

Webinar on Banking Finance & Investments

19th December 2020, Saturday

03-00 PM to 04-30 PM (India Standard Time)

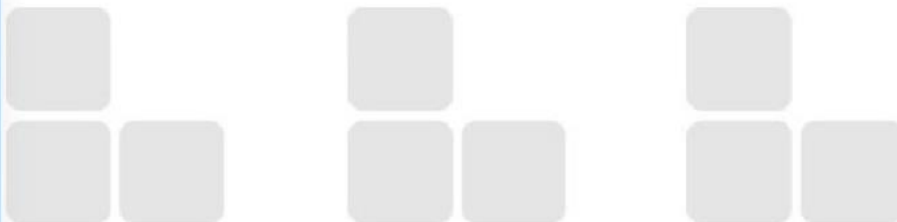
Opportunities for actuaries in Banking: assessment of capital adequacy and product pricing
Iain Allan



Opportunities for actuaries in banking



Assessment of capital adequacy
Product pricing and profitability
Current issues



Iain Allan - Movement into banking



1969-74	Scottish Life	Fund management
1974-79	UKProvident	Fund management
1979-85	Phillips & Drew*	Stockbroking
1985-91	UBS	Investment banking

*In 1985, Phillips & Drew was acquired by UBS

Iain Allan - Experience in banking



1994-2008 Group Director, Strategy, RBS

- Supermarket banking joint venture with Tesco
- Acquisition of NatWest
- Strategic partnership with Bank of China

Iain Allan - Experience in banking



2008 - 2019 Independent consultant

- Applications for banking licences by new entrants
- Regulatory submissions by smaller banks
- Draft responses to regulatory consultations

Banking



Liabilities

Deposits
Other liabilities
Equity capital

Assets

Liquid assets
Loans
Other assets

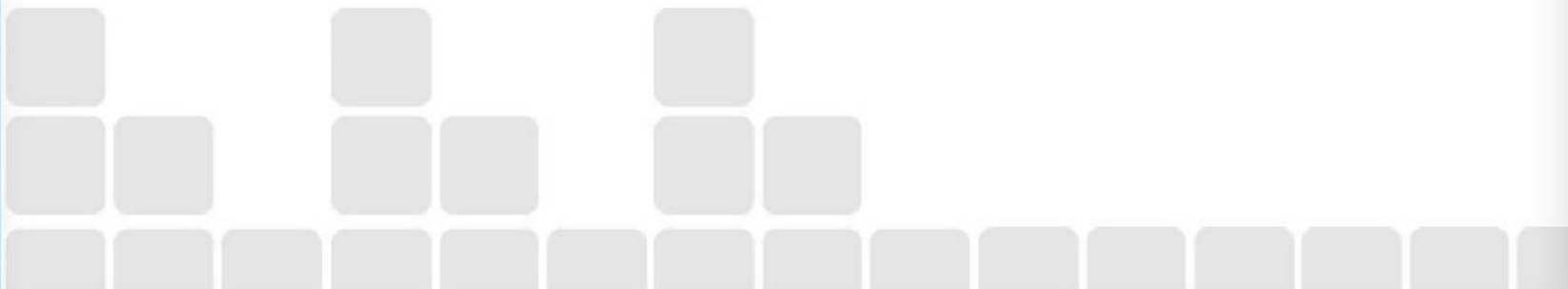
Main risks

Credit risk
Operational risk
Market risk

- Banks hold equity capital against possible losses on assets
- Banks hold liquidity against possible withdrawals on deposits

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Internal Capital Adequacy Assessment Process (ICAAP)



Banks – Basel regulations

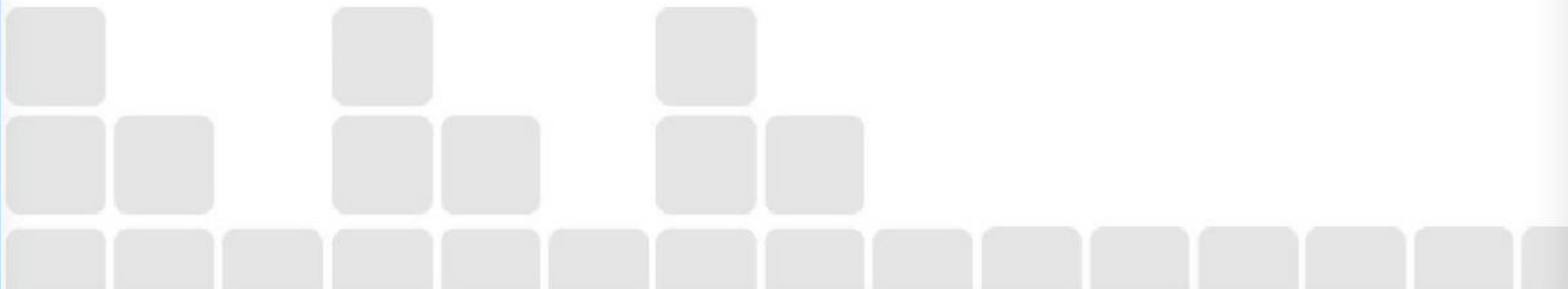


Three pillars

- Pillar 1: Quantification of capital requirements
- Quantification of liquidity requirements
- Pillar 2: Risk management and supervisory review process
- Pillar 3: Requirements for public disclosures

Regulatory submissions

- Internal Capital Adequacy Assessment Process (ICAAP)
- Internal Liquidity Adequacy Assessment Process (ILAAP)



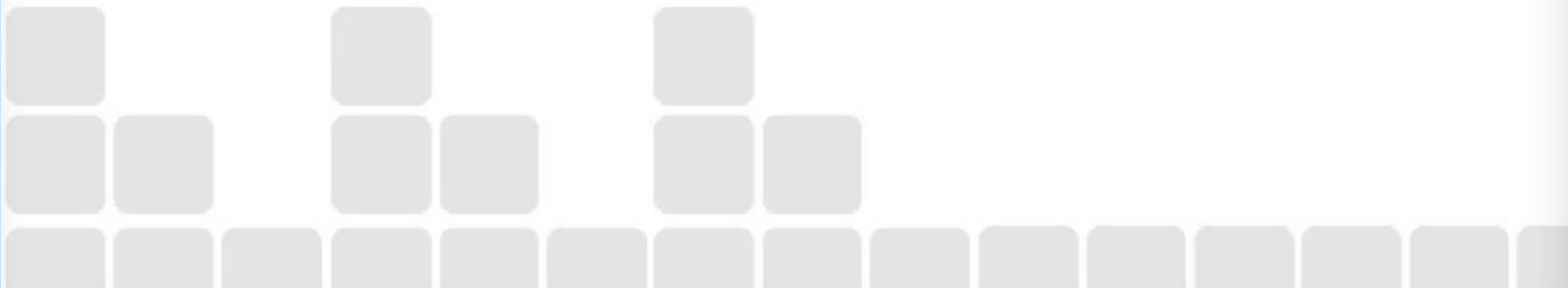
ICAAP



- Financial forecasts
- Capital available

- Risk appetite statement
- Control environment

- Pillar 1 - Minimum capital requirements
- Pillar 2A - Additional capital requirements
- Pillar 2B - Capital buffers

