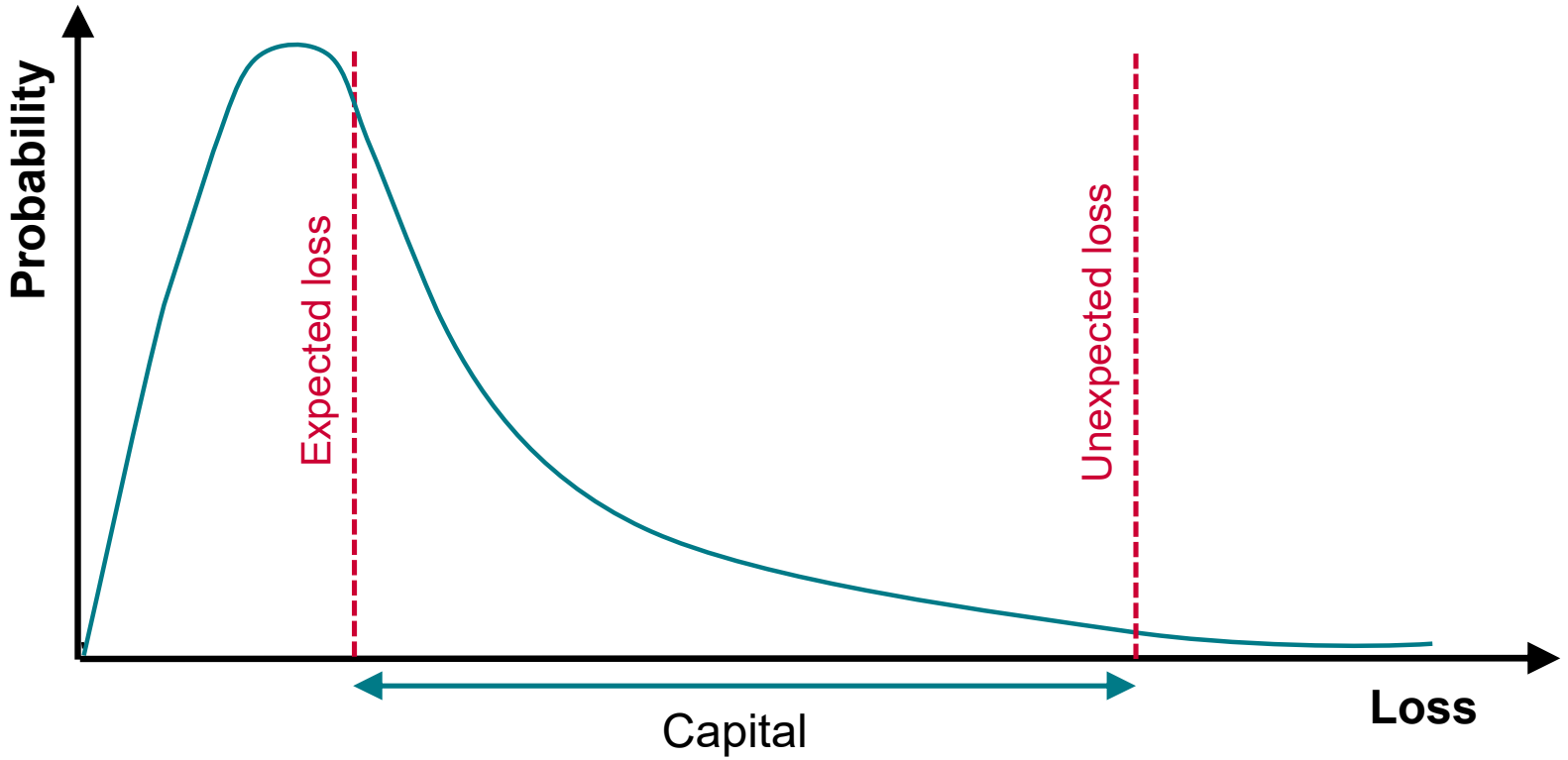


- Note that this also holds for a portfolio, i.e. we just need to sum all of the above components over each obligor
- But for the unexpected loss, correlation is important

Unexpected Loss Approximations

Under certain assumptions, the unexpected loss can be written as a sum over obligors

$$EL_p = \sum_{i=1}^{n} PD_i \times EAD_i \times LGD_i \qquad UL_p = \sum_{i=1}^{n} PD_i^* \times EAD_i \times LGD_i$$



UL Allocation

- Suppose we want to allocate the risk of a portfolio (e.g. unexpected loss) in a way which is
  - Fair
  - Theoretically robust
  - Sums to the total risk
- Euler allocation allows this
  - Involves calculating derivatives with respect to the amount of each exposure
  - Numerical calculation involving sequentially changing each position by a small amount
  - Not very easy to do with Monte Carlo simulation

$$UL^*(i) = \frac{\partial UL(N_1, N_2, \ldots . N_n)}{\partial N_i} \qquad UL_{portfolio} = \sum_{i=1}^{n} UL^*(i)$$

Asymptotic Single Risk Factor (ASRF) Model (I)

- Defaults are driven by a Gaussian variable defined by:

$$X_i = \sqrt{\rho}Z + \sqrt{1-\rho}Y_i$$

Where:

X_i	=	Gaussian
ρ	=	Correlation parameter
Z	=	Systematic factor (Gaussian)
Y_i	=	Idiosyncratic factor (Gaussian variable)
Φ	=	Cumulative normal cdf

- Any two variables X_i and X_j $(i \neq j)$ are correlated by ρ
- Default is defined by $1_{default_i} \Leftrightarrow 1_{X_i<k_i}$ with $k_i = \Phi^{-1}(PD_i)$
- This ensures that: $PD_i = E\left[1_{X_i<k_i}\right] = \Pr(X_i < k_i)$

Asymptotic Single Risk Factor (ASRF) Model (II)

- We can write the default probability as: $PD_i = \Pr(X_i < k_i)$ where $X_i = \sqrt{\rho}Z + \sqrt{1-\rho}Y_i$ as a combination of systematic (Z) and idiosyncratic components (Y_i)
- This leads to:

$$PD_i = \Pr\left(\sqrt{\rho}Z + \sqrt{1-\rho}Y_i < \Phi^{-1}(PD_i)\right)$$

$$= \Pr\left(\frac{\Phi^{-1}(PD_i) - \sqrt{\rho}Z}{\sqrt{1-\rho}} < Y_i\right) = \Phi\left(\frac{\Phi^{-1}(PD_i) - \sqrt{\rho}Z}{\sqrt{1-\rho}}\right)$$

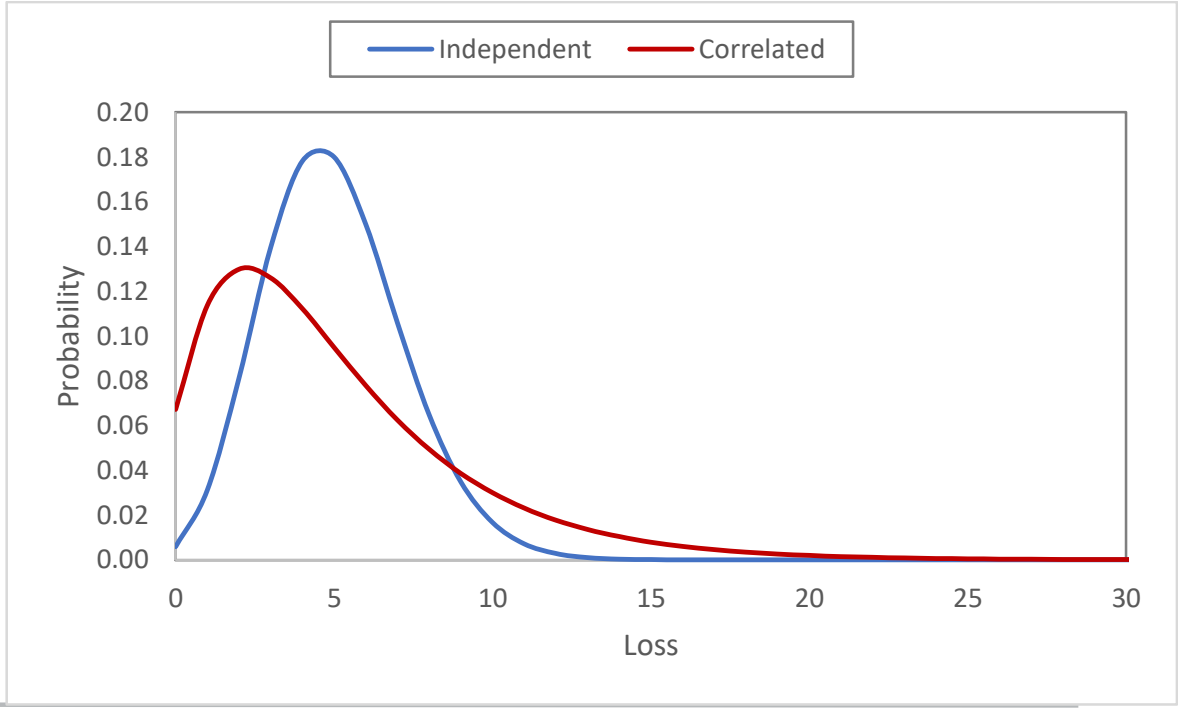
- This gives a formula for the default probability conditional on the value of the systematic variable Z
- This is sometimes known as conditional independence
- We can integrate over Z to find the loss distribution

Example

- Suppose equal default probabilities and $EAD_i = 1$ and $LGD_i = 0$ for all i
- The loss distribution for n assets assuming independence of defaults would be binomial

$$\Pr(L_p = X) = \binom{n}{k} PD^k (1 - PD)^{n-k}$$

- In the ASRF model, we simply need to integrate over the systematic factor and therefore it is a weighted average of binomial distributions (quadrature weights)



Asymptotic Single Risk Factor (ASRF) Model (III)

- The unexpected loss for a large diversified portfolio at a confidence level of α can be written as a linear combination of the constituents (Vasicek 1987):

$$UL_p = \sum_i \Phi\left(\frac{\Phi^{-1}(PD_i) - \sqrt{\rho}\Phi^{-1}(1-\alpha)}{\sqrt{1-\rho}}\right) \times LGD_i \times EAD_i$$

- The capital is therefore:

$$Capital = UL_p - EL_p$$
$$= \sum_i \left[\Phi\left(\frac{\Phi^{-1}(PD_i) - \sqrt{\rho}\Phi^{-1}(1-\alpha)}{\sqrt{1-\rho}}\right) - PD_i\right] \times LGD_i \times EAD_i$$

