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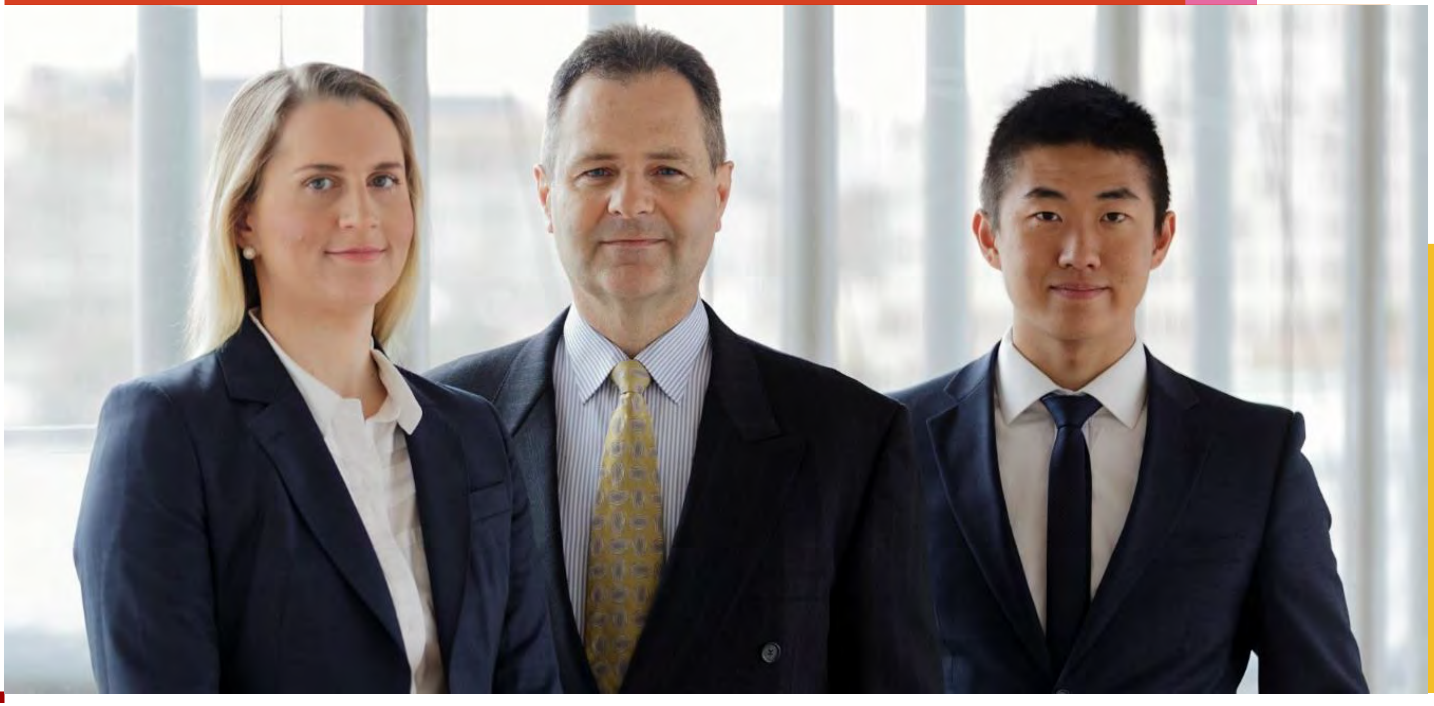
Basel III ***Reforms ('Basel IV')***
Capital Floors

December 2017



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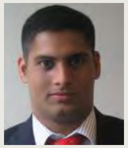

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Basel III reforms ("Basel IV")