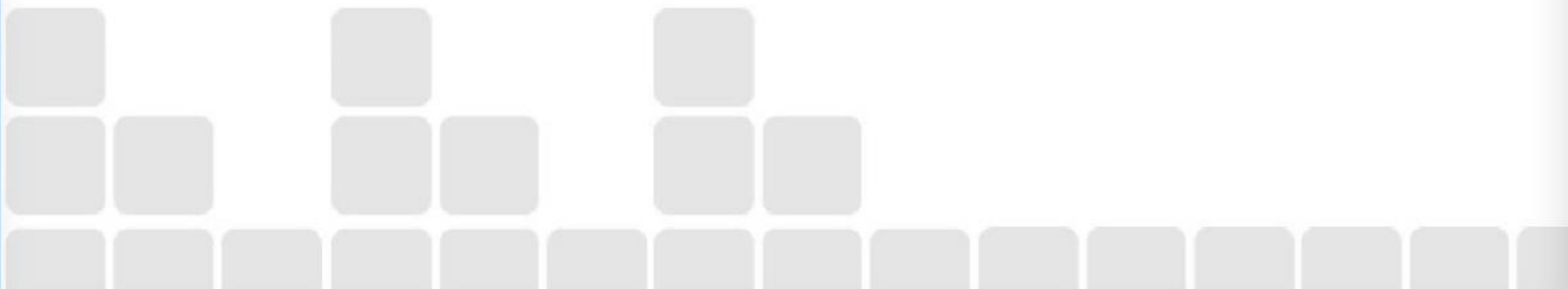


Pillar 1 – Minimum capital requirements



•Basel regulations prescribe methodologies for quantifying each of:

- Credit risk
- Market risk
- Operational risk



Pillar 1 – Minimum capital requirements



Basel regulations allow use of either:

- Standardised approach (SA)
- Internal models (subject to regulatory approval):
 - Internal ratings-based (IRB) approach for credit risk
 - Internal models approach (IMA) for market risk
- Under Basel III, the output floor will limit the extent to which banks can benefit from using their own internal models

Credit risk



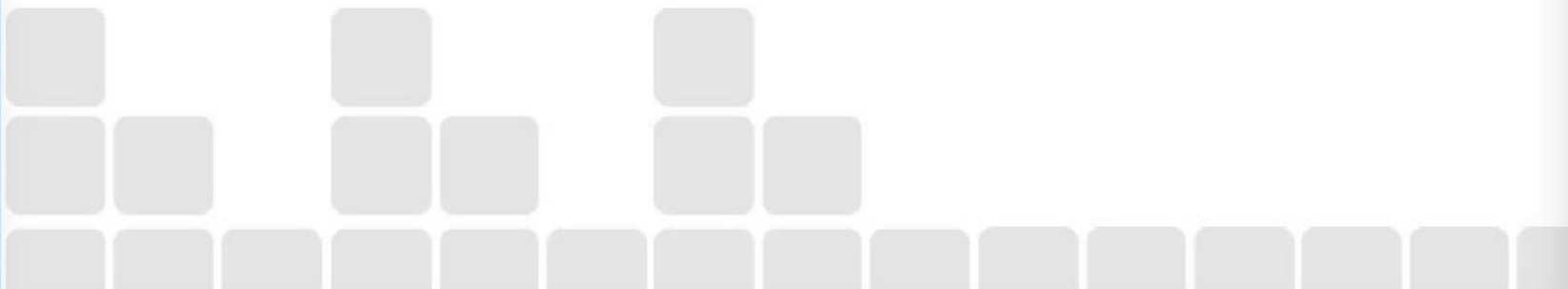
Risk weight	SA	IRB average
Mortgages		
• LTV under 50%	35%	4.5%
• LTV 70% - 80%	35%	13.9%
Credit Cards		
• UK	75%	79.6%
• International	75%	112.6%
Corporates		
• Large corporates	n/a	46.3%
• Mid corporates	n/a	71.6%
• SME	n/a	59.8%

Pillar 1 – Minimum capital requirements



Banks must quantify:

- Risk-weighted assets (RWAs) for credit risk
- Equivalent RWAs for market risk
- Equivalent RWAs for operational risk
- Total RWAs



Pillar 1 – Minimum capital requirements



Minimum capital requirements are defined as percentage of total RWAs

Capital	% total RWAs
Total	8%
Common Equity Tier 1 (CET1)	At least 4.5%
Additional Tier 1 (AT1)	Up to 1.5%
Tier 2 (T2)	Up to 2%

Pillar 2A – Additional capital requirements



Areas that may not be adequately captured under Pillar 1, if using standardised approach:

- Credit risk
- Market risk
- Operational risk

Pillar 2A – Additional capital requirements



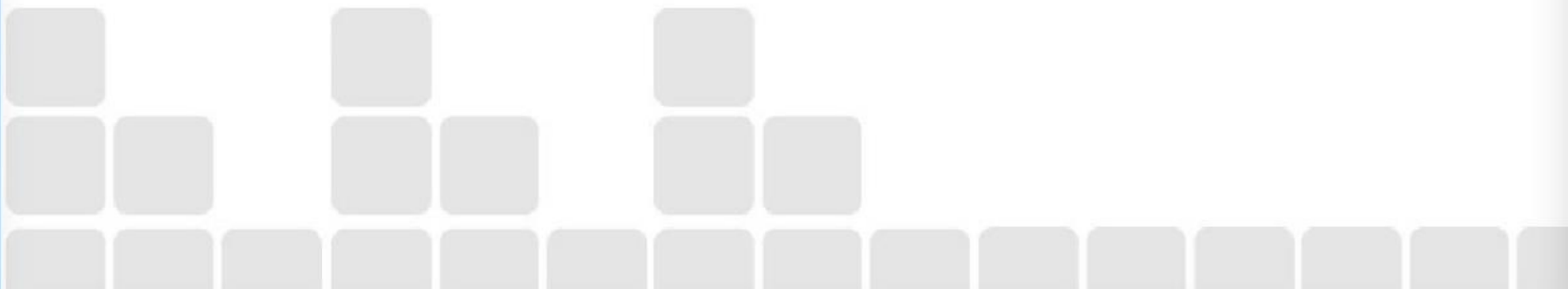
Areas that are not captured under Pillar 1:

- Credit concentration risk
- Counterparty credit risk/credit value adjustment (CVA)
- Interest rate risk in the banking book (held to maturity)
- Pension obligation risk