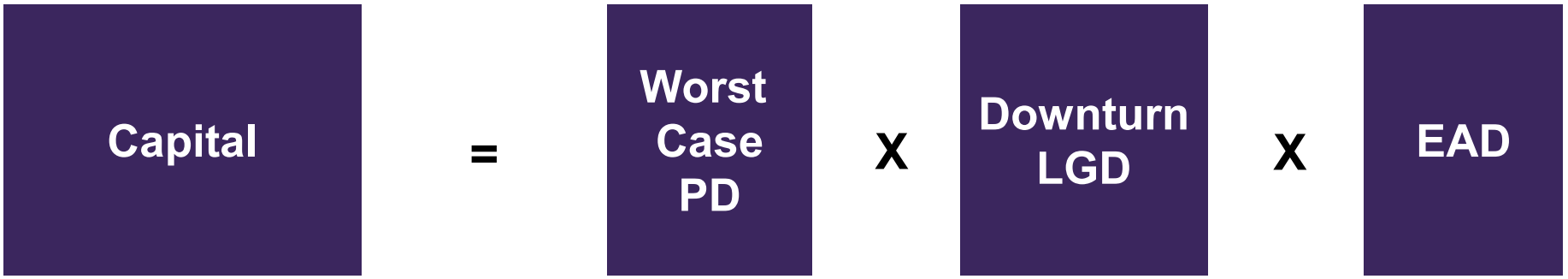
- *Granularity adjustments* can improve the approximation further

Portfolio Example

- Compare real numbers with simple formula

# loans	Size	PD	EL	UL	UL (approx.)
5	4,000	0.05%	7	141	90
20	2,500	0.10%	30	442	348
40	2,500	0.20%	120	1,591	1,241
20	2,500	1.00%	250	2,328	1,869
30	1,000	3.00%	315	1,808	1,775
30	1,000	4.00%	420	2,219	2,174
10	1,000	5.00%	175	863	845
5	1,000	10.00%	175	679	663
Portfolio			1,492	10,071	9,005

Regulatory Capital Approaches



Standardised approach	Risk Weight (based on rating and obligor type)	
Foundation IRB (internal ratings based)	Own PD Model	Regulator defined
Advanced IRB (internal ratings based)	Own PD Model	Own LGD Model

Simplified Regulatory Capital Calculation

In essence the capital for each obligor is driven by an extreme default probability (99.9% confidence level)

$$Capital_i = PD_i^{99.9\%} \times EAD_i \times LGD_i$$

- The PD formula is prescriptive and depends on obligor type
  - The **maturity** of the exposure
  - The **correlation** between different exposures

$$\text{Correlation } (R) = 0.12 * \frac{1 - EXP(-50 * PD)}{1 - EXP(-50)} + 0.24 * \left[1 - \frac{1 - EXP(-50 * PD)}{1 - EXP(-50)}\right]$$

$$\text{Maturity adjustment } (b) = [0.11852 - 0.05478 * \ln(PD)]^2$$

Capital requirement[72]

$$(K) = \left\{LGD * N\left[\sqrt{\frac{1}{1-R}} * G(PD) + \sqrt{\frac{R}{1-R}} * G(0.999)\right] - PD * LGD\right\} * \frac{1 + (M - 2.5) * b}{1 - 1.5 * b}$$

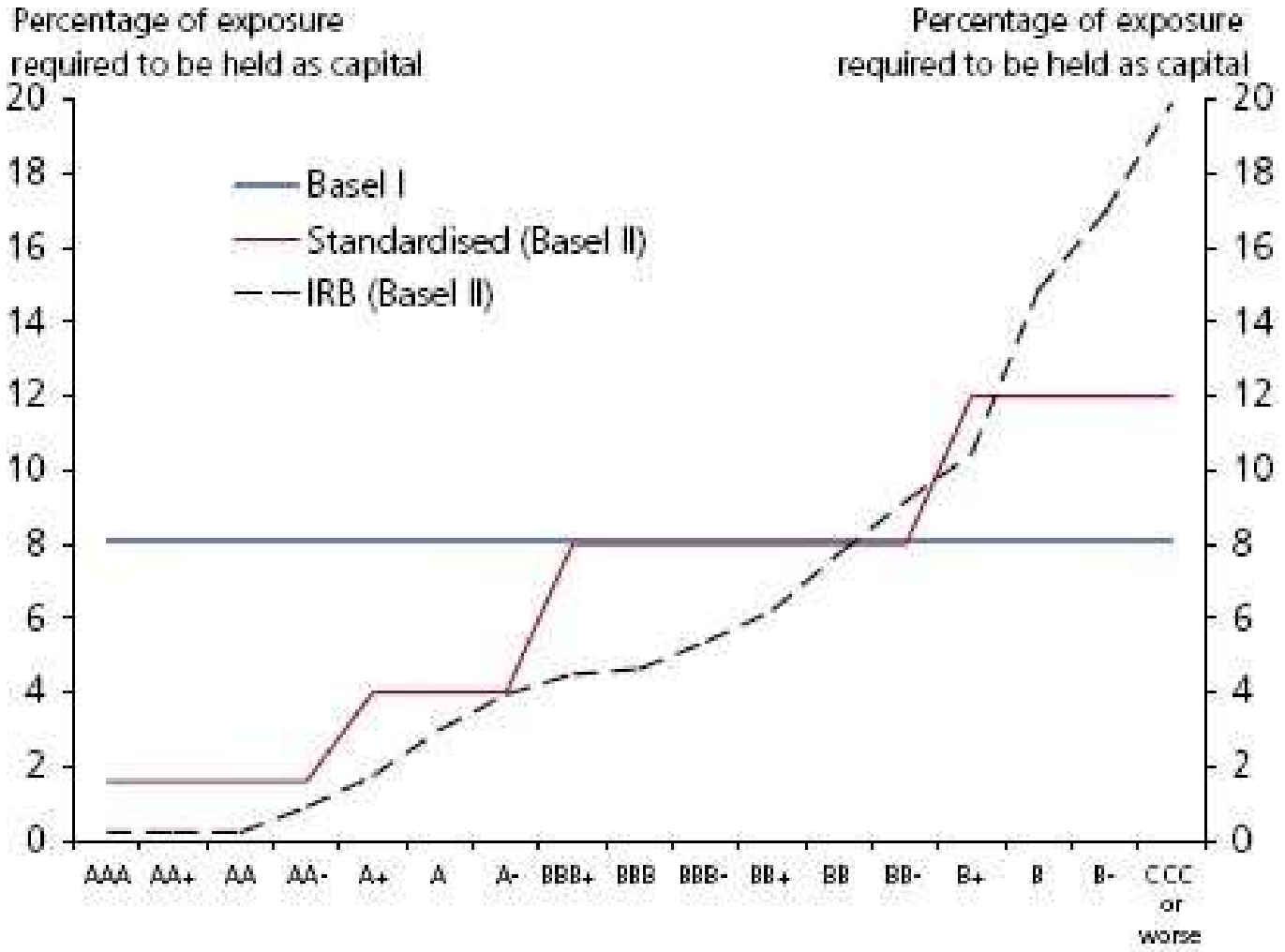
$$\text{Risk-weighted assets } (RWA) = K \text{ x } 12.5 \text{ x } EAD$$

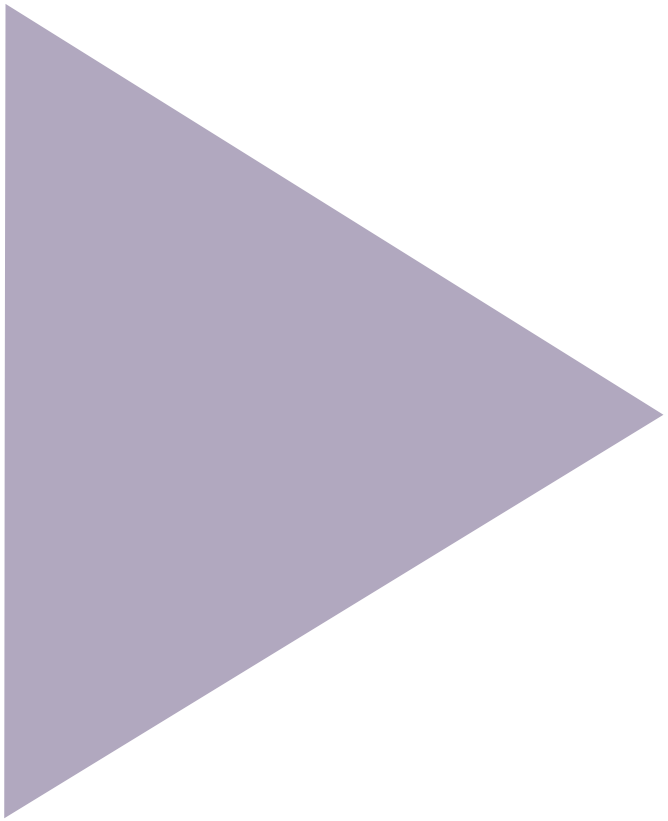
IRB Example (Assuming unit exposure)

	Example 1	Example 2	Calculation
PD (1-year)	0.12% (A rating)	2.3% (BB rating)	Internal ratings
Rho (ρ)	23.3%	15.8%	$0.12 \times [1 + \exp(-50 \times PD)]$
PD (99.9%)	3.78%	17.86%	$\Phi\left(\frac{\Phi^{-1}(PD) + \sqrt{\rho}\Phi^{-1}(99.9\%)}{\sqrt{1-\rho^2}}\right) - PD$
LGD	60%	45%	Internal calc / regulatory defined
Standardised[1]	50% × 8% = 4%	100% × 8% = 8%	
b	0.237	0.106	$(0.11852 - 0.05478 \times \ln(PD))^2$
Reg Maturity (M)	5	5	Maximum of 5-years
MA	2.47	1.50	$\frac{1 + (M - 2.5) \times b}{1 - 1.5 \times b}$
IRB Capital (K)	5.6%	12.1%	PD (99.9%) × LGD × MA

IRB Formula

Risk sensitivity of IRB formula





Summary

Summary

- Regulation can be really boring
- However:
  - It is really important and so many jobs in banks and other financial institutions have a substantial regulatory focus
  - There are challenging areas for quants, for example:
    - Fundamental review of the trading book (market risk)
    - New CVA capital rules (SA-CVA)
    - Initial margin models (e.g. ISDA SIMM™ – see next lecture)
  - Regulation is continuing to evolve with more complex methodologies supported by the latest innovations

Appendix:

Example Regulatory References

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The BCBS

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About the Basel Committee

Updated 10 August 2017

The Basel Committee mandate

The Basel Committee on Banking Supervision (BCBS) is the primary global standard setter for the prudential regulation of banks and provides a forum for cooperation on banking supervisory matters. Its mandate is to strengthen the regulation, supervision and practices of banks worldwide with the purpose of enhancing financial stability.

For a detailed overview of the BCBS mandate, view the full version of the Basel Committee Charter.