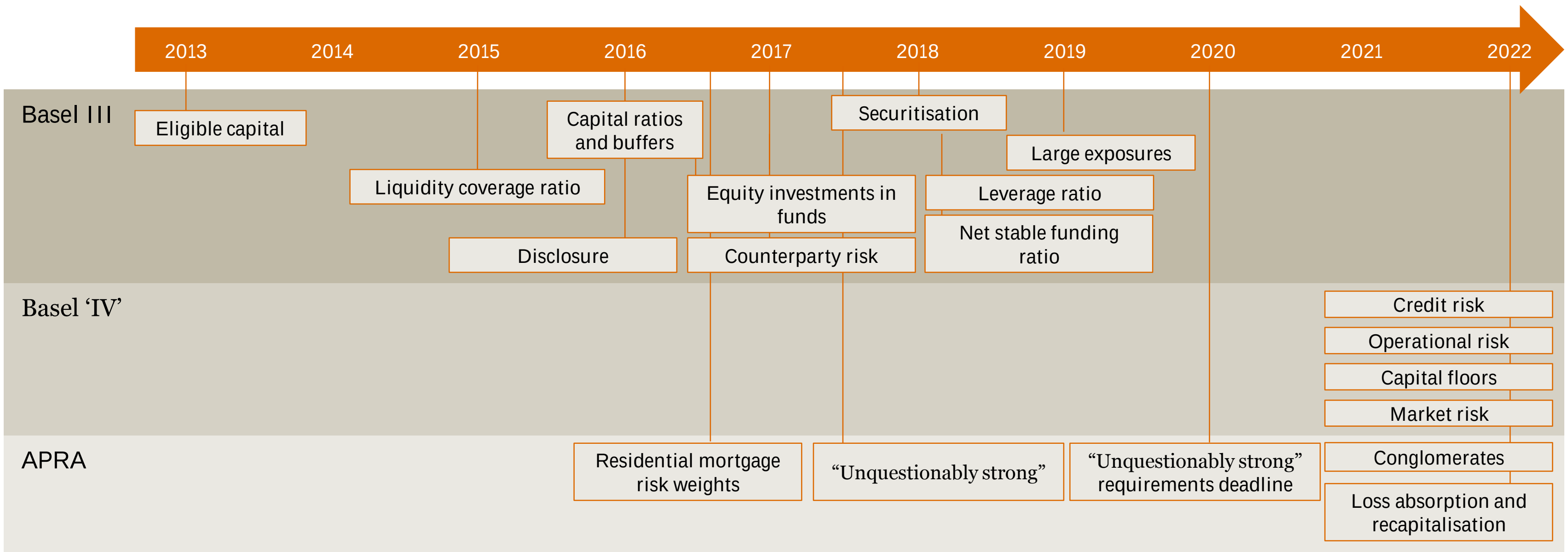
Background and Output floors

Background

- Finalisation of Basel III post-crisis reforms on 7th December 2017
- Aims to impose limits on how much the biggest banks' bespoke models for calculating risk in areas can diverge from the regulators' more conservative calculations

Output floors

- The 2017 reforms replace the existing capital floor with a more robust, risk-sensitive output floor based on the revised standardised approaches.
- Banks' calculations of RWAs generated by internal models cannot, in aggregate, fall below 72.5% of the risk-weighted assets computed by the standardised approaches.
- The changes will occur over a transitional period from 2022 - 2027



APRA’s perspective on Basel III reforms (“Basel IV”)

Consistent with its July 2017 announcement, APRA reaffirms its expectation that ADIs should be following strategies to increase their capital strength to exceed the unquestionably strong benchmarks by 1 January 2020.

- Simultaneous announcements by APRA and the BCBS underscore APRA’s involvement in finalising the reform package, which emphasises their commitment to implementing these reforms.
- The Basel Committee has agreed to an implementation timetable commencing in 2022 for the final Basel III reforms. APRA will consider the appropriate effective date for revisions to the ADI prudential standards in light of the Basel Committee’s announcement and expects to commence consultation on revisions to the ADI capital framework in early 2018.
- The 2018 consultation will be based on the final Basel III framework but with appropriate adjustments to reflect APRA’s approach and Australian conditions, most notably adjustments to capital requirements for higher risk residential mortgage lending, consistent with the achievement of unquestionably strong capital ratios.

“*Importantly for Australian ADIs, these final Basel III reforms will be accommodated within the targets APRA set in July this year in our assessment of the quantum and timing of capital increases for Australian ADIs to achieve unquestionably strong* ***capital ratios.***”

– (Wayne Byres, APRA Chairman)

APRA consultation in 2018

What was in this announcement?

- *Basel III reforms* ("Basel IV") *package*
- *Capital floors*
- *Credit Risk*
- *Operational Risk*
- *Capital optimisation*

Basel III reforms ("Basel IV")

Overview of measures taken to reduce excessive variability in RWAs

1 Capital floors

- RWA (using internal model approaches) floored by a percentage of RWA as determined through the standardised approaches.
- The capital floors will eventually be 72.5% based on the new standardised approach.
- Introduction in 2022 via a phase-in over five years

3 Market risk (finalised in 2016)

- Revised boundary of the trading book and stricter approval of internal models.
- Sensitivities-based approach as new standardised approach, which also serves as a floor for the internal model approach.
- Internal model approach with expected shortfall based on stressed calibration as key metric, and considering product-specific liquidity horizon.