Total capital requirements (TCR)



- Minimum capital requirements (Pillar 1)
- Additional capital requirements (Pillar 2A)
- Total capital requirements (TCR)
- Banks must meet their TCR at all times



Pillar 2B – Capital buffers



Buffer	% total RWAs	Set by
Buffers set for all banks		
<ul style="list-style-type: none">Capital conservation buffer (CCoB)	2.5%	Basel Committee
<ul style="list-style-type: none">Countercyclical capital buffer (CCyB)	Up to 2.5%	Bank of England
Buffers set for individual banks		
<ul style="list-style-type: none">Systemic risk buffer	Up to 3.0%	Bank of England
<ul style="list-style-type: none">PRA buffer	n/a	PRA

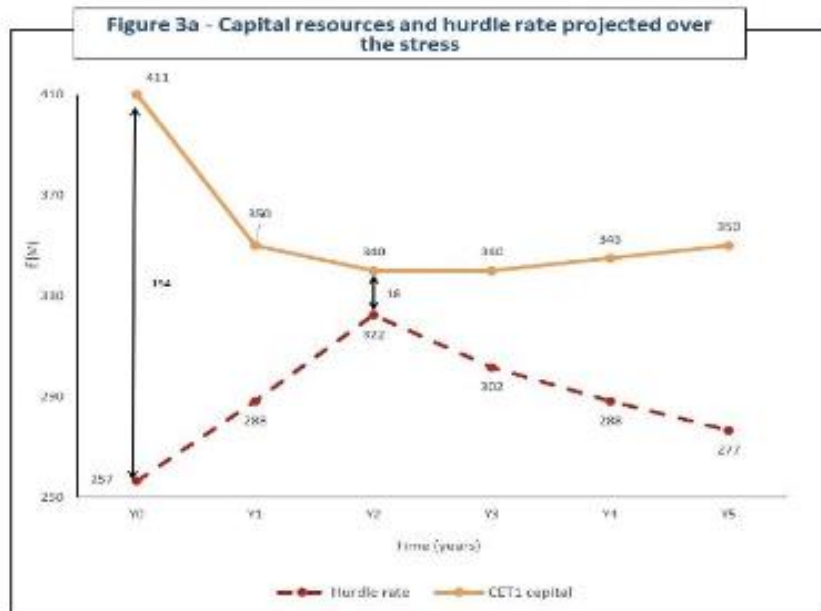
Pillar 2B – Capital buffers



Stress testing

- Stress scenarios: system-wide, bank-specific, combined
- Reverse stress test
- Management actions
- Must be realistic and achievable
- Consider stress scenarios before and after management actions
- Capital buffer
- Determined by stress testing exercise
- CET1 capital

Capital adequacy



May dip into capital buffers in period of stress
Must hold total capital requirements (hurdle rate) at all times

Pillar 2B – Capital buffers

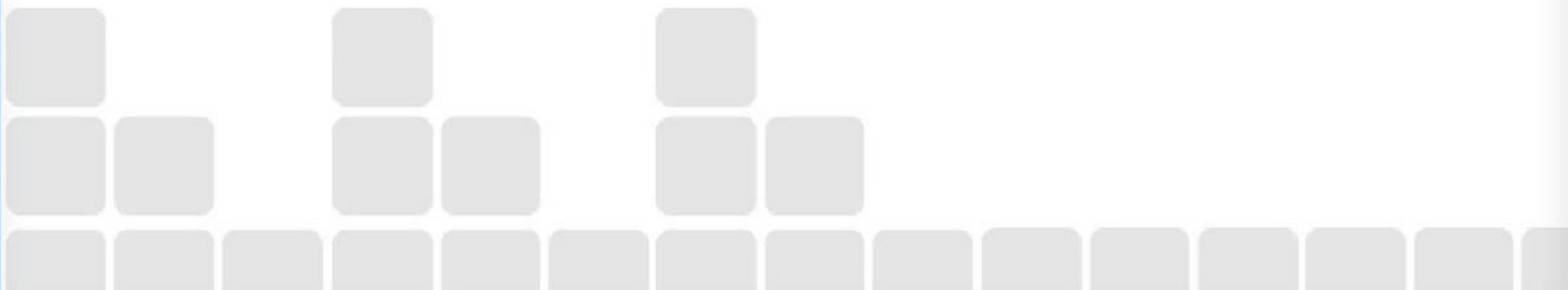


Capital buffer shall be the larger of




- Total of CCoB and CCyB (1)
- Buffer determined by stress testing exercise (2)

If (2) is greater than (1), additional buffer is amount of PRA buffer

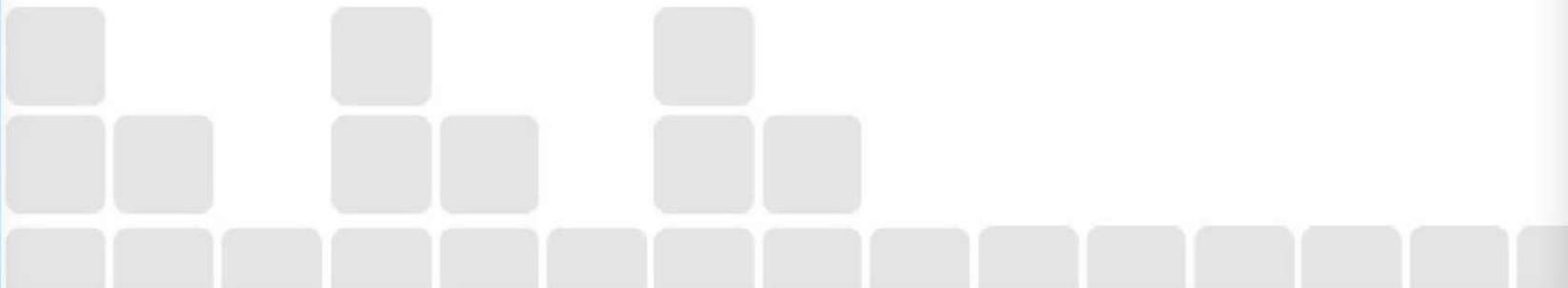
If (1) is greater than (2), PRA buffer = 0



How much capital should a bank hold?