About the Basel Committee

- Charter
- Membership
- Work programme
- Organisation and governance
- Groups
- Policy development and implementation
- History

The Basel Committee's work

The core of the work undertaken by the Basel Committee focuses on the following activities:

- ***exchanging information on developments in the banking sector and financial markets*** to help identify current or emerging risks for the global financial system
- ***sharing supervisory issues, approaches and techniques*** to promote common understanding and to improve cross-border cooperation
- ***establishing and promoting global standards*** for the regulation and supervision of banks, as well as guidelines and sound practices
- ***addressing regulatory and supervisory gaps*** that pose risks to financial stability
- ***monitoring the implementation of BCBS standards*** in member countries and beyond to encourage their timely, consistent and effective implementation
- ***consulting with central banks and bank supervisory authorities which are not members of the BCBS*** to benefit from their input into the BCBS policy formulation process and to promote the implementation of BCBS standards, guidelines and sound practices beyond BCBS member countries
- ***coordinating and cooperating with other financial sector standard setters and international bodies***, particularly those involved in promoting financial stability

Visit the Basel Committee's work programme page for a detailed description of the Committee's work.

Upcoming meetings

The BCBS

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Basel Committee membership

Updated 30 December 2016

Membership - 28 jurisdictions / 45 institutions

The Basel Committee comprises 45 members from 28 jurisdictions, consisting of central banks and authorities with formal responsibility for the supervision of banking business. Additionally, the Committee has nine observers including central banks, supervisory groups, international organisations and other bodies. The Committee expanded its membership in 2009 and again in 2014.

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Institutions represented on the Basel Committee on Banking Supervision

Members

Country/jurisdiction	*Institutional representative*
Argentina	Central Bank of Argentina
Australia	Reserve Bank of Australia Australian Prudential Regulation Authority
Belgium	National Bank of Belgium
Brazil	Central Bank of Brazil
Canada	Bank of Canada Office of the Superintendent of Financial Institutions
China	People's Bank of China China Banking Regulatory Commission
European Union	European Central Bank European Central Bank Single Supervisory Mechanism

Basel III

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Basel III: international regulatory framework for banks

Highlights:

- Basel III: Capital (June 2011)
- Liquidity coverage ratio (LCR) (January 2013)
- Net stable funding ratio (NSFR) (October 2014)

"Basel III" is a comprehensive set of reform measures, developed by the Basel Committee on Banking Supervision, to strengthen the regulation, supervision and risk management of the banking sector. These measures aim to:

- improve the banking sector's ability to absorb shocks arising from financial and economic stress, whatever the source
- improve risk management and governance
- strengthen banks' transparency and disclosures.

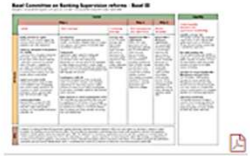
The reforms target:

- bank-level, or microprudential, regulation, which will help raise the resilience of individual banking institutions to periods of stress.
- macroprudential, system wide risks that can build up across the banking sector as well as the procyclical amplification of these risks over time.

These two approaches to supervision are complementary as greater resilience at the individual bank level reduces the risk of system wide shocks.

Basel III phase-in arrangements:

Basel III overview table:



Other languages
- Deutsch
- Español
- Français
- Italiano

Related information
- Basel II
- Basel III monitoring (QIS)
- Progress reports on Basel III implementation

Basel III counterparty credit risk and exposures to central counterparties - Frequently asked questions

This document sets out the set of frequently asked questions that relate to counterparty credit risk and exposures to central counterparties of the Basel III rules text.

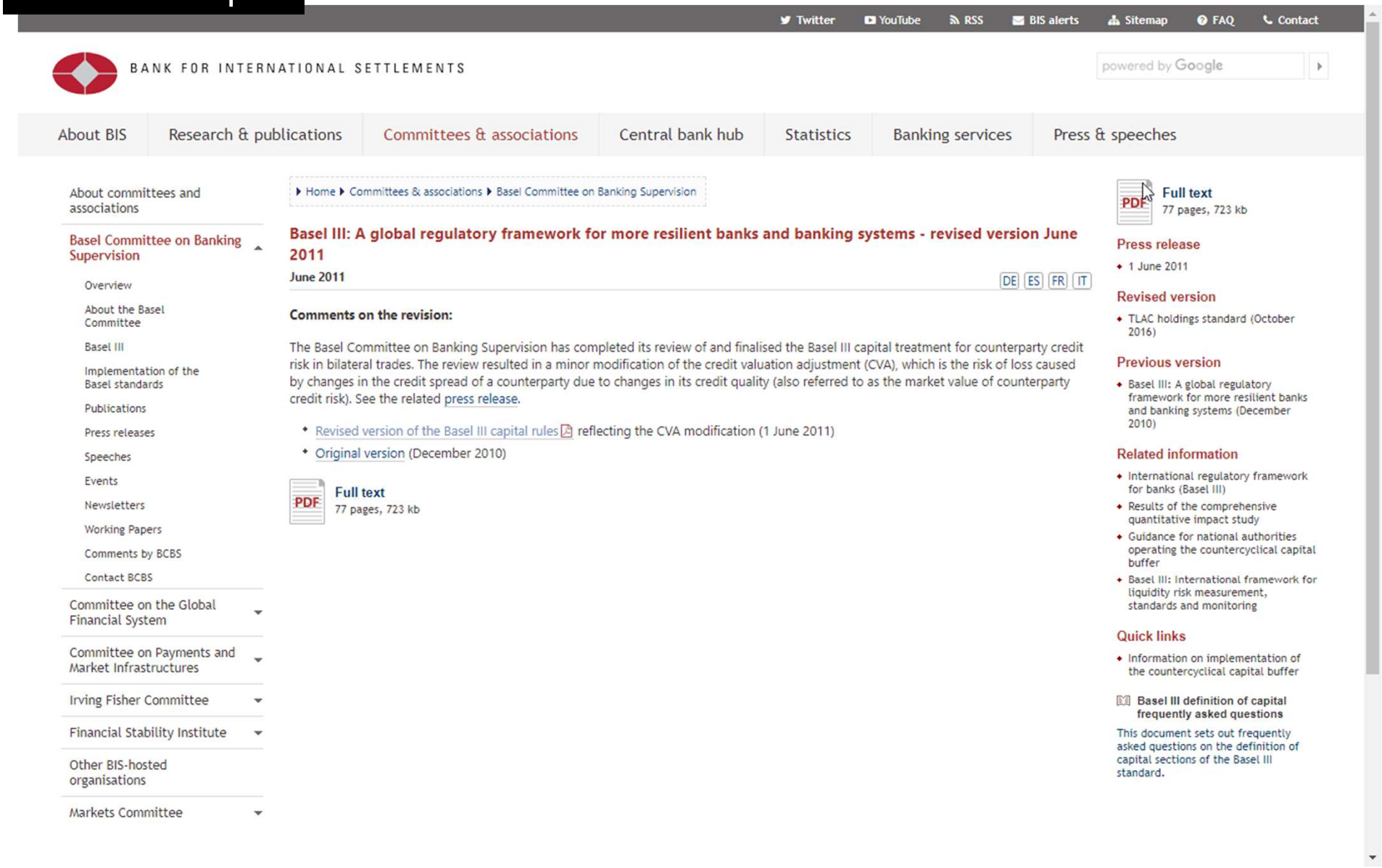
Basel III definition of capital - Frequently asked questions

This document sets out the set of frequently asked questions that relate to the definition of capital of the Basel III rules text.

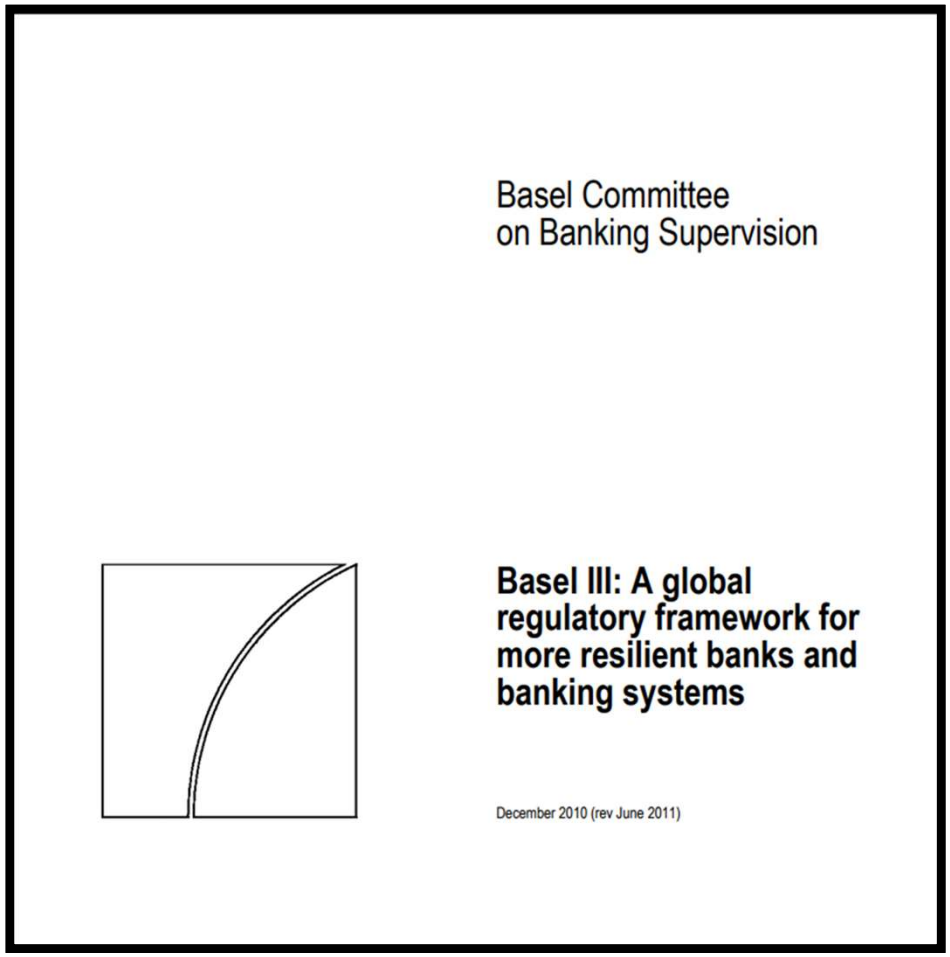
Basel III framework for liquidity - Frequently asked questions

This document sets out the first set of frequently asked questions that relate to Basel III's liquidity rules.

