

Opportunities for Actuaries in Banking

Presented to
Actuaries Institute Insights Event
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Today's agenda

☼ Overview

- Context
- Banking Practice Committee (BPC)
- Actuaries Institute strategic plan 2015-17
- Actuarial Society of South Africa (ASSA)

☼ Specific areas of opportunity

- IFRS 9 (Impairment Modelling)
- Deposit Modelling (Liquidity Risk)
- Integrated Risk Management: Financial Conglomerate

Context: establishing the Banking Practice Committee (BPC)

- ⚙ Working within the Banking sector since 2003: Credit & Operational Risk
- ⚙ Area's where a Professional body could add value
 - Low default portfolios & recovery rate modelling
 - Transfer & Convertibility (T&C)
 - Integration of Operational Risk measurement models
- ⚙ Why continue membership?
- ⚙ Fortuitous timing & meeting with the then CEO (Actuaries Institute)
- ⚙ Initial stages of ASSA course design
- ⚙ Establishment of the Banking Practice Committee (BPC) in 2013

BPC: scope & objective

- ⚙ **Contributes to the strategic direction of the Institute;**
 - ⚙ **Actively supports the development of actuarial practice through the Institute's education, CPD, standard-setting, public policy and research activities; and**
 - ⚙ **Actively identifies and promotes opportunities for members working in banking and facilitates communication and liaison within the profession**
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- ⚙ Identifying new and emerging technical and practice needs of members
 - ⚙ Identifying risk exposures for the profession in banking and making recommendations to Council on how to manage these.
 - ⚙ Maintaining and developing professional education materials, including reviewing the course syllabus
 - ⚙ Identifying continuing professional development needs of members and developing CPD programs and opportunities
 - ⚙ Identifying potential issues for research and development
 - ⚙ Reviewing and developing relevant Professional Standards and Practice Guidelines
 - ⚙ Preparing public policy submissions on technical issues affecting banking and on matters of broader public interest, including research activity
 - ⚙ Communicating on a regular basis with members (e.g. via e-newsletters and [Actuaries magazine](#) articles) on issues and developments affecting banking
 - ⚙ Developing links with other actuarial bodies (overseas) and relevant professional and industry bodies
 - ⚙ Reviewing existing and identifying new Policy Statements for Council's 'Statements of Policy and Procedures'

Actuaries Institute strategic plan 2015-17

- ☀ **Goal 1:** Best practice education & lifelong learning
 - ☀ **Goal 2:** Improved member & student engagement
 - ☀ **Goal 3:** More influence & better known
 - ☀ **Goal 4:** Reach in Asia
 - ☀ **Goal 5:** Extend practice reach
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- ☀ Revisions tabled for Parts I & II – inclusion of ‘data & systems’
 - ☀ “Goal 5 also promotes Goals 1, 2 and 4 by: **establishing Banking Part III and data analytics CPD** courses to support lifelong learning”
 - ☀ Actuaries Institute currently establishing criteria for ‘success’ of Part III subject

ASSA: Banking Fellowship subject

- ⚙ Worked closely with ASSA since 2013
- ⚙ Assisted in broaden scope & reviewing course materials
- ⚙ Syllabus comprises of 14 core modules
 - **Module 1:** Bank structures and business models - Banking institutions in the global and South African economy
 - **Module 2:** Regulatory and Governance Framework in South Africa
 - **Module 3:** The Risk Management Universe for Banks
 - **Module 4 & 5:** Managing and understanding credit risk part I & II
 - **Module 6:** Understanding and managing market and interest rate risks
 - **Module 7:** Understanding and managing operational risk

ASSA: Banking Fellowship subject (cont.)