Assessment	Requirements
Pillar 1 - Minimum capital requirements	
• Standardised approach	Comply with Basel regulations 
• Internal models	Need understanding and judgement 
Pillar 2A – Additional capital requirements	Need understanding and judgement
Pillar 2B – Capital buffers	Need understanding and judgement

Product Pricing and Profitability

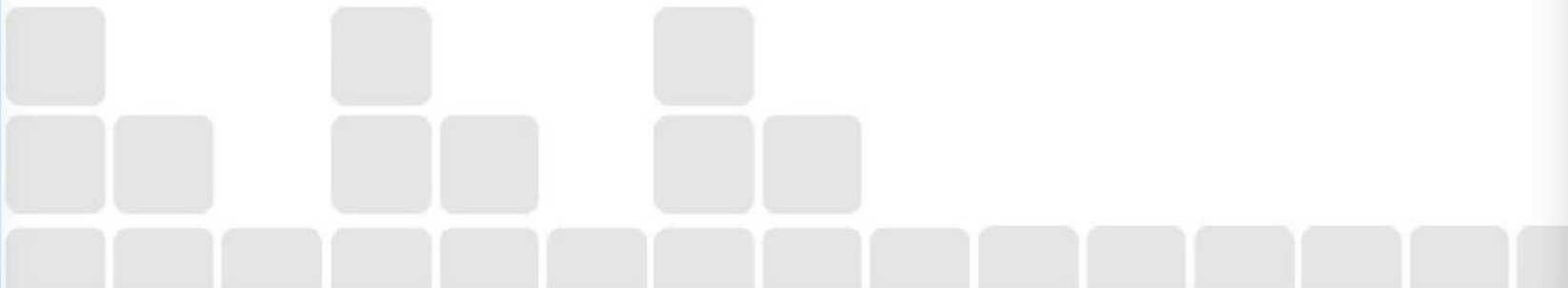


Product pricing and profitability



Retail banking products

- Current accounts
- Deposit accounts
- Credit cards
- Personal loans
- Mortgages

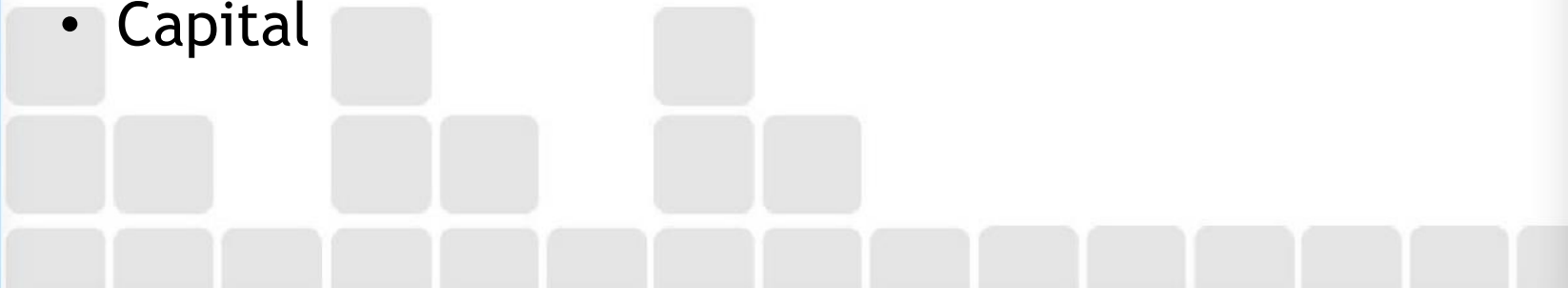


Product pricing and profitability



Cashflows for net present value (NPV) model

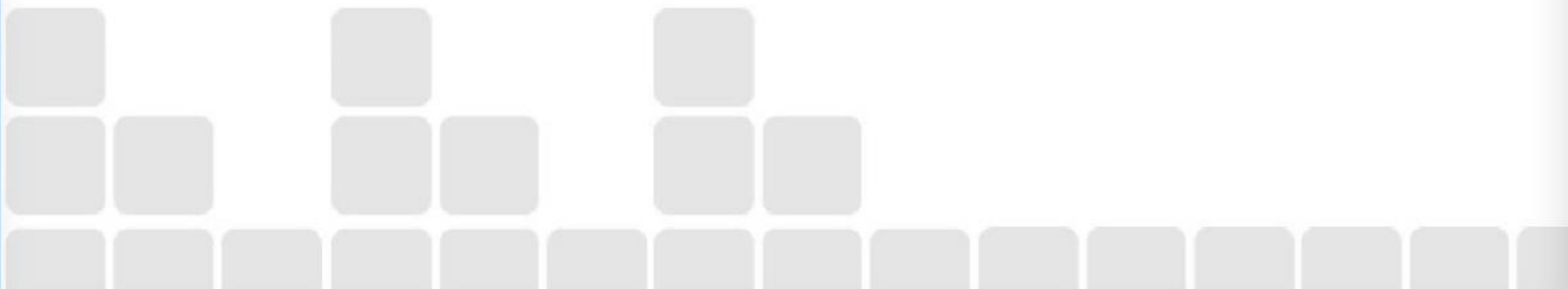
- Volumes
- Income
- Credit losses
- Costs
- Liquidity
- Capital



Volumes



- Consider cohort of loans
- Volume declines over time:
 - Withdrawals (early repayments)
 - Defaults (borrowers cannot repay loans)
- Forecast volumes over life of loans



Income



Interest income

- Often variable, but may be fixed
- May vary according to term, risk

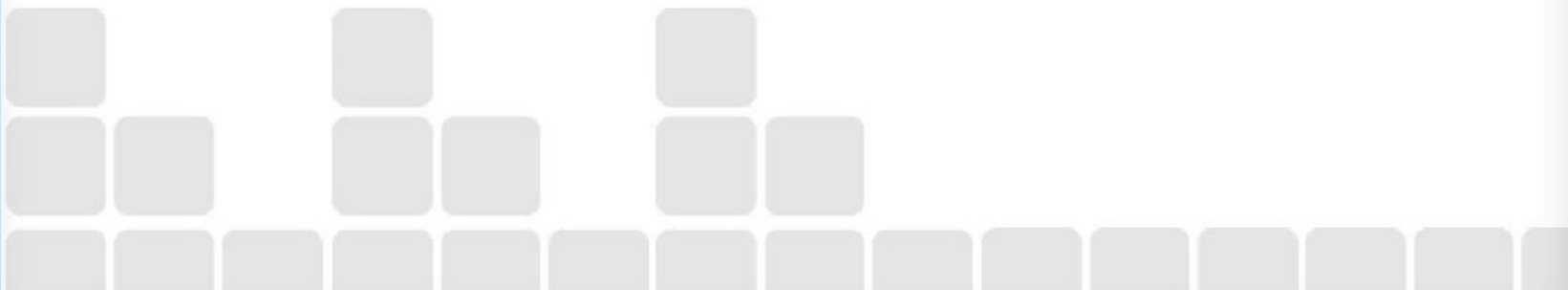
Non-interest income (fee income)

- May be initial, ongoing or final, for example:
 - Initial fees on mortgages
 - Ongoing fees for current account transactions
 - Early repayment charges on loans

Credit losses



- Losses arising from defaults (PD, LGD, EAD)
- Loss curves: typically low at first, then rising
- Provisions for expected credit losses (IFRS 9)
- Impairments in bank's profit and loss account
- Impairments reduce bank's profit, capital
- Need to forecast expected credit losses 😊