Basel III: Capital

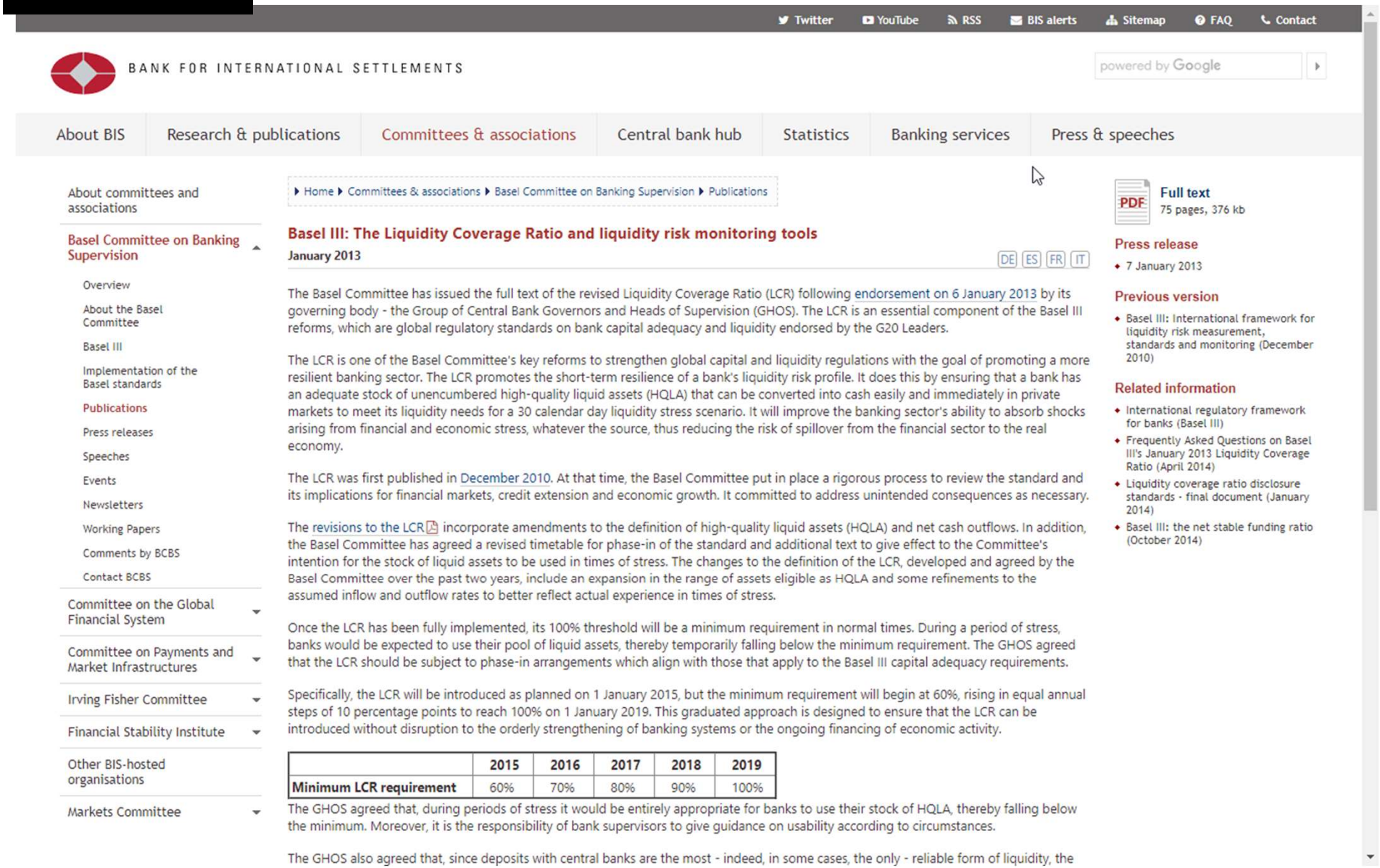


Basel III: Capital



aka: bcbs189

Basel III: LCR



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Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools

January 2013

DE ES FR IT

The Basel Committee has issued the full text of the revised Liquidity Coverage Ratio (LCR) following endorsement on 6 January 2013 by its governing body - the Group of Central Bank Governors and Heads of Supervision (GHOS). The LCR is an essential component of the Basel III reforms, which are global regulatory standards on bank capital adequacy and liquidity endorsed by the G20 Leaders.

The LCR is one of the Basel Committee's key reforms to strengthen global capital and liquidity regulations with the goal of promoting a more resilient banking sector. The LCR promotes the short-term resilience of a bank's liquidity risk profile. It does this by ensuring that a bank has an adequate stock of unencumbered high-quality liquid assets (HQLA) that can be converted into cash easily and immediately in private markets to meet its liquidity needs for a 30 calendar day liquidity stress scenario. It will improve the banking sector's ability to absorb shocks arising from financial and economic stress, whatever the source, thus reducing the risk of spillover from the financial sector to the real economy.

The LCR was first published in December 2010. At that time, the Basel Committee put in place a rigorous process to review the standard and its implications for financial markets, credit extension and economic growth. It committed to address unintended consequences as necessary.

The revisions to the LCR incorporate amendments to the definition of high-quality liquid assets (HQLA) and net cash outflows. In addition, the Basel Committee has agreed a revised timetable for phase-in of the standard and additional text to give effect to the Committee's intention for the stock of liquid assets to be used in times of stress. The changes to the definition of the LCR, developed and agreed by the Basel Committee over the past two years, include an expansion in the range of assets eligible as HQLA and some refinements to the assumed inflow and outflow rates to better reflect actual experience in times of stress.

Once the LCR has been fully implemented, its 100% threshold will be a minimum requirement in normal times. During a period of stress, banks would be expected to use their pool of liquid assets, thereby temporarily falling below the minimum requirement. The GHOS agreed that the LCR should be subject to phase-in arrangements which align with those that apply to the Basel III capital adequacy requirements.

Specifically, the LCR will be introduced as planned on 1 January 2015, but the minimum requirement will begin at 60%, rising in equal annual steps of 10 percentage points to reach 100% on 1 January 2019. This graduated approach is designed to ensure that the LCR can be introduced without disruption to the orderly strengthening of banking systems or the ongoing financing of economic activity.

	2015	2016	2017	2018	2019
Minimum LCR requirement	60%	70%	80%	90%	100%

The GHOS agreed that, during periods of stress it would be entirely appropriate for banks to use their stock of HQLA, thereby falling below the minimum. Moreover, it is the responsibility of bank supervisors to give guidance on usability according to circumstances.

The GHOS also agreed that, since deposits with central banks are the most - indeed, in some cases, the only - reliable form of liquidity, the

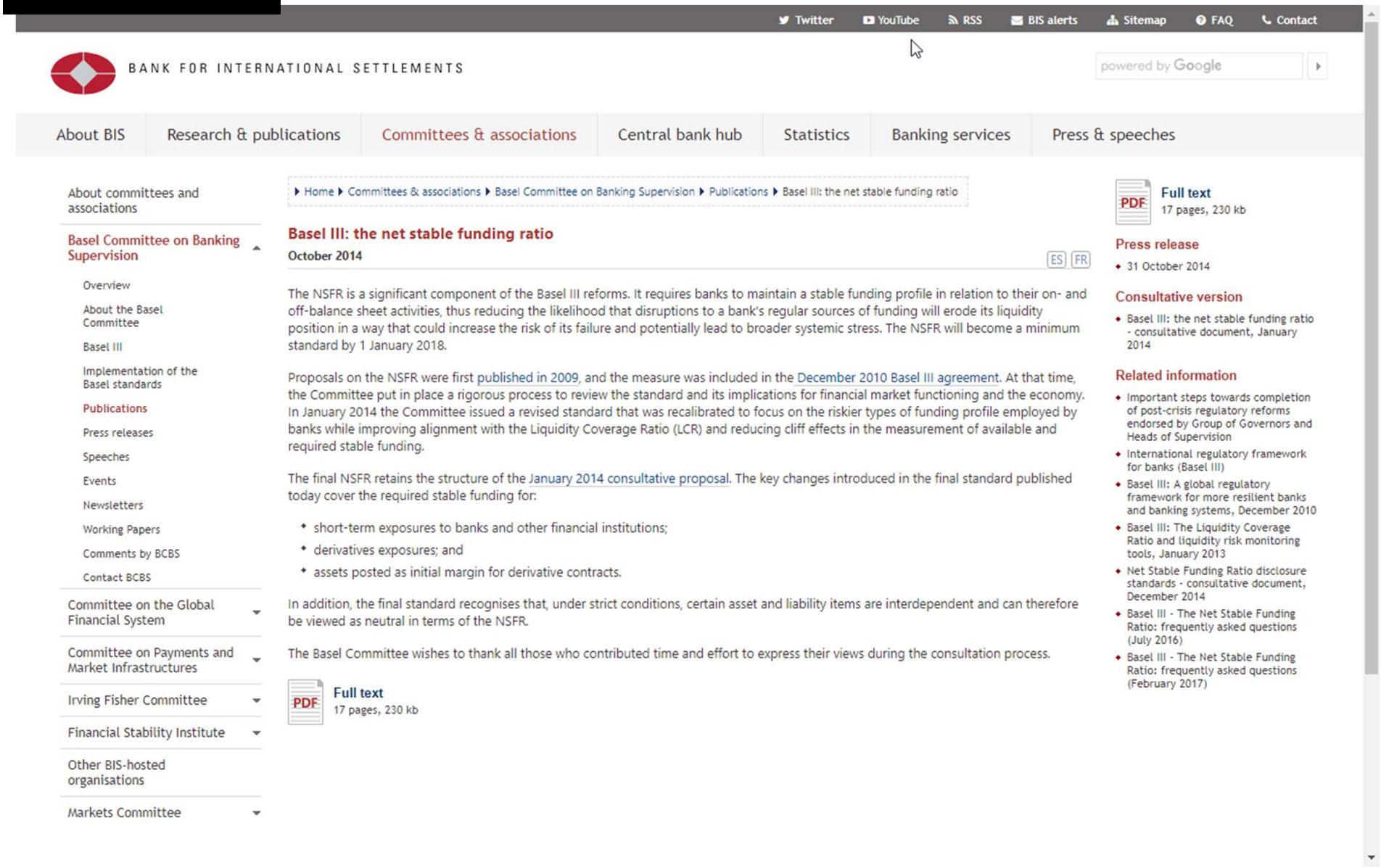
PDF **Full text**
75 pages, 376 kb

Press release
- 7 January 2013

Previous version
- Basel III: International framework for liquidity risk measurement, standards and monitoring (December 2010)

Related information
- International regulatory framework for banks (Basel III)
- Frequently Asked Questions on Basel III's January 2013 Liquidity Coverage Ratio (April 2014)
- Liquidity coverage ratio disclosure standards - final document (January 2014)
- Basel III: the net stable funding ratio (October 2014)

Basel III: NSFR



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Basel III: the net stable funding ratio

October 2014

ES FR

The NSFR is a significant component of the Basel III reforms. It requires banks to maintain a stable funding profile in relation to their on- and off-balance sheet activities, thus reducing the likelihood that disruptions to a bank's regular sources of funding will erode its liquidity position in a way that could increase the risk of its failure and potentially lead to broader systemic stress. The NSFR will become a minimum standard by 1 January 2018.