4 Operational risk (OpRisk)

- Replacement of existing approaches by a new standardized approach.
- Fundamental assumption that operational risk is related to size.
- Use of the 'unadjusted business indicator' as a measure of operational risk exposure combined with collection and analysis of historical loss data.

2 Credit risk

- Revised standardised approach including broadly revised risk weights and additional due diligence requirements.
- Constraints on the use of internal models (for some credit portfolios) and introduction of parameter input floors for the IRB approach.
- Ban on use of internal models-based approach and introduction of a standardised approach for CVA.
- New rules for securitisation RWA and simple, transparent and comparable (STC) securitisations (already finalised in 2016).
- New standardised approach for the calculation of EAD for derivative exposures (already finalised in 2016).

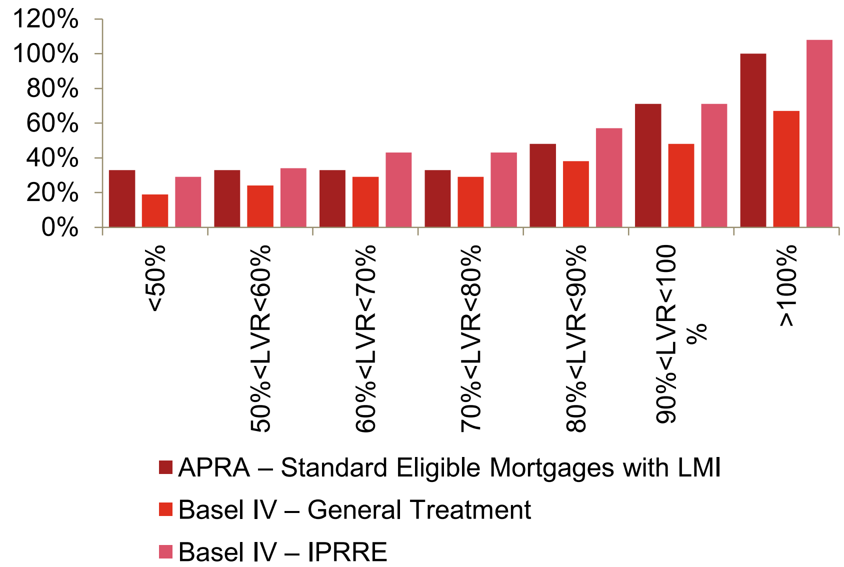
5 Other topics

- Global standard for large exposures with harmonised definition on exposures and groups of connected clients.
- Standardised disclosure templates and new disclosure requirement for all new RWA approaches.
- Pillar II and indirect Pillar I requirements on step-in risk.
- Phase-in of 'old' Basel III rules.
- Leverage ratio buffer for global systemically important banks.
- Discussion paper on sovereign risk.

Australian Residential Mortgage impact

Key Impacts

- The 5% point reduction in standardised risk weights for residential mortgages provides a more favourable outcome for mortgage heavy Australian banks.
- On our estimates, based on a typical portfolio mix by LVR, the standalone capital floor for residential mortgages is just below the current average RW of 25% for the Majors.
- As the LVR must be calculated using the property value at origination, there is an incentive for market churn ahead of the reform timetable.
- The **two "wild** cards" are the portion of mortgages deemed to be Income Producing Residential Real Estate (IPRRE) and accounts that do not satisfy the operational requirements.
- Shown in the graph are the comparative risk weights by LVR band, showing the sharp increase for IPRE loans.



Income Producing Real Estate

- Repayments materially dependent on cash flows generated by property

Operational Requirements

- Finished property
- Legal enforceability
- Claims over the property
- Ability of the borrower to repay
- Prudent value of property
- Required documentation