- ⚙ Syllabus (cont.)
 - **Module 8-10:** Liquidity risk management Parts I, II & III
 - **Module 11:** Capital & balance sheet management
 - **Module 12:** Corporate governance within banking
 - **Module 13:** Bank strategy inputs and setting
 - **Module 14:** Coherent advice and complex problem solving: case studies
- ⚙ ASSA offering subject for first time in second semester 2015
- ⚙ Students in Malaysia able to sit for exam
- ⚙ Contact person for registrations and more information: Michelle Abrahams (mabrahams@actuarialsociety.org.za)

IFRS 9: Historical Impairment Standard

- Complex and rules based classification methods

- Impairment method based on trigger that are deemed to be too little too late

- Rigid hedge accounting rules that does not reflect actual risk management activities

- Doesn't reflect economic reality as evidenced in the Global Financial Crisis

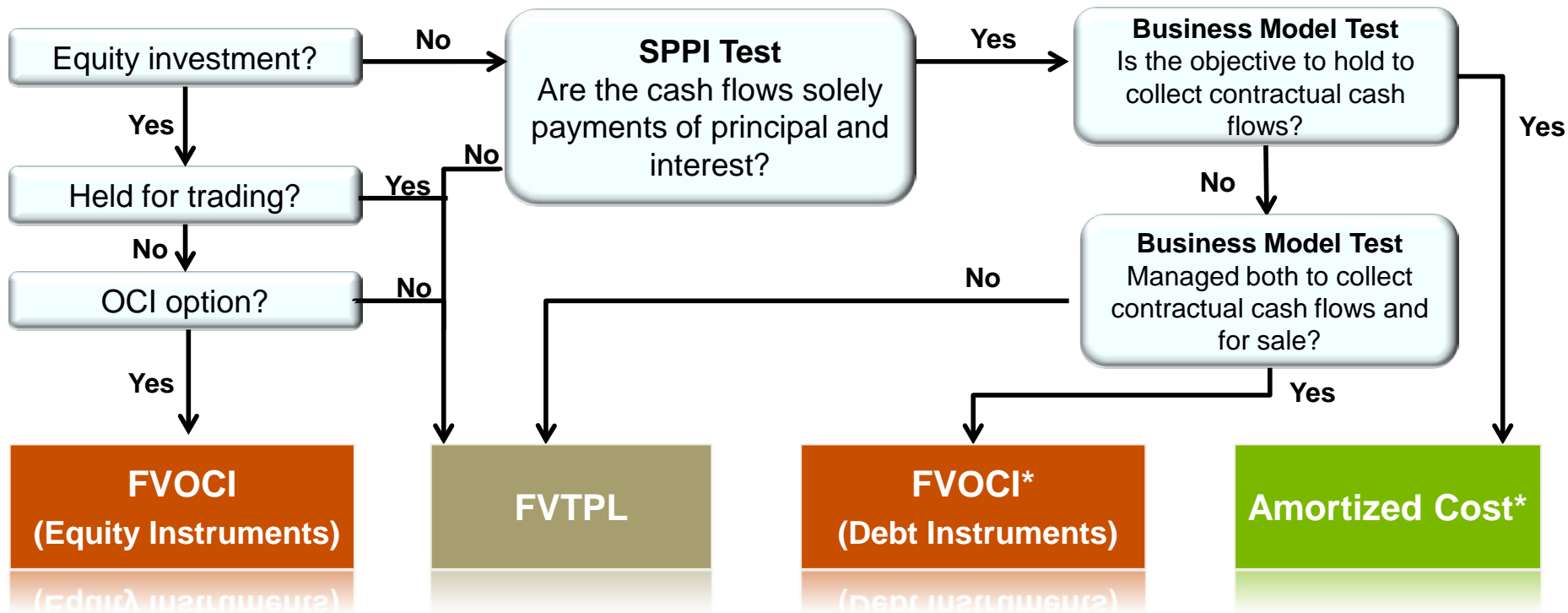


**"The response of the International Accounting Standards Board
If this question was asked to politicians and business**

ARE ACCOUNTING STANDARDS RESPONSIBLE FOR THE GLOBAL FINANCIAL CRISIS?

The 'grey men who sit in dimly lit rooms and dream up accounting standards' are responsible for the current global financial crisis. The glut of criticism has been primarily focused on the method applied to accounting for financial instruments and the requirement to fair value them and, furthermore, that accounting standard setters have caused the financial crisis. Accounting standard setters have been seen as 'lame ducks' - the ones who make no

IFRS 9: Classification & Measurement



* Subject to irrevocable option to designate at FVTPL on initial recognition if it reduces accounting mismatch

IFRS 9: Impairment Charge

Expected credit losses: weighted average of **credit losses** with the respective risks of a default occurring as the weights