Proposals on the NSFR were first published in 2009, and the measure was included in the December 2010 Basel III agreement. At that time, the Committee put in place a rigorous process to review the standard and its implications for financial market functioning and the economy. In January 2014 the Committee issued a revised standard that was recalibrated to focus on the riskier types of funding profile employed by banks while improving alignment with the Liquidity Coverage Ratio (LCR) and reducing cliff effects in the measurement of available and required stable funding.

The final NSFR retains the structure of the January 2014 consultative proposal. The key changes introduced in the final standard published today cover the required stable funding for:

- short-term exposures to banks and other financial institutions;
- derivatives exposures; and
- assets posted as initial margin for derivative contracts.

In addition, the final standard recognises that, under strict conditions, certain asset and liability items are interdependent and can therefore be viewed as neutral in terms of the NSFR.

The Basel Committee wishes to thank all those who contributed time and effort to express their views during the consultation process.

PDF **Full text**
17 pages, 230 kb

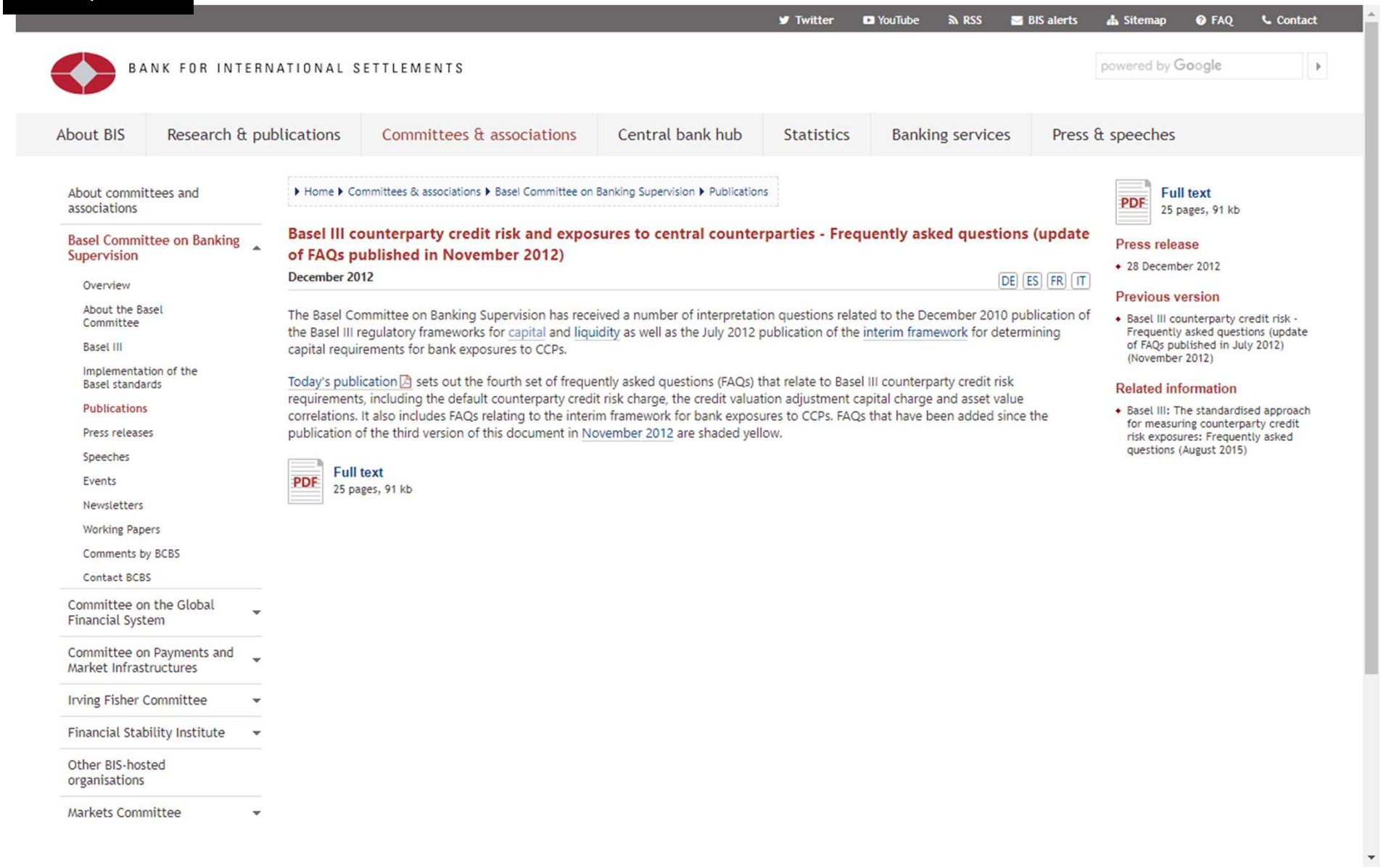
PDF **Full text**
17 pages, 230 kb

Press release
- 31 October 2014

Consultative version
- Basel III: the net stable funding ratio - consultative document, January 2014

Related information
- Important steps towards completion of post-crisis regulatory reforms endorsed by Group of Governors and Heads of Supervision
- International regulatory framework for banks (Basel III)
- Basel III: A global regulatory framework for more resilient banks and banking systems, December 2010
- Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools, January 2013
- Net Stable Funding Ratio disclosure standards - consultative document, December 2014
- Basel III - The Net Stable Funding Ratio: frequently asked questions (July 2016)
- Basel III - The Net Stable Funding Ratio: frequently asked questions (February 2017)

FAQ: CCR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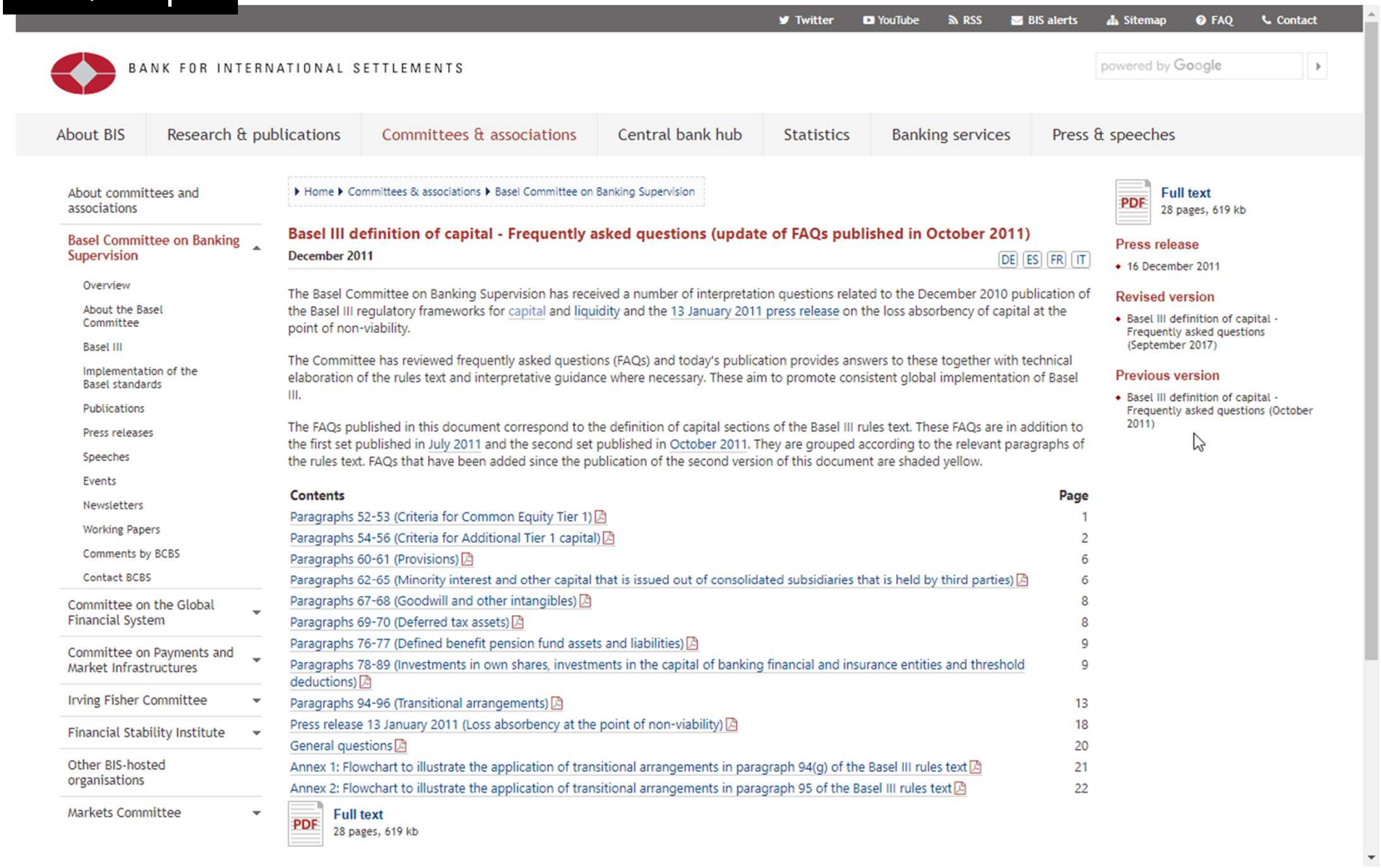
Basel III counterparty credit risk and exposures to central counterparties - Frequently asked questions (update of FAQs published in November 2012)
December 2012
DE ES FR IT
The Basel Committee on Banking Supervision has received a number of interpretation questions related to the December 2010 publication of the Basel III regulatory frameworks for capital and liquidity as well as the July 2012 publication of the interim framework for determining capital requirements for bank exposures to CCPs.
Today's publication sets out the fourth set of frequently asked questions (FAQs) that relate to Basel III counterparty credit risk requirements, including the default counterparty credit risk charge, the credit valuation adjustment capital charge and asset value correlations. It also includes FAQs relating to the interim framework for bank exposures to CCPs. FAQs that have been added since the publication of the third version of this document in November 2012 are shaded yellow.
PDF
Full text
25 pages, 91 kb
PDF
Full text
25 pages, 91 kb
Press release
28 December 2012
Previous version
Basel III counterparty credit risk - Frequently asked questions (update of FAQs published in July 2012) (November 2012)
Related information
Basel III: The standardised approach for measuring counterparty credit risk exposures: Frequently asked questions (August 2015)

FAQ: Capital



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Basel III definition of capital - Frequently asked questions (update of FAQs published in October 2011)

December 2011 DE ES FR IT

The Basel Committee on Banking Supervision has received a number of interpretation questions related to the December 2010 publication of the Basel III regulatory frameworks for capital and liquidity and the 13 January 2011 press release on the loss absorbency of capital at the point of non-viability.