Usage of internal models – Credit Risk

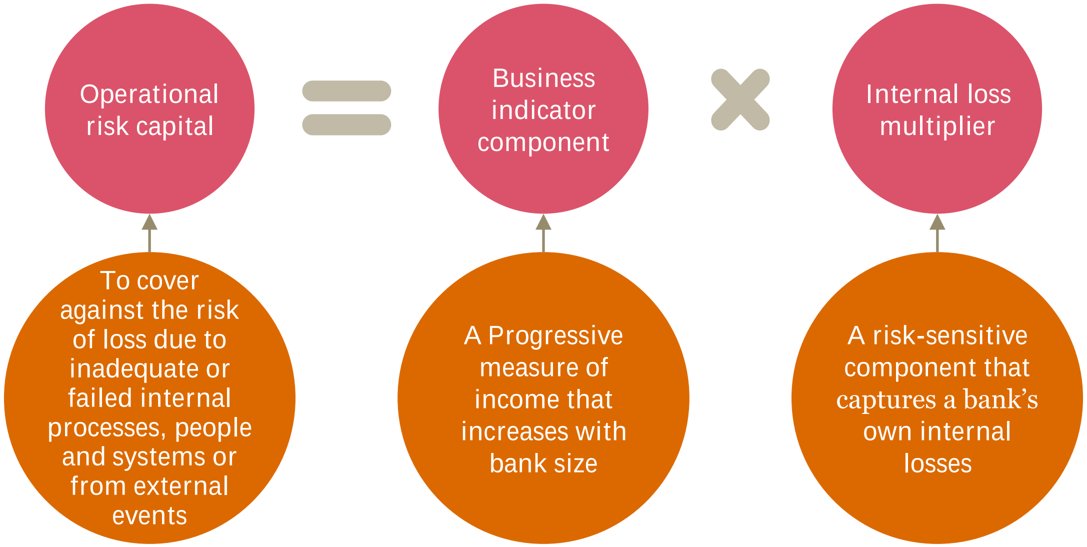
The internal ratings-based (IRB) approach for credit risk allows banks, under certain conditions, to use their internal models to estimate credit risk, and therefore RWAs. The 2017 reforms introduced some constraints to banks' estimates of risk parameters. There are two main IRB approaches: Foundation IRB (F-IRB) and Advanced IRB (A-IRB).

Exposure Class	*Methods available under new credit risk standards (Jan 2022)*	*Change in available methods relative to current credit risk standard*
Banks and other financial institutions	SA or F-IRB	A-IRB removed
Corporates belonging to groups with total consolidated revenues exceeding EUR 500m (AUD 772m)	SA or F-IRB	A-IRB removed
Other corporates	SA, F-IRB or A-IRB	No Change
Specialised lending	SA, supervisory slotting, F-IRB or A-IRB	No Change
Retail	SA or A-IRB	No Change
Equity	SA	All IRB approaches removed

Streamlined Operational Risk

- Single standardised approach, which is more risk-sensitive. Operational Risk Capital (ORC) is calculated by combining a refined measure of gross income with a bank's own internal loss history over 10 years.
- Possibly greater increase in ORC for Australian banks than originally anticipated, due to recent fines (e.g. Anti-money laundering, bank conduct in retail and financial markets) and the Banking Royal Commission in 2018.
- Effort required to improve Internal Loss Data (ILD) per minimum data quality standards. The quality of data will also impact the Internal Loss Multiplier (scaling factor).

The new standardised approach

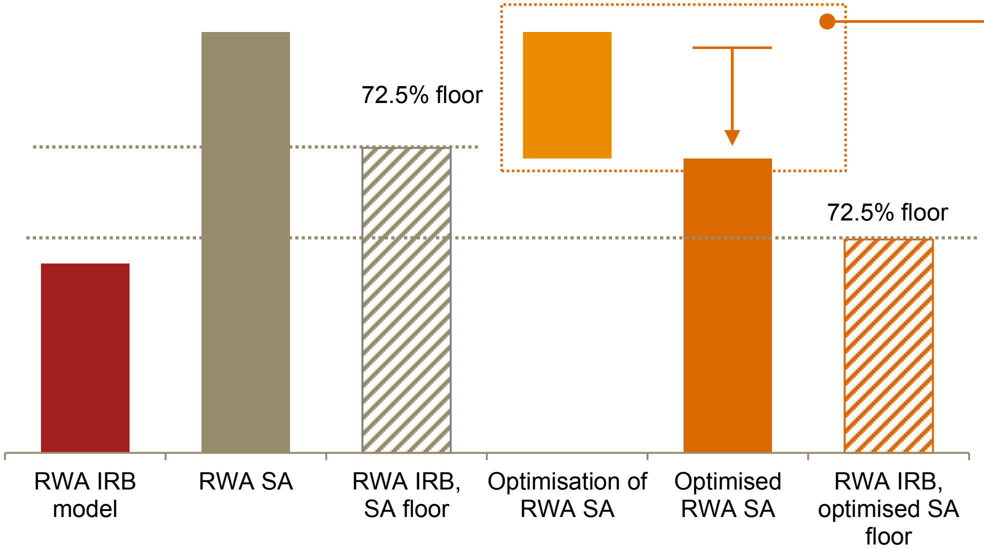


Standardised approaches

The future key to RWA optimisation

Capital floors limit the RWA reduction that can be achieved using internal models (IRB, IMA, IMM) to a specified percentage of RWA calculated using standardised approaches. This forces banks using internal model to implement the standardised approaches in the most optimised way.