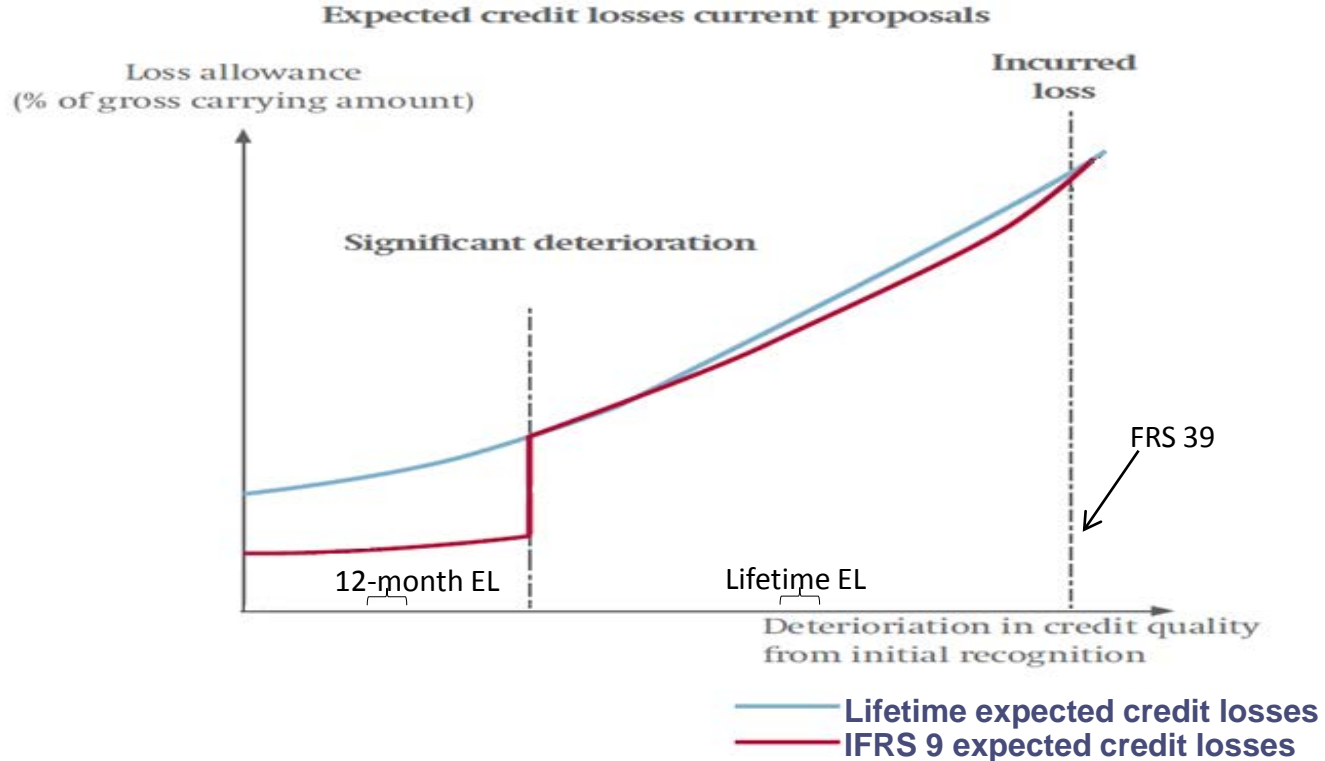
Credit loss: discounted value of the cash shortfall between 'contractual' and 'expected' inclusive of Credit Risk Mitigants (such as collateral and/or guarantees) through the 'expected life' of the financial instrument

Measurement of expected credit losses

An entity shall measure expected credit losses of a financial instrument in a way that reflects:

- a. An *unbiased and probability-weighted amount* that is determined by evaluating a range of possible outcomes;
- b. The time value of money; and
- c. Reasonable and supportable information that is available without undue cost or effort at the reporting date about past events, current conditions and *forecasts of future economic conditions*

IFRS 9: Comparison with the 'Incurred' method



IFRS 9: Parameterisation of Expected Loss

Mathematically equivalent in nature to standard Actuarial problems from life insurance (excluding effects of discounting)

$$L_{i,[0,T_i]} = \int_0^{T_i} \left(e^{-\int_0^u (\lambda_{i,v}^w + \lambda_{i,v}^d) dv} \lambda_{i,u}^d \right) \times (1 - \rho_{i,u}) \times X_{i,u} du$$