The Committee has reviewed frequently asked questions (FAQs) and today's publication provides answers to these together with technical elaboration of the rules text and interpretative guidance where necessary. These aim to promote consistent global implementation of Basel III.

The FAQs published in this document correspond to the definition of capital sections of the Basel III rules text. These FAQs are in addition to the first set published in July 2011 and the second set published in October 2011. They are grouped according to the relevant paragraphs of the rules text. FAQs that have been added since the publication of the second version of this document are shaded yellow.

Contents **Page**

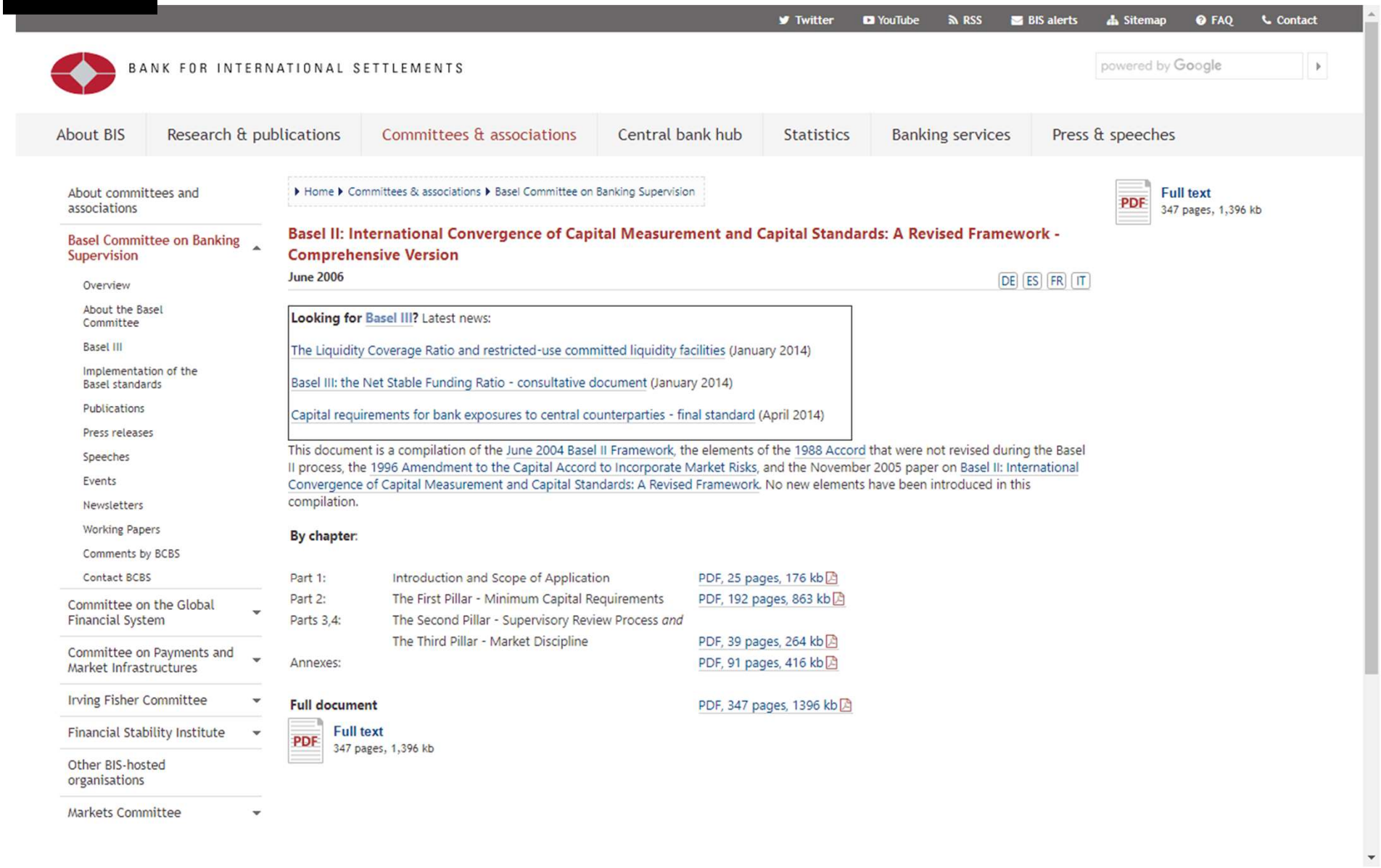
PDF **Full text**
28 pages, 619 kb

Press release
- 16 December 2011

Revised version
- Basel III definition of capital - Frequently asked questions (September 2017)

Previous version
- Basel III definition of capital - Frequently asked questions (October 2011)

Basel II



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PDF Full text
347 pages, 1,396 kb

Basel II: International Convergence of Capital Measurement and Capital Standards: A Revised Framework - Comprehensive Version

June 2006

DE ES FR IT

Looking for Basel III? Latest news:

The Liquidity Coverage Ratio and restricted-use committed liquidity facilities (January 2014)

Basel III: the Net Stable Funding Ratio - consultative document (January 2014)

Capital requirements for bank exposures to central counterparties - final standard (April 2014)

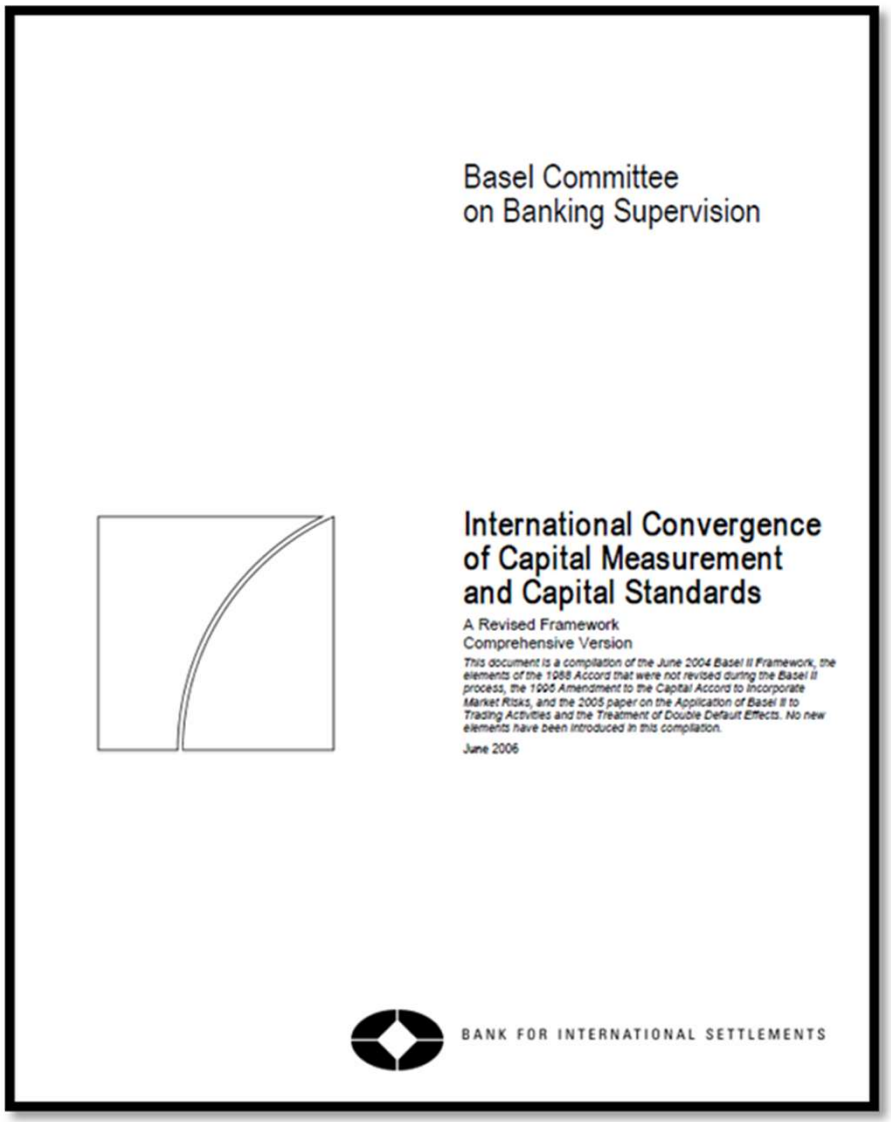
This document is a compilation of the June 2004 Basel II Framework, the elements of the 1988 Accord that were not revised during the Basel II process, the 1996 Amendment to the Capital Accord to Incorporate Market Risks, and the November 2005 paper on Basel II: International Convergence of Capital Measurement and Capital Standards: A Revised Framework. No new elements have been introduced in this compilation.

By chapter:

Part 1:	Introduction and Scope of Application	PDF, 25 pages, 176 kb
Part 2:	The First Pillar - Minimum Capital Requirements	PDF, 192 pages, 863 kb
Parts 3,4:	The Second Pillar - Supervisory Review Process *and*	
	The Third Pillar - Market Discipline	PDF, 39 pages, 264 kb
Annexes:		PDF, 91 pages, 416 kb
Full document		PDF, 347 pages, 1396 kb