Operating costs



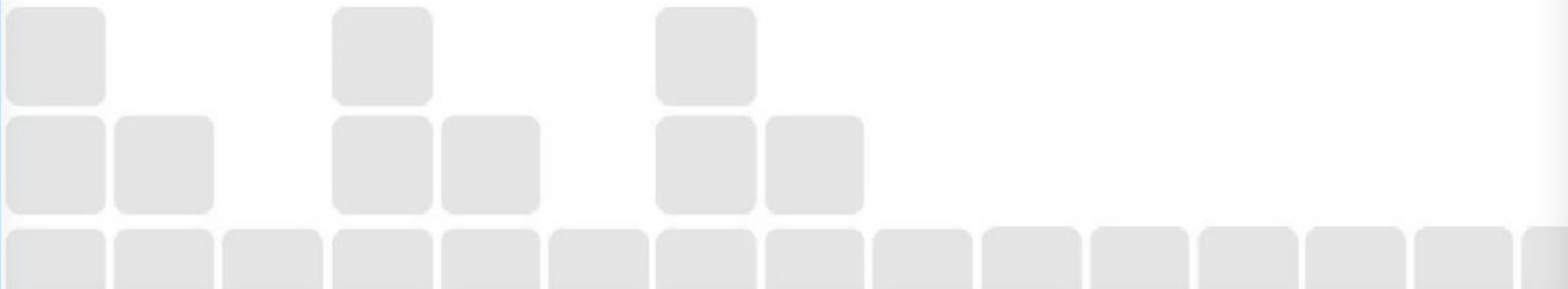
Direct costs

- May be initial, ongoing or final

Shared costs

- IT, Treasury, branches, centre functions, head office
- Need to allocate between product categories 😊

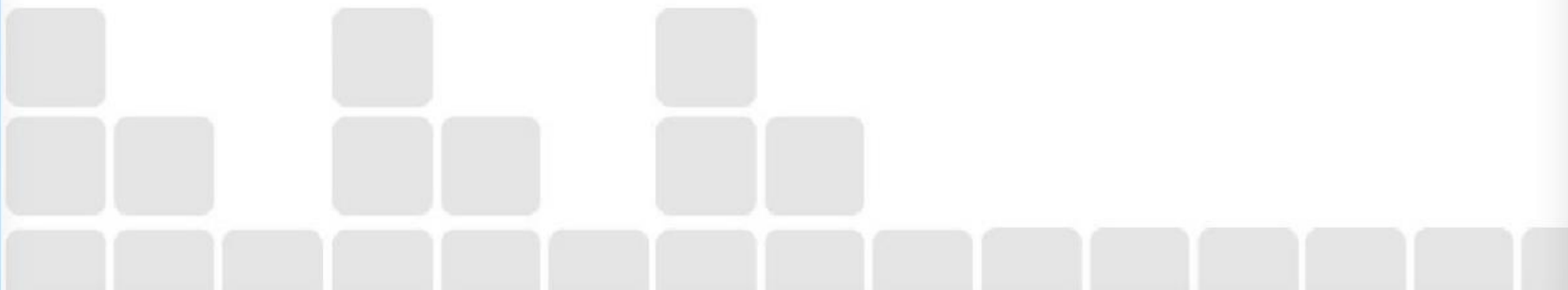
May consider marginal cost v fully-loaded costs 😊



Funding costs



- Loans typically funded by retail/wholesale deposits
- Funding costs determined by bank's Treasury
- Deposits and loans regarded as profit centres
- Funds transfer pricing: need to set rates 😊
- Term liquidity premium: need to set rates 😊



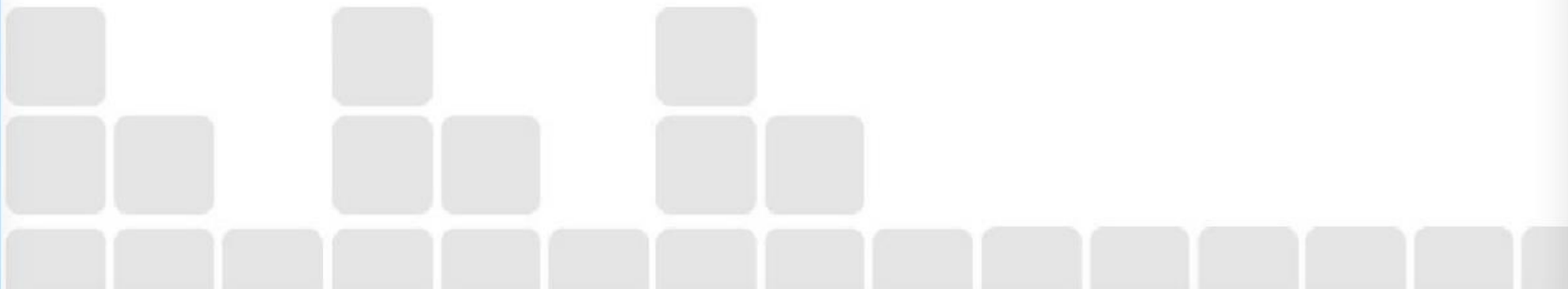
Liquidity



Banks typically 'borrow short and lend long'
e.g. 25 year mortgages funded by instant access deposits

However

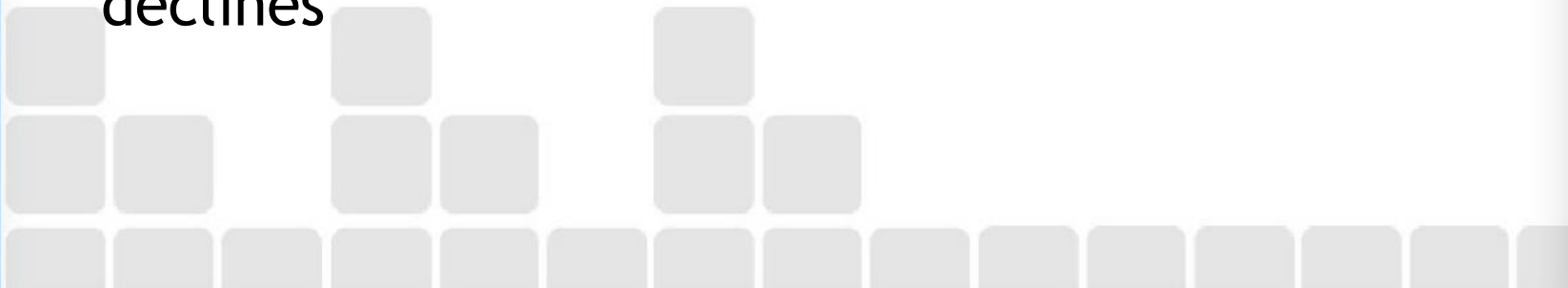
- Many mortgages are repaid before contractual maturities
 - Many instant access deposits remain for years
-
- Consider behavioural v contractual maturities 😊
 - Adjust term liquidity premium to control liquidity 😊