Effect of optimised implementation of standardised approach



Effect of standardised approach optimisation on RWA may vary for different portfolios:

What can we do ….

The implementation of the next generation of RWA creates a remarkable challenge for the banking sector

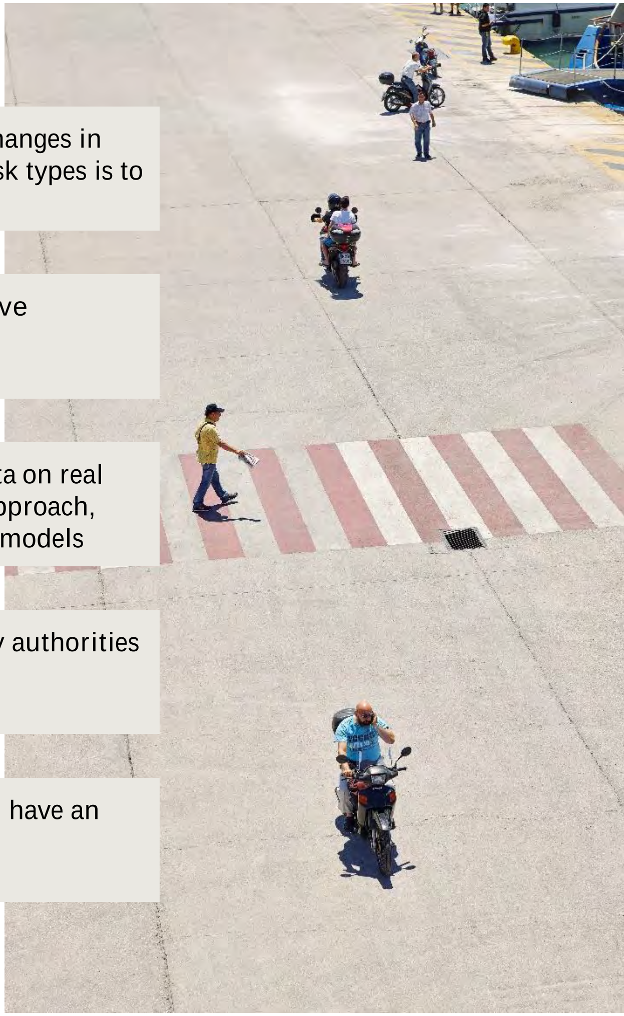
01 Business models, risk and business strategy have to be adjusted. Changes in almost all approaches to RWA calculation. A general increase in RWA in all risk types is to be expected.

02 The complexity of the new standardised approaches increases; Extensive implementation efforts exceeding Basel III are required.

03 The new approaches require extensive data requirements, eg detailed data on real estate collateral in the lending business for the new credit risk standardised approach, market data granularity and historical data for the use of internal market risk models

04 A massive expansion of the reporting requirements to the supervisory authorities is to be expected, eg monthly rather than quarterly reporting of market risk.

05 A completely new generation of data and reporting tool, software will have an impact on the future IT infrastructure.

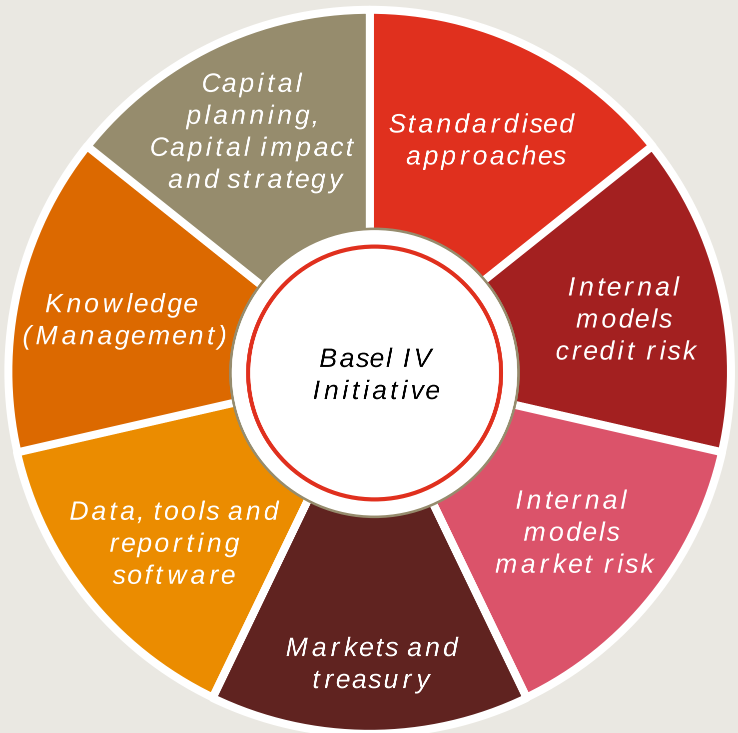


PwC have a global and local approach

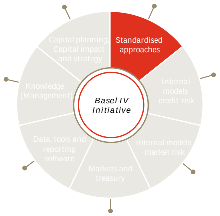
One Basel IV, but tailored solutions for each country