Cumulative Incidence Function (CIF)

Contractual term

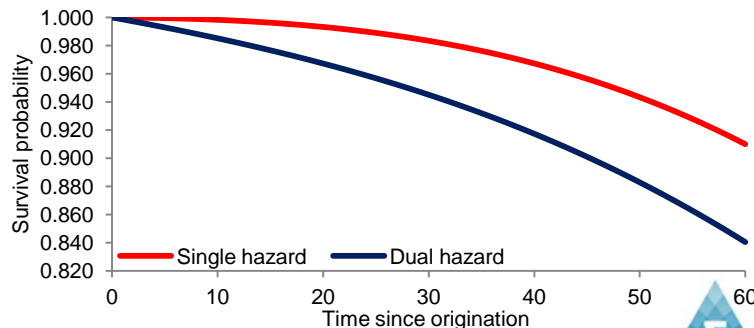
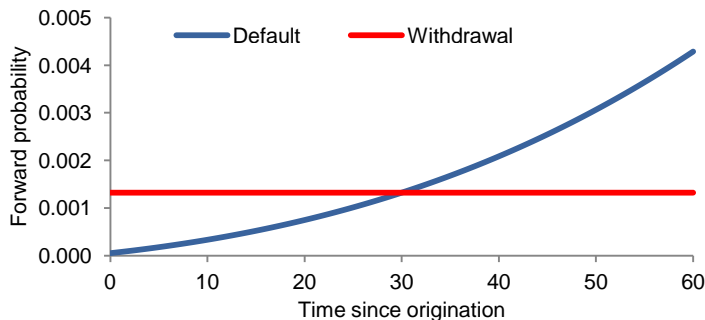
Survival probability

Forward PD

Loss Given Default

Exposure at Default

'Competing Risk' framework - CIF: non-parametric (KM/NA) or parametric (proportional covariate & G-M baseline hazard)



Liquidity risk: introduction

- ⚙ *The risk of an institution being unable to meet its obligations as they become due without incurring excessive costs. Liquidity risk arises when an institution is unable to meet its cash requirements either by obtaining funding or by selling assets.*
- ⚙ In general, there are three central topics that must be effectively managed in order to address firm-wide exposure to liquidity risk:
 - **Market Liquidity Risk** is oriented around price changes and P&L impacts
 - **Funding Liquidity Risk** addresses cash-flow estimation (assets as well as liabilities)
 - **Contingency Planning** (including stress testing) considers how, in the absence of market or funding liquidity, a bank can continue to meet obligations, particularly during periods of stress.

Liquidity risk: moves towards cash flow approach

⚙ *Liquidity Coverage Ratio (LCR):*

$$\text{LCR} = \text{Stock of HQLA} / \{\text{Net cash outflows (30-day)}\} \geq 100\%$$

⚙ *Transitional phased in approach*

⚙ *Cash flow method requires bank to perform cash flow projections arising from on- & off-balance sheet, along various maturity ladders, by significant currencies and under stress scenarios relevant to banks key risk factors*

⚙ *Banks can perform the following*

- *Identify more stable funding sources, key risk factors & funding strategies*
- *Scenario setting & cash flow assumptions used in stress testing*
 - *Specific risk factors most relevant to the banks business activities, asset & liability structure & sources of funds*
 - *Estimate survival period & establish corresponding contingency funding plan (CFP)*

Liquidity risk: High Quality Liquid Assets (HQLA)

Category	Description & weight
Level 1	100% - currency notes, coins, withdrawable central bank reserves, marketable debt securities (>AA-) issued or guaranteed by sovereign, central bank, PSE, MBD or Exchange Fund (EF) debt securities
Level 2A	85% - Marketable debt securities issued or guaranteed by sovereign central bank or public sector entity (A+ to A-), Marketable debt securities issued by corporates (LTCR > AA- or STCR A-), covered bonds (LTCR > AA- or STCR > A-)
Level 3B	75% Approved RBMS issued by PSE, FI, Corporate (LTCR > AA-), backed by Residential Mortgages (full recourse) & LTV (origination) <80%; 50% Corporate marketable debt securities (LTCR > A-)