PDF Full text
347 pages, 1,396 kb

Basel II



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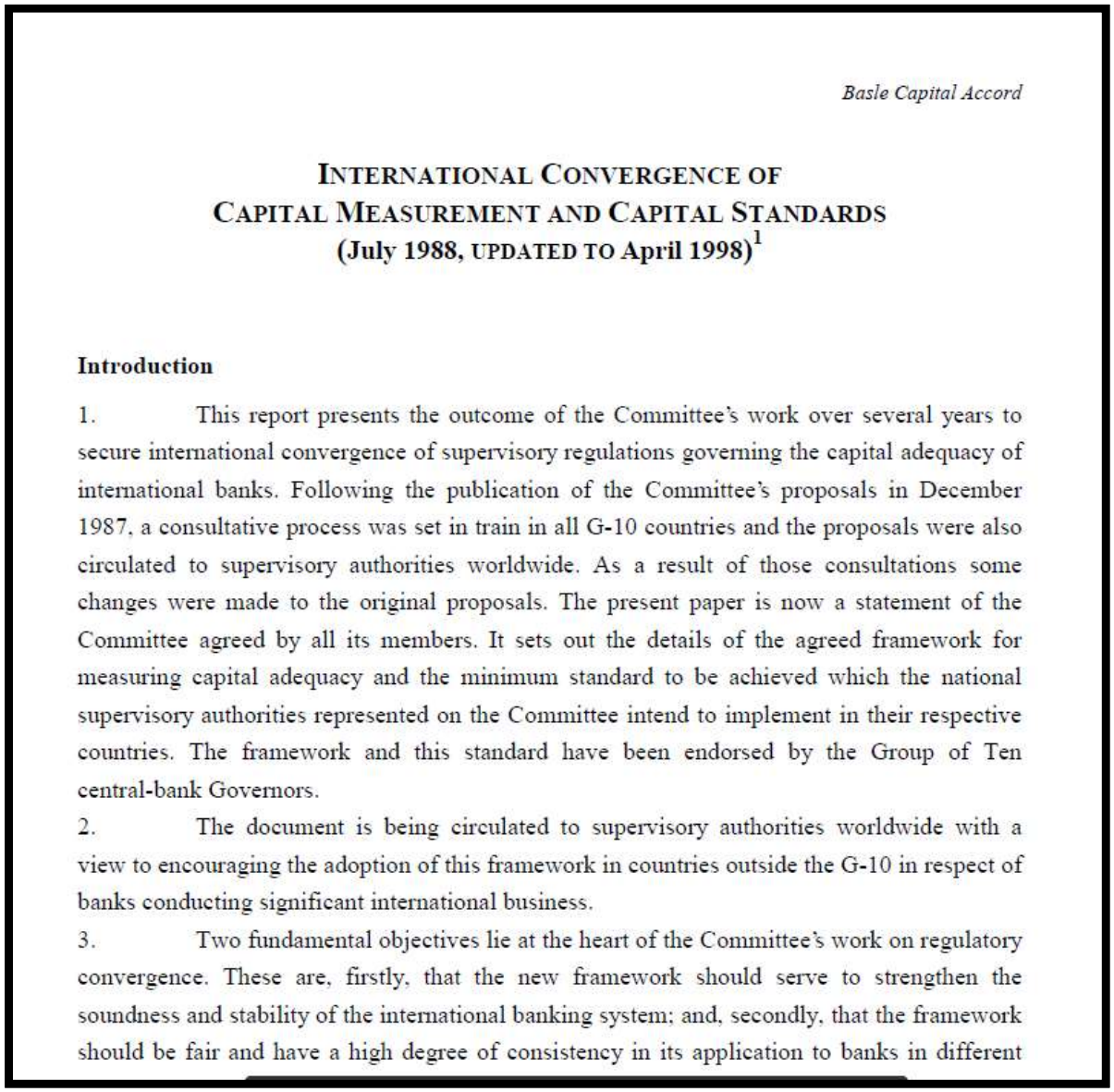
Basel I



Basle Capital Accord

INTERNATIONAL CONVERGENCE OF CAPITAL MEASUREMENT AND CAPITAL STANDARDS (July 1988, UPDATED TO April 1998)[1]

Introduction

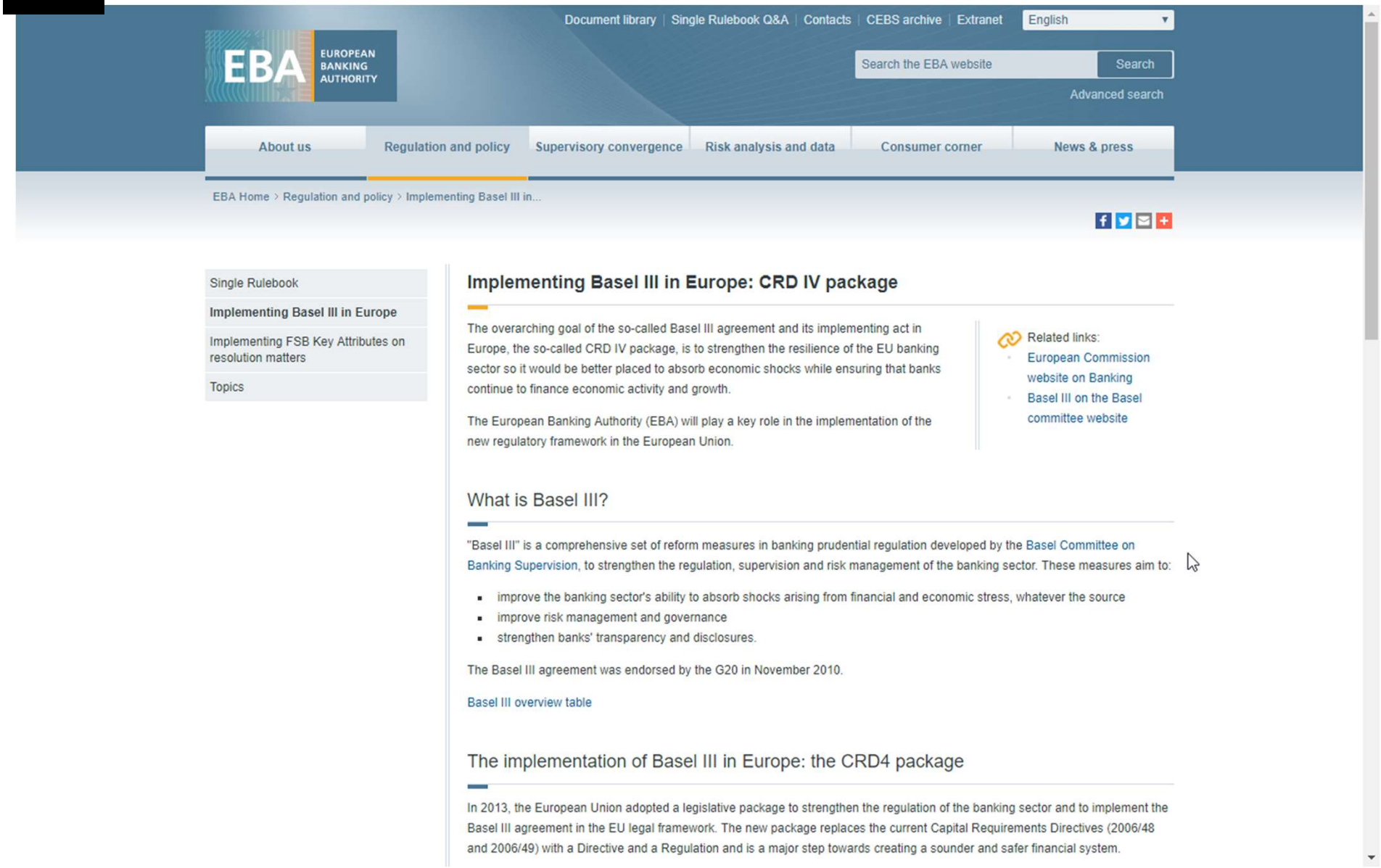
1. This report presents the outcome of the Committee's work over several years to secure international convergence of supervisory regulations governing the capital adequacy of international banks. Following the publication of the Committee's proposals in December 1987, a consultative process was set in train in all G-10 countries and the proposals were also circulated to supervisory authorities worldwide. As a result of those consultations some changes were made to the original proposals. The present paper is now a statement of the Committee agreed by all its members. It sets out the details of the agreed framework for measuring capital adequacy and the minimum standard to be achieved which the national supervisory authorities represented on the Committee intend to implement in their respective countries. The framework and this standard have been endorsed by the Group of Ten central-bank Governors.

2. The document is being circulated to supervisory authorities worldwide with a view to encouraging the adoption of this framework in countries outside the G-10 in respect of banks conducting significant international business.

3. Two fundamental objectives lie at the heart of the Committee's work on regulatory convergence. These are, firstly, that the new framework should serve to strengthen the soundness and stability of the international banking system; and, secondly, that the framework should be fair and have a high degree of consistency in its application to banks in different

aka: bcbs111

EBA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Implementing Basel III in Europe
Implementing FSB Key Attributes on resolution matters
Topics
Implementing Basel III in Europe: CRD IV package
The overarching goal of the so-called Basel III agreement and its implementing act in Europe, the so-called CRD IV package, is to strengthen the resilience of the EU banking sector so it would be better placed to absorb economic shocks while ensuring that banks continue to finance economic activity and growth.
The European Banking Authority (EBA) will play a key role in the implementation of the new regulatory framework in the European Union.
Related links:
European Commission website on Banking
Basel III on the Basel committee website
What is Basel III?
"Basel III" is a comprehensive set of reform measures in banking prudential regulation developed by the Basel Committee on Banking Supervision, to strengthen the regulation, supervision and risk management of the banking sector. These measures aim to:
improve the banking sector's ability to absorb shocks arising from financial and economic stress, whatever the source
improve risk management and governance
strengthen banks' transparency and disclosures.
The Basel III agreement was endorsed by the G20 in November 2010.
Basel III overview table
The implementation of Basel III in Europe: the CRD4 package
In 2013, the European Union adopted a legislative package to strengthen the regulation of the banking sector and to implement the Basel III agreement in the EU legal framework. The new package replaces the current Capital Requirements Directives (2006/48 and 2006/49) with a Directive and a Regulation and is a major step towards creating a sounder and safer financial system.

EBA

EBA REPORT ON CVA

EBA EUROPEAN BANKING AUTHORITY

EBA Report on CVA

25 February 2015

EBA Report

On Credit Valuation Adjustment (CVA) under Article 456(2) of Regulation (EU) No 575/2013 (Capital Requirements Regulation — CRR)

and

EBA Review

On the application of CVA charges to non-financial counterparties established in a third country under Article 382(5) of Regulation (EU) No 575/2013 (Capital Requirements Regulation — CRR)