Capital



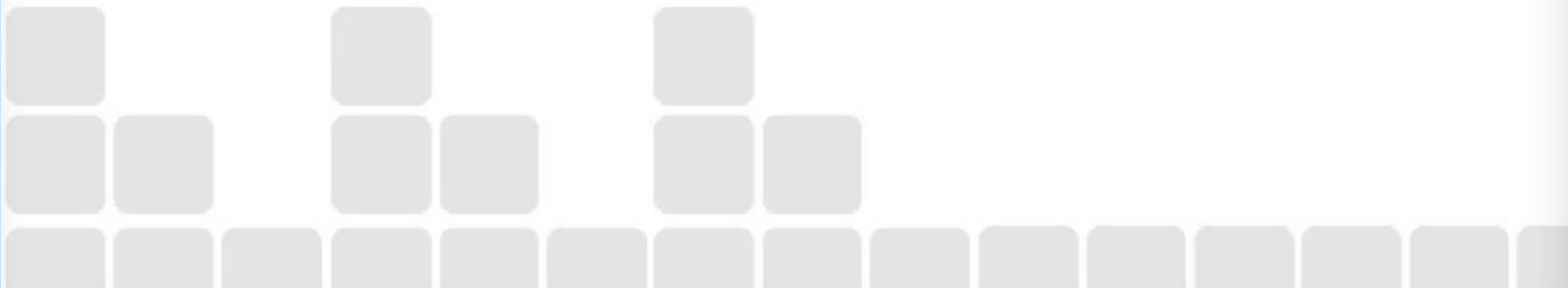
- Hold capital for unexpected losses
- (not allowed for pricing of loans)
- Amounts of capital vary by:
 - Type of loan, according to riskiness
 - Segments within cohort, according to riskiness
- Assess capital requirements for cohorts/segments 😊
- Capital outflow initially, inflows as volume declines



NPV of cohort of loans



- Cashflows
 - Net interest income
 - Credit losses
 - Operating costs
 - Capital
- NPV is discounted value of all cashflows
- (discounted at bank's cost of capital)
- If NPV is positive, cohort meets target return on capital



Risk-based pricing



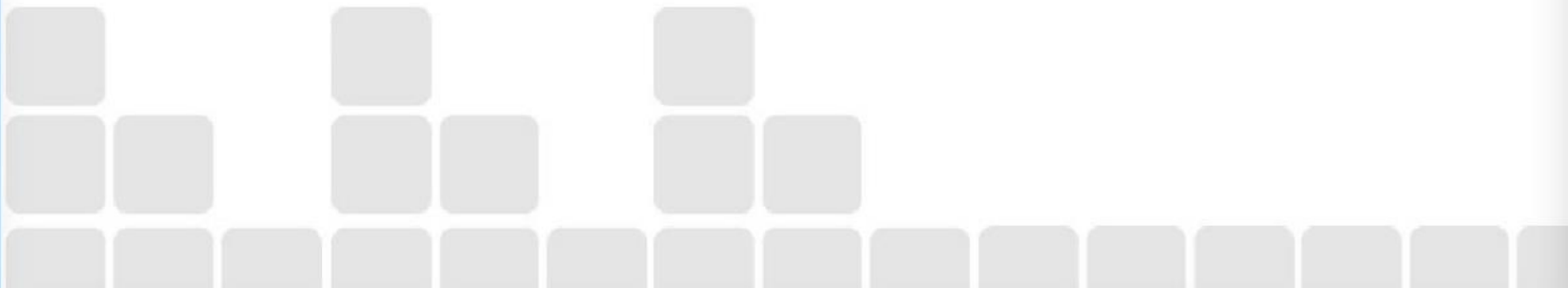
Could differentiate by

Discount rate (cost of capital)

Funds transfer pricing rate

Capital requirements (% of loans)

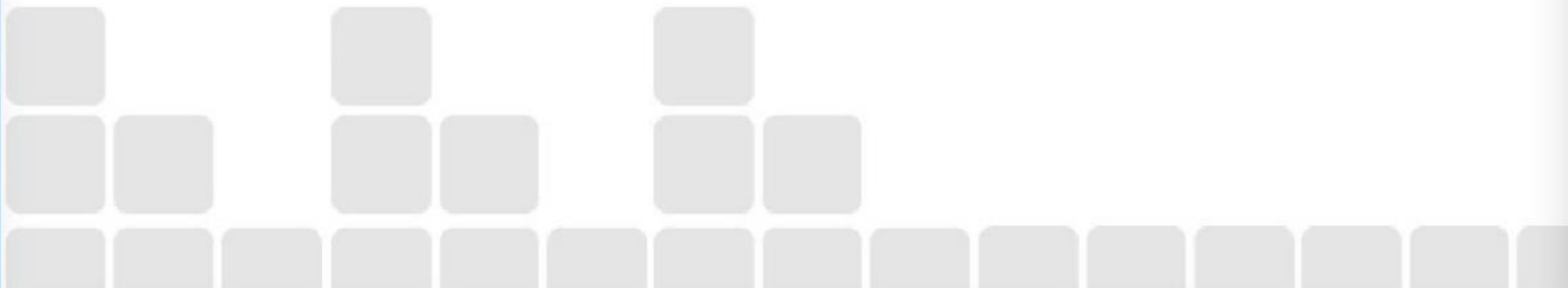
Recommend differentiation by capital requirements 😊



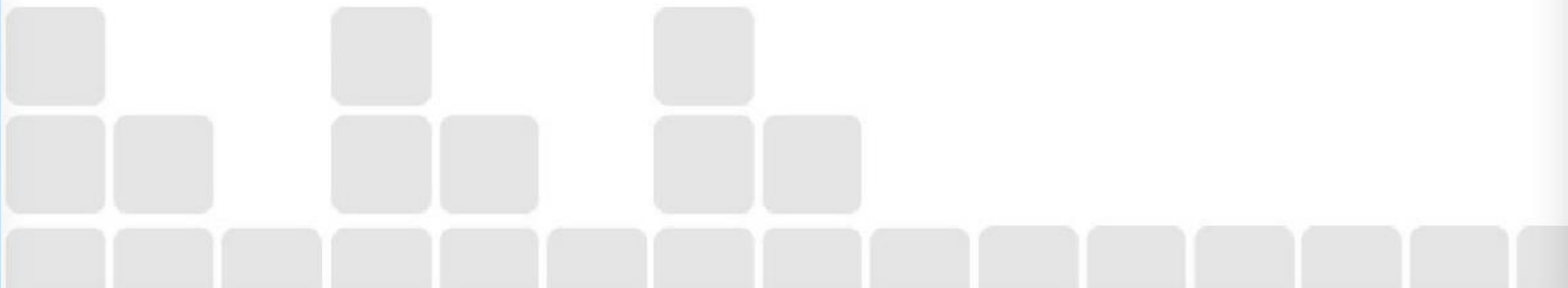
Product pricing and profitability



- Base case
- Sensitivities/stress tests
- Risk-based pricing
- Need understanding and judgment 😊