Liquidity risk: Total expected cash outflow (regulatory)

Category	Description & weight
Retail deposit	Retail deposits are defined as deposits placed with a bank by a natural person (as opposed to a 'legal entity'); 'Stable' – {Established relationship & Transactional accounts (salary deposit)} = 3-5% (run-off), 'Less Stable' = 10%
SME (in line with asset classification)	Non-Natural person, funding callable within LCR horizon (30 days) or contractual maturity within horizon, same treatment as Retail deposits
Operational deposit	Wholesale customer (excl. SME) where bank providing to the customer 'operational services' upon which the customer has become significantly dependent for its business operations & does not arise from institutions provision of correspondent banking services prime brokerage services to customer – 25% (run-off)
Institutional networks of CO-OP banks	An institutional network of cooperative (or otherwise named) banks is a group of legally autonomous banks with a statutory framework of cooperation with common strategic focus and brand where specific functions are performed by central institutions or specialised service providers – 25% (run-off) (subject to additional criteria)
Unsecured wholesale funding provided by non-financial corporates and sovereigns, central banks, multilateral development banks, and PSEs:	This category comprises all deposits and other extensions of unsecured funding from non-financial corporate customers (that are not categorised as small business customers) and (both domestic and foreign) sovereign, central bank, multilateral development bank, and PSE customers that are not specifically held for operational purposes - 20% (EDIS or Public Guarantee) or 40%
Unsecured wholesale funding provided by other legal entity customers	This category consists of all deposits and other funding from other institutions (including banks, securities firms, insurance companies, etc), fiduciaries, beneficiaries, conduits and special purpose vehicles, affiliated entities of the bank and other entities that are not specifically held for operational purposes (as defined above) and not included in the prior three categories – 100%
Secured Funding Transaction	Securities repurchase transaction or securities lending transaction, or other similar transaction entered into by the bank with a counterparty who provides a sum of money or other securities to the institution on a collateralised basis. Level 1 (asset) backed or central bank – 0%, Level 2A backed – 15%, domestic sovereign, PSE or MBD (not level 1 or 2A) or RMBS eligible (level 2B) – 2%, Backed by other Level 2B – 50%, Non-HQLA – 100%

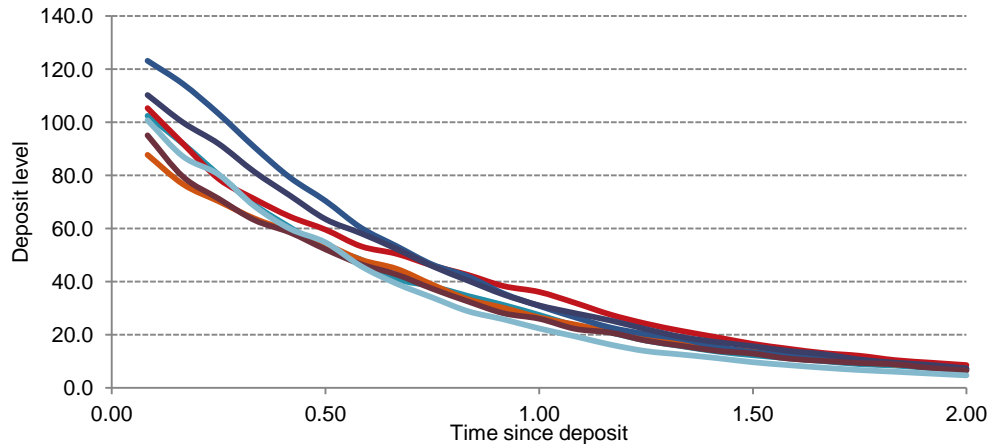
Liquidity risk: Total expected cash outflow (internal)

- ⚙ Empirically (using internal liability data) verify consistency of run-off rates (by segment & cohort) with regulatory assigned factors
- ⚙ Internal segmentation criteria
 - ⚙ Source/distribution channel of the deposit
 - ⚙ Level of rate sensitivity
 - ⚙ Depositor historical relationship with the bank
 - ⚙ Depositor classification (Retail, Small-to-Medium Enterprise, Corporate, Financial Institution etc...)
 - ⚙ Type of the deposit (term, deposit, transferrable)
 - ⚙ Volatility (size & exchangeability of deposit)
- ⚙ Judgmentally assigned run off factor most simplistic method (observed in practice)