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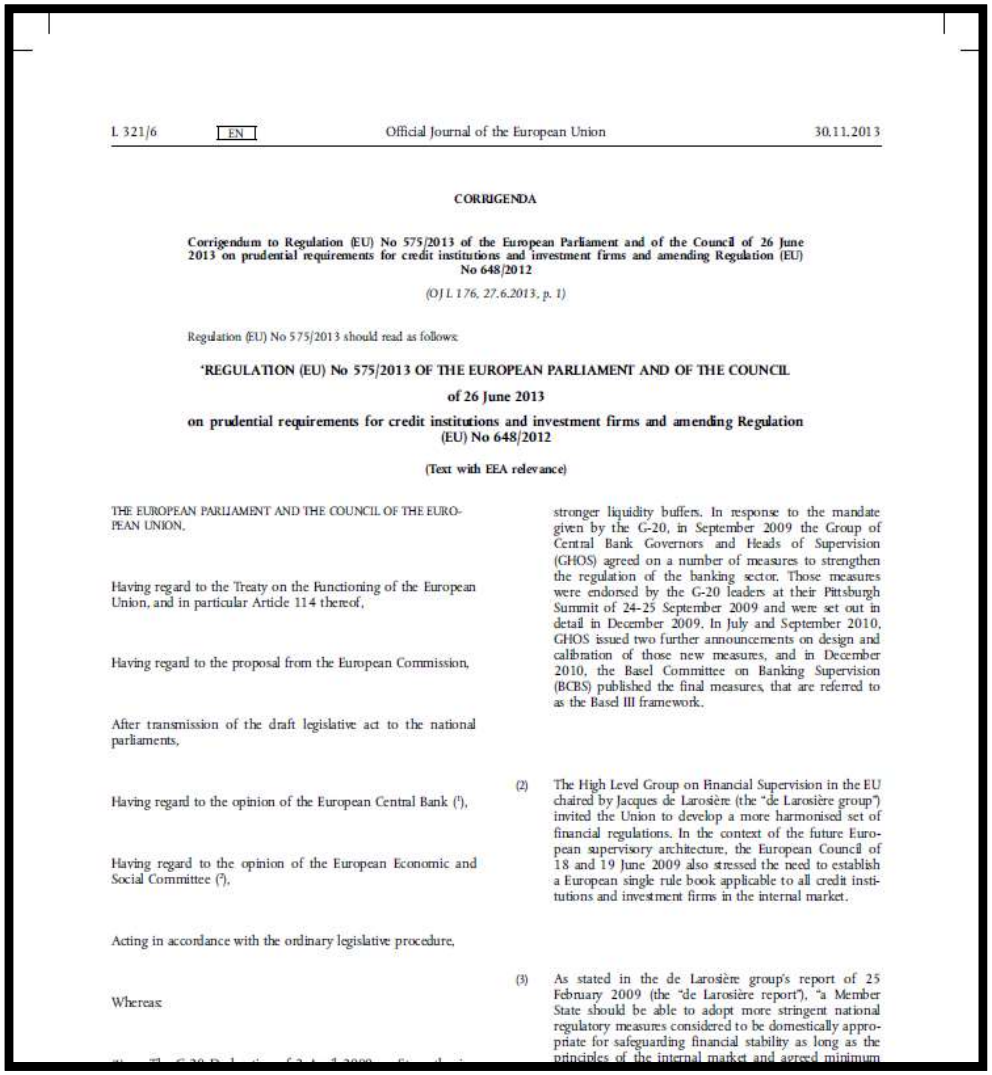
The most recent information from the Basel Committee on Banking Supervision (BCBS) can be found on the website for the Bank for International Settlements.
The aggregate global indicator amounts for each systemic indicator (GSIB denominators) for use in the Board's GSIB risk-based capital surcharge can be found here.
Basel III Implementation
Announcements | Rulemaking | Tools
Announcements
November 18, 2014
Agencies propose technical corrections and clarifications to the capital rules applicable to advanced approaches banking organizations
Press Release
December 6, 2013
Federal Reserve Board issues final rule aligning market risk capital rule with Basel III
Press Release
October 24, 2013
Federal Reserve Board issued proposed rules to strengthen the liquidity positions of large financial institutions
Press Release
September 24, 2013
Federal Reserve Board issues interim final rules clarifying how companies
U.S. Implementation of the Basel Accords:
Basel III Implementation
Basel II Advanced approaches implementation
Basel II Standardized approach implementation
Basel I Revisions (Basel IA)
Market Risk revisions
Archived announcements and other related documents

Source: https://upload.wikimedia.org/wikipedia/commons/thumb/1/1e/European_Parliament_logo.svg/640px-European_Parliament_logo.svg.png
Source: https://regmedia.co.uk/2015/10/26/european-parliament.jpg?x=1200&y=794

Capital Requirements Regulation (575/2013)



L 321/6 EN Official Journal of the European Union 30.11.2013

CORRIGENDA

Corrigendum to Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012

(OJ L 176, 27.6.2013, p. 1)

Regulation (EU) No 575/2013 should read as follows:

'REGULATION (EU) No 575/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 26 June 2013

on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012

(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 114 thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national parliaments,

Having regard to the opinion of the European Central Bank (1),

Having regard to the opinion of the European Economic and Social Committee (2),

Acting in accordance with the ordinary legislative procedure,

Whereas:

stronger liquidity buffers. In response to the mandate given by the G-20, in September 2009 the Group of Central Bank Governors and Heads of Supervision (GHOS) agreed on a number of measures to strengthen the regulation of the banking sector. Those measures were endorsed by the G-20 leaders at their Pittsburgh Summit of 24-25 September 2009 and were set out in detail in December 2009. In July and September 2010, GHOS issued two further announcements on design and calibration of those new measures, and in December 2010, the Basel Committee on Banking Supervision (BCBS) published the final measures, that are referred to as the Basel III framework.

(2) The High Level Group on Financial Supervision in the EU chaired by Jacques de Larosière (the "de Larosière group") invited the Union to develop a more harmonised set of financial regulations. In the context of the future European supervisory architecture, the European Council of 18 and 19 June 2009 also stressed the need to establish a European single rule book applicable to all credit institutions and investment firms in the internal market.

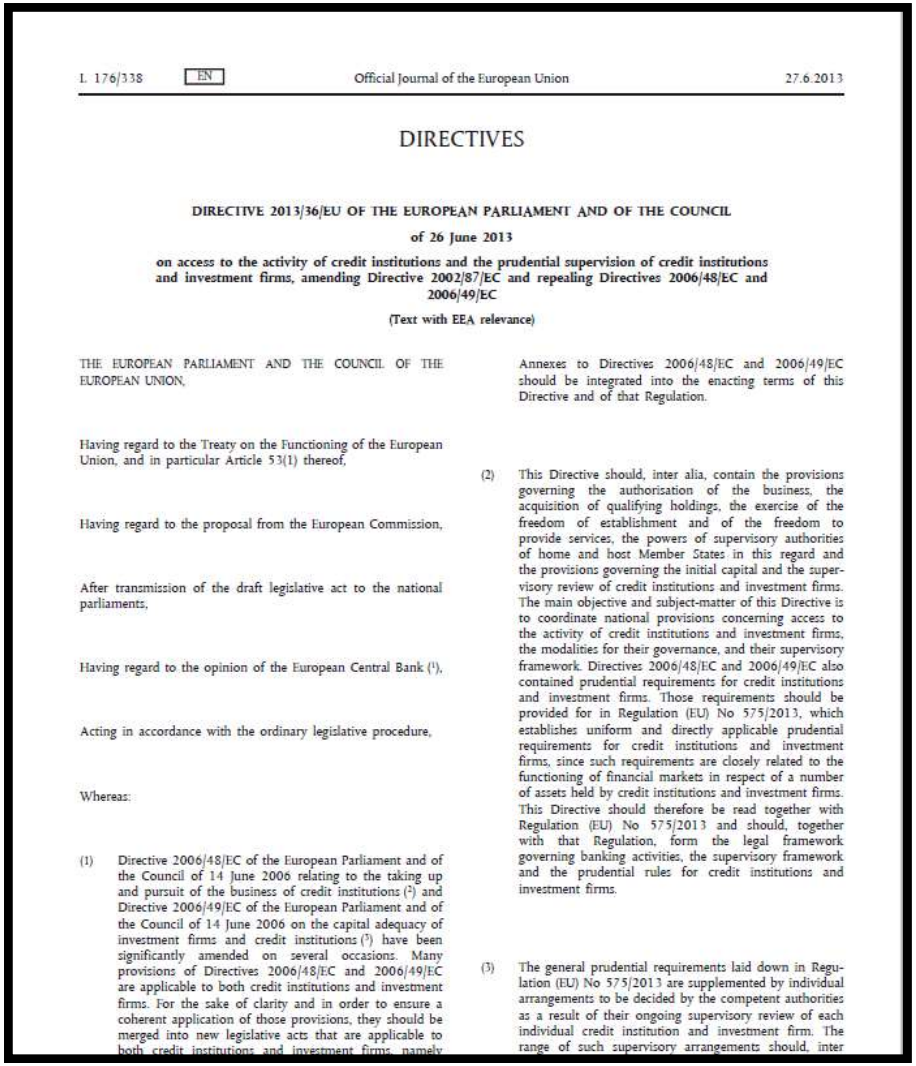
(3) As stated in the de Larosière group's report of 25 February 2009 (the "de Larosière report"), "a Member State should be able to adopt more stringent national regulatory measures considered to be domestically appropriate for safeguarding financial stability as long as the principles of the internal market and agreed minimum

Capital Requirements Regulation (2013*): Official Journal of the European Union.*
Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012 Text with EEA relevance.

Source: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32013R0575

CRR (Pilar 1)

Capital Requirements Directive (2013/36/EU)



L 176/338 EN Official Journal of the European Union 27.6.2013

DIRECTIVES

DIRECTIVE 2013/36/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 26 June 2013

on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC

(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 53(1) thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national parliaments,

Having regard to the opinion of the European Central Bank (1),

Acting in accordance with the ordinary legislative procedure,

Whereas:

(1) Directive 2006/48/EC of the European Parliament and of the Council of 14 June 2006 relating to the taking up and pursuit of the business of credit institutions (2) and Directive 2006/49/EC of the European Parliament and of the Council of 14 June 2006 on the capital adequacy of investment firms and credit institutions (3) have been significantly amended on several occasions. Many provisions of Directives 2006/48/EC and 2006/49/EC are applicable to both credit institutions and investment firms. For the sake of clarity and in order to ensure a coherent application of those provisions, they should be merged into new legislative acts that are applicable to both credit institutions and investment firms, namely

Annexes to Directives 2006/48/EC and 2006/49/EC should be integrated into the enacting terms of this Directive and of that Regulation.

(2) This Directive should, inter alia, contain the provisions governing the authorisation of the business, the acquisition of qualifying holdings, the exercise of the freedom of establishment and of the freedom to provide services, the powers of supervisory authorities of home and host Member States in this regard and the provisions governing the initial capital and the supervisory review of credit institutions and investment firms. The main objective and subject-matter of this Directive is to coordinate national provisions concerning access to the activity of credit institutions and investment firms, the modalities for their governance, and their supervisory framework. Directives 2006/48/EC and 2006/49/EC also contained prudential requirements for credit institutions and investment firms. Those requirements should be provided for in Regulation (EU) No 575/2013, which establishes uniform and directly applicable prudential requirements for credit institutions and investment firms, since such requirements are closely related to the functioning of financial markets in respect of a number of assets held by credit institutions and investment firms. This Directive should therefore be read together with Regulation (EU) No 575/2013 and should, together with that Regulation, form the legal framework governing banking activities, the supervisory framework and the prudential rules for credit institutions and investment firms.

(3) The general prudential requirements laid down in Regulation (EU) No 575/2013 are supplemented by individual arrangements to be decided by the competent authorities as a result of their ongoing supervisory review of each individual credit institution and investment firm. The range of such supervisory arrangements should, inter

Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC Text with EEA relevance

Source: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013L0036&from=IT

CRD IV (Pilar 2)