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# Risk-Based Supervision

Presented to

## BAPEPAM-LK

**Sarah W Hargrove, CFA**

**Jakarta - June, 2012**

# Agenda

1. Introduction to Workshop
2. Part 1: Relationship between Risk-based Supervision and Risk Management
3. Part 2: Overview of Risk Management
4. Part 3: Overview of Risk-based Supervision
5. Review and Summary
6. Develop Action Plan to Transition to RBS

# Introduction to Workshop

1. Logistics
2. Introductions
  - Sarah W Hargrove
  - Participants
3. Objectives of Workshop

# Logistics

1. Times
2. Lunch
3. Breaks
4. No cell phones!
5. Batik Friday?

# Sarah W Hargrove

- ❑ Native of North Carolina
- ❑ Wharton MBA, CFA
- ❑ Thirty years of experience in investment and commercial banking in NY, NC and PA
- ❑ Top bank regulator in Commonwealth of PA for banks, savings institutions, licensed lenders
- ❑ Consulting for past 15 years in primarily emerging markets (technical assistance and training in bank appraisals, risk management and corporate governance)
- ❑ Worked with Central Banks and DICs in risk management, market risk, early warning system, and corporate governance

# Participants

SEADI is a joint project of the U.S.  
Agency for International Development  
and the Republic of Indonesia

# Objectives of Workshop

- ❑ To understand what constitutes RBS and how it differs from compliance supervision
- ❑ To have a common understanding of risk in a financial system and how it is identified, measured and managed
- ❑ To understand what a risk management framework is and the role of supervised entities in RBS
- ❑ To develop an action plan to transition to RBS

# Part 1

## **Relationship between Risk-based Supervision and Risk Management**

- ❑ Background for Risk-based Supervision
- ❑ Risk-based vs compliance supervision
- ❑ New regulatory framework
- ❑ Development of Bapepam's own Risk Map

# Background for Risk-based Supervision

# Worldwide trends have increased risks for financial institutions in all markets

- ❑ Globalization and liberalization of markets
- ❑ Privatization/Consolidation
- ❑ Increased competition
- ❑ Technology
- ❑ Increased volatility
- ❑ New complex financial instruments
- ❑ Increased transparency and access to information

# Financial institution regulators and supervisors have responded...with a lag

- ❑ Deregulation of interest rates, markets and institutions
- ❑ Replaced with regulation of capital
- ❑ Harmonization of international capital standards for large, internationally active banks (BIS I, BIS II, BIS III)
- ❑ Increased emphasis on governance
- ❑ Increased focus on risk management and alignment of capital required and management incentives

# Convergence of international standards for effective supervision

- ❑ Core Principles of Effective Banking Supervision
- ❑ Risk-based supervision adopted by other financial regulators
  - IOPS (Pensions)
  - IOSCO (Securities)
  - IAIS/NAIC (Insurance)
  - FINRA (Brokers, Dealers)
  - IADI (Deposit Insurers)
  - Consumer Protection/Conduct?

# Risk-based vs Compliance Supervision

# What are your objectives in compliance supervision?

# What would your objectives be in risk-based supervision?

# The distinction is usually made between rules vs principles-based supervision

Compliance/Rules Based	Prudential/Principles Based
Minimum capital	Capital f (risk profile and management of risks)
Maximum gearing	Fit and Proper
Fit and Proper	Disclosure
Disclosure	KYC
KYC	Prohibited activities
Prohibited activities	Reporting requirements
Reporting requirements	Forward looking
Backward looking	Etc
Etc	Etc
Etc	

Risk-based supervision is not alternative to compliance-based supervision: it is a way achieving compliance !

# Why be concerned about prudential supervision of multi-finance companies?

*Policies that protect the interests of consumers of financial products and services contribute to enhanced risk management by households, more competitive financial markets, and greater financial stability.*

Source: Financial Stability Forum: Paper "Consumer Finance Protection with particular focus on credit," 26 October 2011

# Prudential and conduct supervision contribute to financial stability

- ❑ Role of multi-finance companies in the economy
  - Overall leverage and credit expansion
  - Inter-connectiveness
  - Contagion
- ❑ Lessons from the global financial crisis of 2007-2008
- ❑ “Herd” instinct: fairness and competitiveness
- ❑ Recourse for fines or to make consumers whole