Liquidity risk: Total expected cash outflow (internal)

- ☼ **Option 1:** 'geometric decay' ($\alpha_i < 0$) process (by segment & sample cohort)

$$d \ln(X_{i,t}) = \alpha_i dt + \sigma_i dZ_{i,t} \quad X_{i,T} = X_{i,0} \exp(\alpha_i T + \sigma_i T^{1/2} \zeta_i)$$



Liquidity risk: Total expected cash outflow (internal)

- ⚙ **Option 2:** econometric techniques (by cohort & tenor) – stylized regression model

$$\Delta \ln(X_{i,t}) = \alpha_i + \beta_i \ln(X_{i,(t-1)}) + \sum_{l=0,\dots,L} \chi_l r_{i,(t-l)} + \sum_{m=0,\dots,M} \delta_m Z_m + \varepsilon_t$$

- ⚙ Function of applicable rate of interest, exogenous risk factors & error structure
- ⚙ Factor selection algorithm: ‘data mining’ vs. ‘fundamental analysis’
- ⚙ Advantage: objectivity, insight & forecasting
- ⚙ Disadvantage: granularity & length time series, cost of implementation & maintenance

Integrated Risk Management: Financial Conglomerate



OJK Introduces Integrated Oversight of Financial Conglomerates

POJK No: 17/POJK.03/2014

Regarding the application of integrated risk management for financial conglomerates

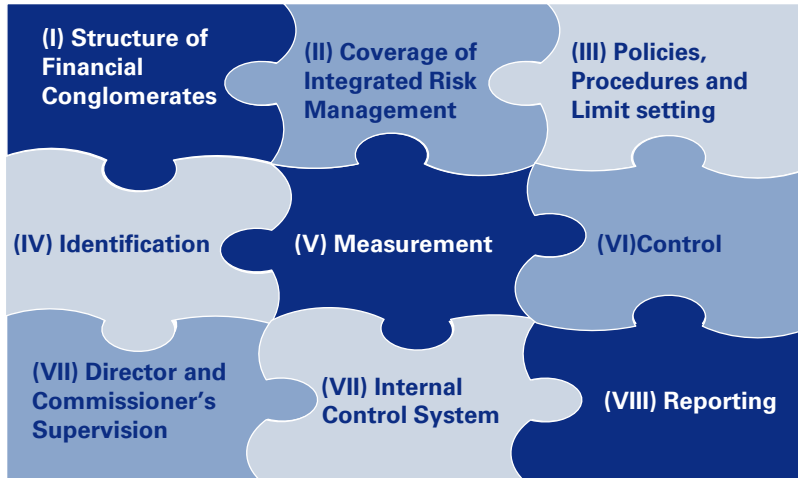
- Supervision by management of the principal unit
- Adequate integrated restrictions, procedures, and risk policies
- Adequate identification processes, monitoring mechanisms, measurements and IT systems to manage integrated risks
- A complete risk management internal control system

POJK No: 18/POJK.03/2014

Regarding the application of integrated governance for financial conglomerates

- The management and board of supervisors' specific duties and responsibilities
- The preparation and implementation of guidance on governance
- The integrated governance committee and its taskforce's specific duties and responsibilities
- The application of integrated risk management policies

Overview of Integrated Risk Management in Financial Conglomeration



<input checked="" type="checkbox"/>	FS group structure
<input checked="" type="checkbox"/>	FS group board and commissioner
<input checked="" type="checkbox"/>	FS group integrated risk committee and working unit
<input checked="" type="checkbox"/>	FS group integrated risk identification, measurement, monitoring and control/management process
<input checked="" type="checkbox"/>	FS group integrated risk policies and procedures
<input checked="" type="checkbox"/>	FS group integrated limit
<input checked="" type="checkbox"/>	FS group integrated internal control system
<input checked="" type="checkbox"/>	FS group integrated reporting mechanism and system

- FS conglomeration capital adequacy
- Effective liquidity management
- Integrated intergroup transaction monitoring
- Effective funding risk management
- Effective integrated governance

Thank you

Questions?