Basel IV Leader: Martin Neisen

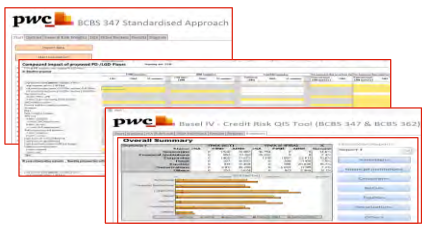
Australian Leader: Katherine Martin



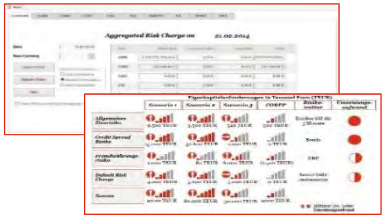
Our proven standardised approach calculation tools



Credit risk calculator

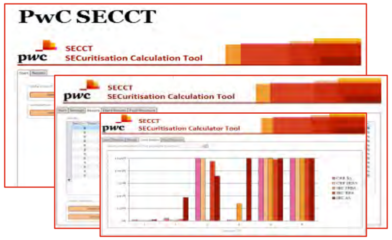


FRTB (SBA) tool

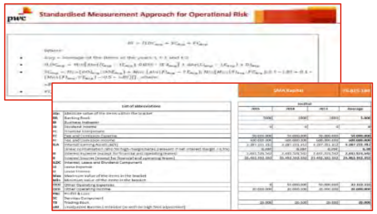


SA-CCR tool

SECCT securitisation tool



OpRisk (SMA) tool



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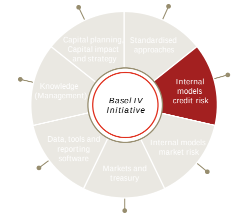
Internal Models – Credit Risk

Pressure from different directions



Initiatives

Reduction of variability in capital requirements

BCBS 362

- Reduction of complexity of the regulatory framework and improvement of comparability
- Elimination of discretions in the IRB approach used for particular risk positions

Future of IRBA

- Actions to improve the comparability of IRB models, i.e. models application, definition and treatment of defaults, credit risk mitigation techniques, calibration and validation of risk parameters

Other initiatives from EBA, ECB and IFRS

- Data quality requirements
- IFRS 9 standard for impairment calculation
- New requirements for risk parameters estimation

Challenges for clients

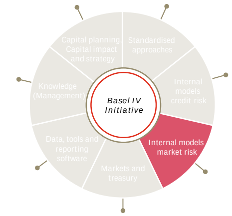
- Increased RWAs and capital requirements
- Increased resources for IRB model maintenance and validation
- Changes in portfolio composition. High impact on RWAs is expected for large corporates, specialised lending and retail mortgages portfolios
- Changes in current product structure, development of new products
- Changes in pricing models due to higher costs of risks and capital
- Adjustments of operational processes due to increased reporting requirements
- Changes in business models of banks that influence non-banking financial institutions

Solutions

- Perform impact analysis using automated PwC CRC Tool
- Identify and implement short-term measures
- Develop implementation plan for required long-term adjustments
- Develop and implement new frameworks (data quality, downturn adjustments, margin of conservatism)
- Support and preparation for on-site TRIM inspections
- Develop new/adjust existing models to reflect Basel IV new requirements
- RWAs optimisation and capital planning

Internal Model – Market Risk

More complexity and additional requirements

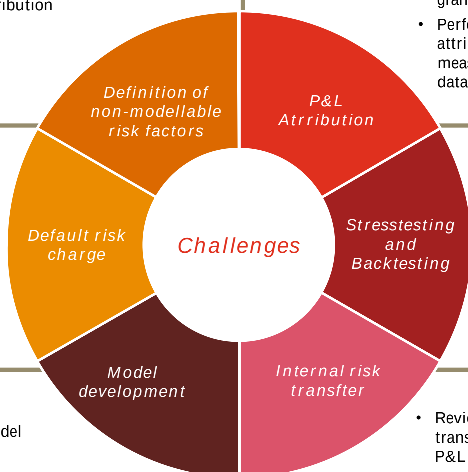


The revised internal model approach of the Basel committee to measure market risks

Key challenges

- Analyse the current valuation and pricing risk factor time-series to identify NMRFs
- Evaluate the use of modellable proxies and the materiality of remaining basis risk
- Articulate risk factor definitions in terms of NMRF capital impact, as well as P&L attribution test outcomes and backtesting results.