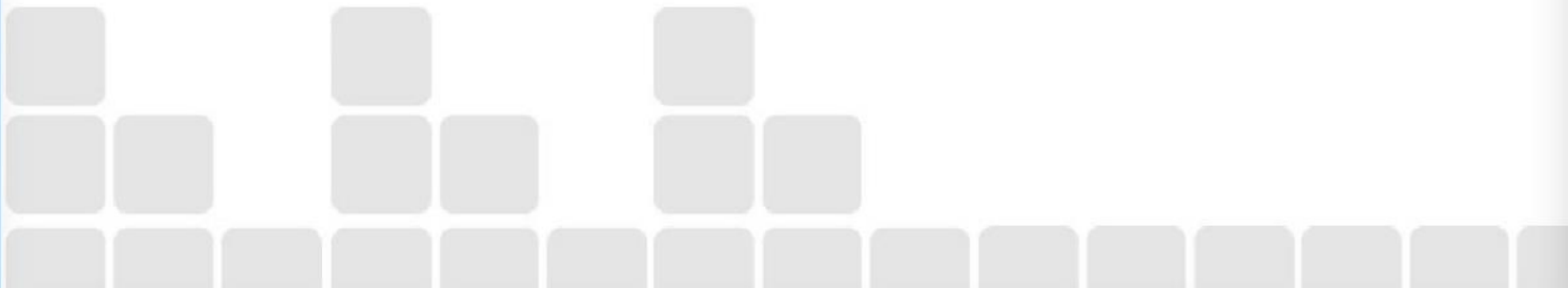
Current Issues



Banking is changing



- Basel II to Basel III
- Incurred to expected credit losses
- Climate change stress testing



Basel III final reforms



- Revised SA for credit risk 1 January 2023
- Revised IRB framework for credit risk 1 January 2023
- Revised CVA framework 1 January 2023
- Revised operational framework 1 January 2023
- Revised market risk framework 1 January 2023

- Output floor (full implementation) 1 January 2028

Basel III final reforms



Operational risk

- Must use new standardised approach
- *“Sources of such losses are hard to predict using internal losses.”* Basel Committee, December 2017

Output floor

- Banks' RWAs must be at least 72.5% of RWAs calculated by using the standardised approaches
- Transitional arrangements from 50% in 2023 to 72.5% in 2028

IFRS9 versus IAS39



IFRS9 versus IAS39, from 1 January 2018

IAS39 (incurred loss accounting):

- Make provisions in event of risk events occurring

IFRS9 (expected credit losses):

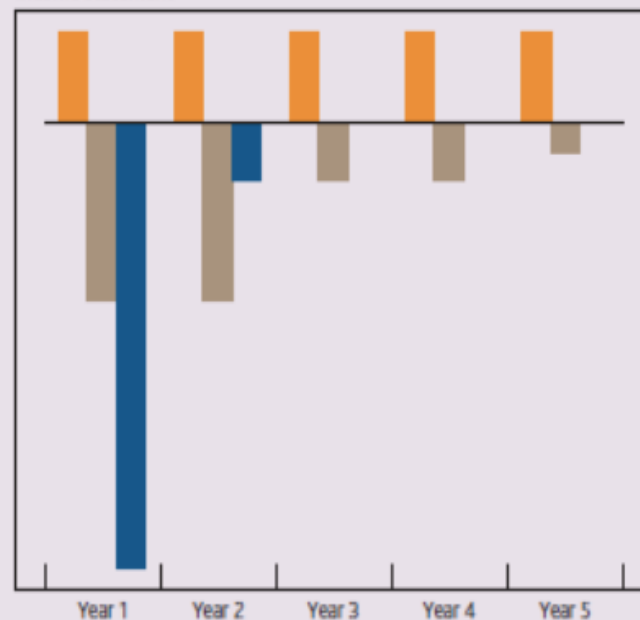
- Make provision for all loans in three stages:
 - Stage 1: Performing loans: 12 months expected losses
 - Stage 2: Underperforming loans: Lifetime expected losses
 - Stage 3: Non-performing loans: Lifetime expected losses

IFRS9 versus IAS39

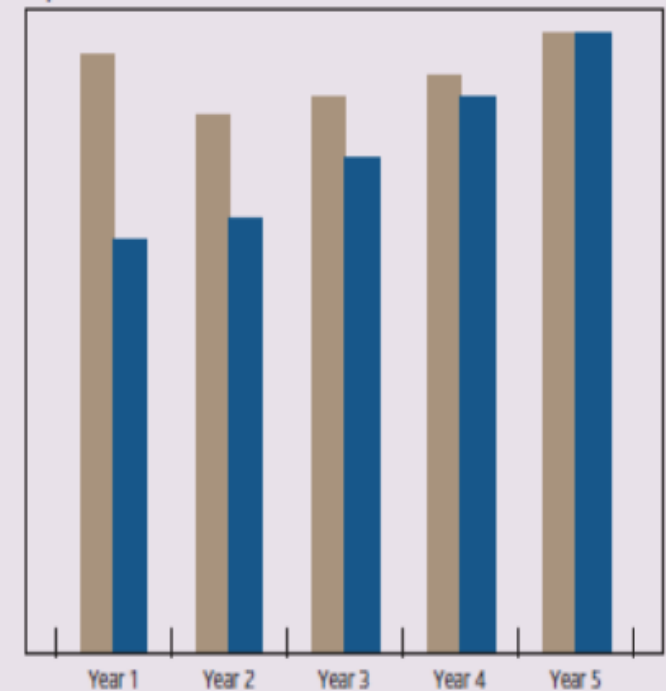
Figure 2 An illustration of the impact of IFRS 9 on a bank's capital resources during a stress scenario

Income IAS 39 losses IFRS 9 losses

Income statement



Capital resources



Source: Bank of England.