- Perform analysis of risk factor definitions, hierarchy and granularity used for P&L attribution
- Identify trading desks with high level of unexplained P&L due to insufficient granularity of risk factors
- Perform current state analysis of P&L attribution processes, market risk measurement processes/models and data infrastructure.



- Assess gaps between implementation of Basel 2.5 IRC to IMA DRC to determine potential modifications required (eg stochastic recovery model).
- Evaluate internal capabilities for calculation of IMA DRC for both credit and equities

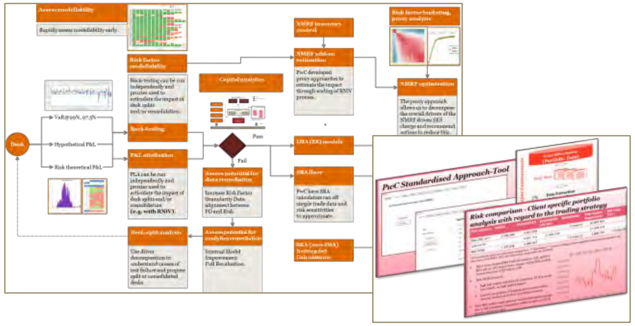
- Propose methodologies to render VaR estimates more reactive to bursts of mark volas so as to potentially reduce the number of exceptions
- Design procedures to trace exceptions due to data issues, especially for NMRF, and detect possible exception dependencies between desks.

- Model development to an ES approach
- Manage the increased dynamic of the model due to the acceptance of hedging & diversification effects
- More high-quality data and stronger analysis needed to meet new risk measurement and reporting requirements
- New & extended processes in risk control
- Increased complexity with regard to related topics like the interdependent management of economic vs regulatory CV with the IMA optimization.

- Review IMA criteria for internal risk transfer desks on a standalone basis (eg, P&L attribution and backtesting)
- Design dedicated internal risk transfer desks by product and risk factor.
- Align trading desks (books) and banking desks (books) to respective trading and banking hedging desks (books)
- Evaluate the cost benefit effect of 1) shifting from central to individual desk managed hedging; and 2) establishing hedge recognition and model approach alignment.

PwC approach

PwC provides an Internal Model Risk Optimisation Approach – one step ahead to pure model implementation

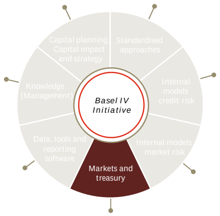


The IM Risk Optimisation Approach offers the reassessment and optimisation of business models taking into account:

- Fine-tuning of the ES model, data quality and desk organisation
- Analysing capital impact driven by different factors for each trading strategy
- Identification of adjustments in the FO pricing policy, repositioning on the market
- Comparing limited business potential with expected costs

Markets & Treasury

Challenges beyond banks and their processes



Requirements

- A 're-shape' of banks' trading activities and portfolio-structures
- Basel IV effects should be visible in real time as a basis for trading decisions to execute in front office systems
- Re-designing processes and systems, particularly in front and mid-office.

Treasury activities $

- Treasury activities may transfer to be trading activities with the effect that small banks might become unwillingly trading book-institutions
- It is estimated that more than 20% in market shares in both CIB and Business Banking shall change hands before the next 2-5 years.

New models

- Basel IV, including FRTB, revisions to estimation practices will lead to significant increases in credit and market risk capital charges
- Banks have to consider new pricing models.

Other financials

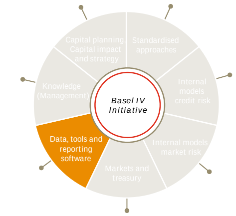
- Not only banks, but certainly also institutional investors, such as insurance companies, and asset managers are affected by Basel IV
- All banks with significant trading divisions shall be forced to re-examine their business models
- Banks repositioning will lead to opportunities for Institutional Investors and hedge funds in the financial markets.