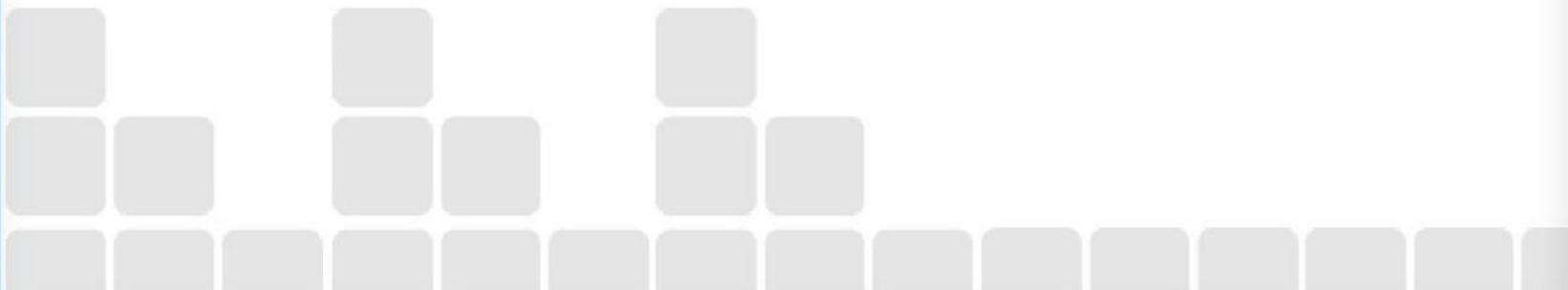
Expected credit losses



“While estimating ECL, banks should not apply the standard mechanistically and should use the flexibility inherent in IFR5S9.”

*e.g. “reflect mitigating impact of support measures”,
“give due weight to long-term economic trends”*

Basel Committee, April 2020

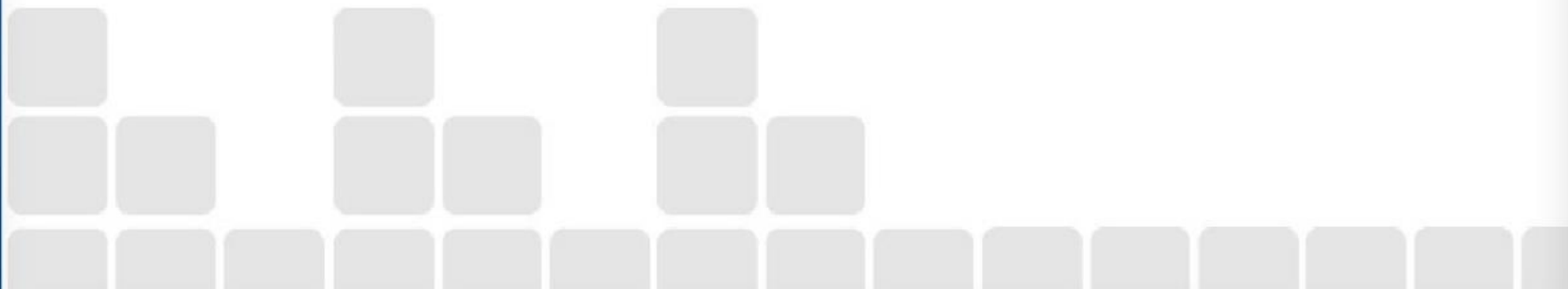


Expected credit losses



“The CRR ‘Quick Fix’ introduces new transitional arrangements for the capital impact of IFRS9 ECL provisions. For relevant provisions raised from Wednesday 1 January, the CET1 add-back percentages are set at 100% in 2020 and 2021, 75% in 2022, 50% in 2023, and 25% in 2024.”

PRA, June 2020



Climate change stress testing



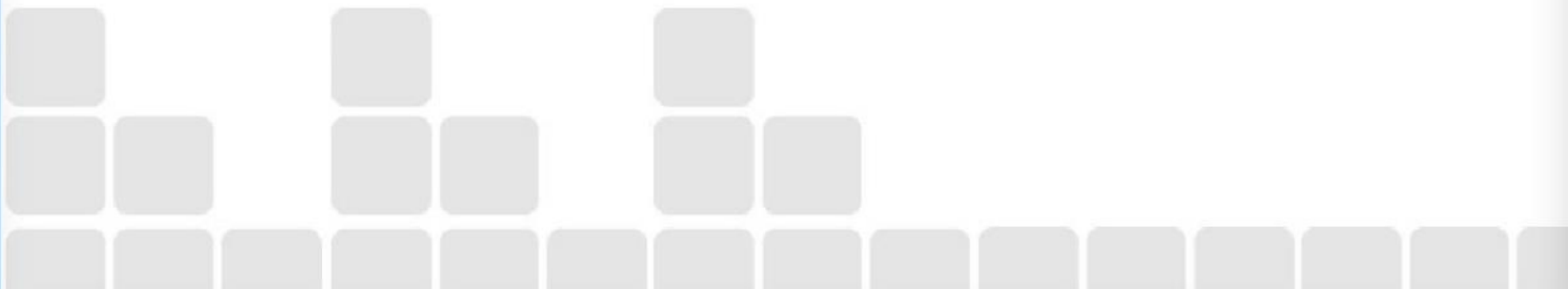
Bank of England Discussion paper, December 2019:

- Multiple scenarios: three climate scenarios
- Broader participation: UK's largest banks and insurers
- Extended modelling horizon: 30-year modelling horizon
- Integrated climate and macrofinancial variables: Bank will provide pathways and macrofinancial variables
- Counterparty-level modelling expectations: firms will assess vulnerability of individual counterparties' business models

Banking is changing



- Branches to online
- Move to cashless society
- Extracting value from databases

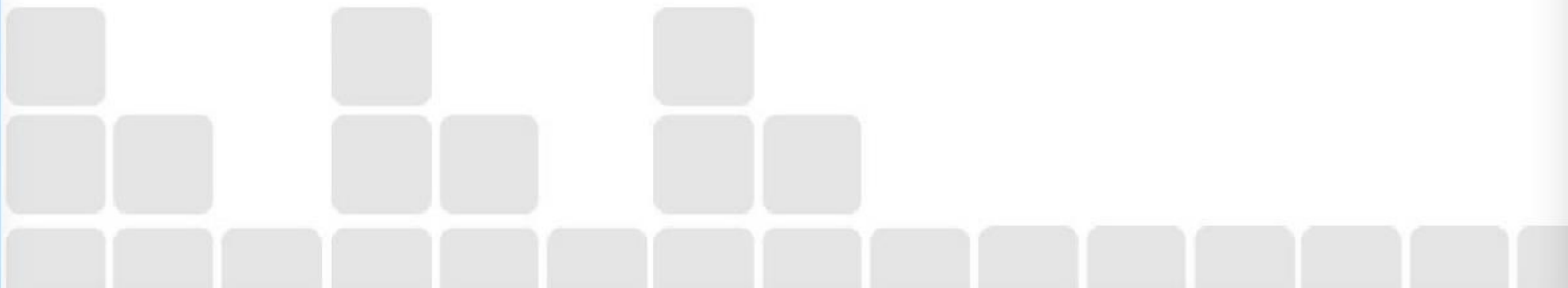


Data science in banking



- Banks have lots of data (customers, risks)
- Open Banking APIs

- Identity verification
- Fraud detection
- Credit scoring
- Personalised marketing
- Automated advice



Thank You