PwC's services:

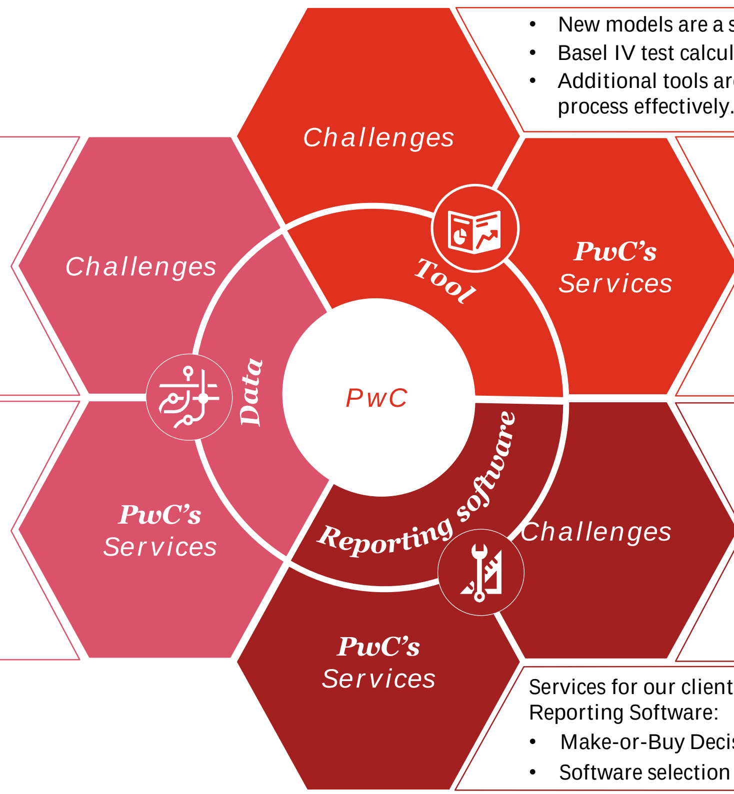
- Providing support to redesign and implement processes, systems and governance, including front-, mid- and back-office
- Providing support in understanding the impact on pricing and heavily impacted products and asset classes
- Advising institutional investors to grasp the technicalities of the regulation changes, understanding how it is effecting the markets, products, and asset classes

Data, tools and reporting software

Time to change RegReporting IT architecture



The new requirements from Basel IV lead to new challenges regarding data, IT and architecture. We have developed new services in order to solve these problems together with our customers.



- Higher requirements on availability, evaluability, quality and flexibility of data (cf. BCBS 239)
- Data Management and Data Governance must be in place
- The trend towards more granular reporting requirements in a higher frequency challenges banks.

- Projects in the area of data integration, quality and governance following our Data Excellence Framework
- Integration of Finance, Risk and Regulatory Data
- Development of Regulatory Analytics': Data Analytics on the basis of regulatory information.

- New models are a significant challenge for banks and their IT
- Basel IV test calculations need to be done quickly and reliable
- Additional tools are needed to handle the regulatory reporting process effectively.

- Sizeable platform independent calculation tools for all Basel IV and current approaches
- Development of regulatory reporting tools and add-ons for productive use, eg PwC ART
- Implementation of individual or standardised calculation engines and integration in existing IT architecture.

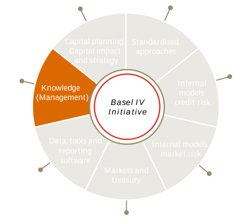
- Higher functional requirements need modern regulatory reporting systems
- These systems must be highly integrated in the banks Finance and Risk Architecture
- The aim must be to use this integration and the use of standard software to save costs and being faster in the implementation of regulatory changes.

Services for our clients to support them in the area of Reporting Software:

- Make-or-Buy Decision
- Software selection
- Implementation of standard software
- Regulatory Reporting Architecture.

Knowledge management

Cutting through the regulatory jungle



New regulatory requirements are much more complex than before, enormous challenges arise in regard to technical abilities, which will be needed to fulfill the new requirements.	Supporting clients by informing and advising them in regard to complex regulatory reforms.	• Basel IV Book globally published via Wiley finance • Basel IV Poster • Product flyers
The new Basel IV framework aims to move towards an alignment between different risk requirements. Therefore knowledge of the overall requirements will be needed.	Customised regulatory training curriculum with focus on the new Basel IV proposals.	• 3-day client Basel IV Academy • E-learning • Tailored training for client needs
Regulatory requirements are changed fundamentally within short time intervals. It is challenging for banks to be informed about all relevant reforms at an early stage.	Combine functional knowhow as well as our expertise with online Market updates	• Australian Webpage and Webinars • Basel IV Youtube Channel • Webpage • Regulatory Roadshows

https://www.pwc.com.au/basel-iv.html

Thank you for joining the Basel IV Webinar!