# The focus of RBS is on the risk profile of supervised entity

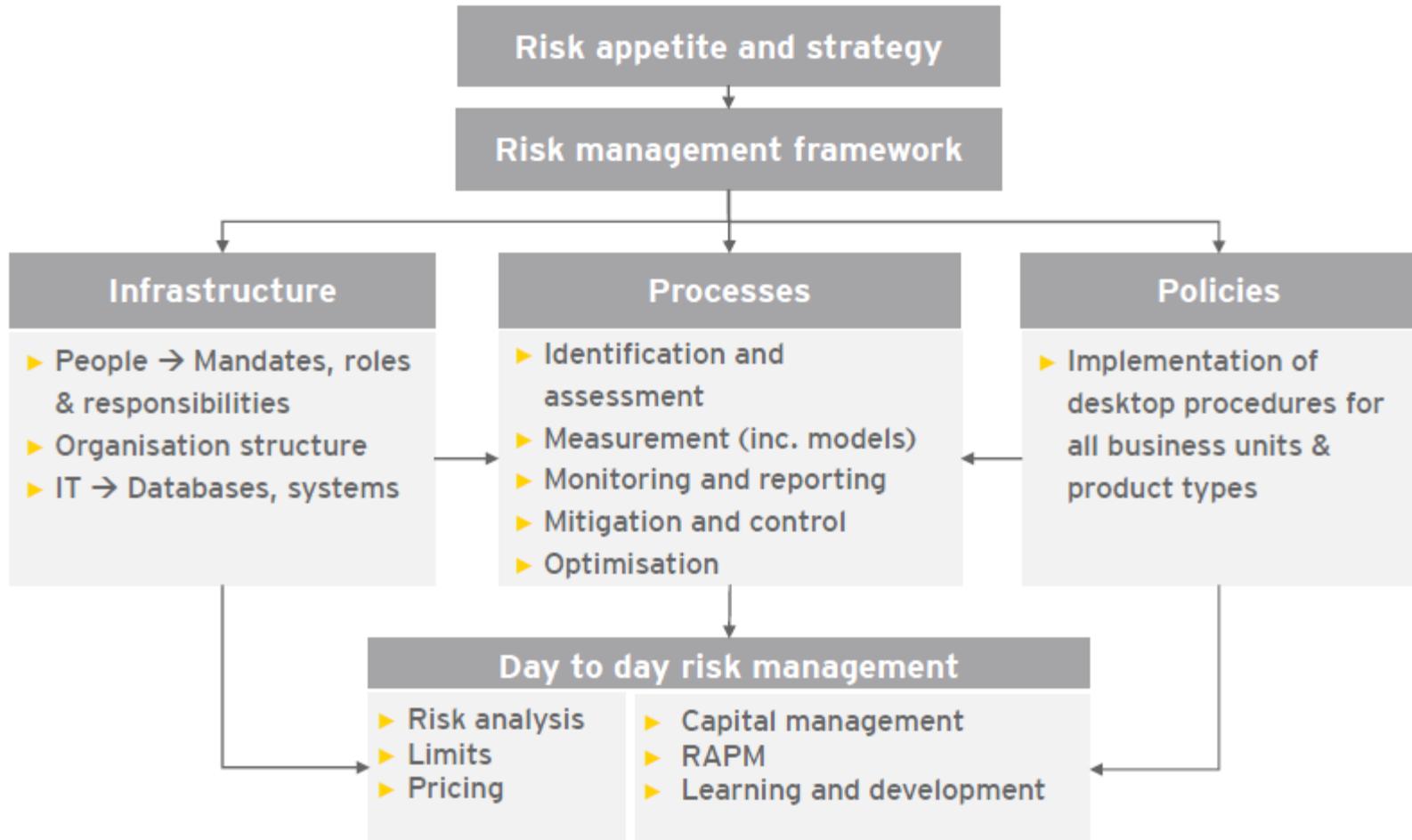
- ❑ Position in sector
  - Captive vs independent
  - Foreign vs domestic
  - Access to public markets
- ❑ Markets served and markets accessed
- ❑ Competitiveness
- ❑ Risk management capability

# Development of Bapepam's Own Risk Map

# Risk management is a prudent business practice for all organizations

- ❑ Banking sector
  - Capital based regulation
  - Capital allocation for unexpected losses
- ❑ Government and non-profits have similar motivations
  - Risk to fulfilling mandate or accomplishing objectives
  - Financial and non-financial
- ❑ Both rely on quantitative measures of risk
- ❑ Both focus on quantity of risk and quality of risk management; the “cost to control”

# RM/ERM/ORM framework integrates several components of a business



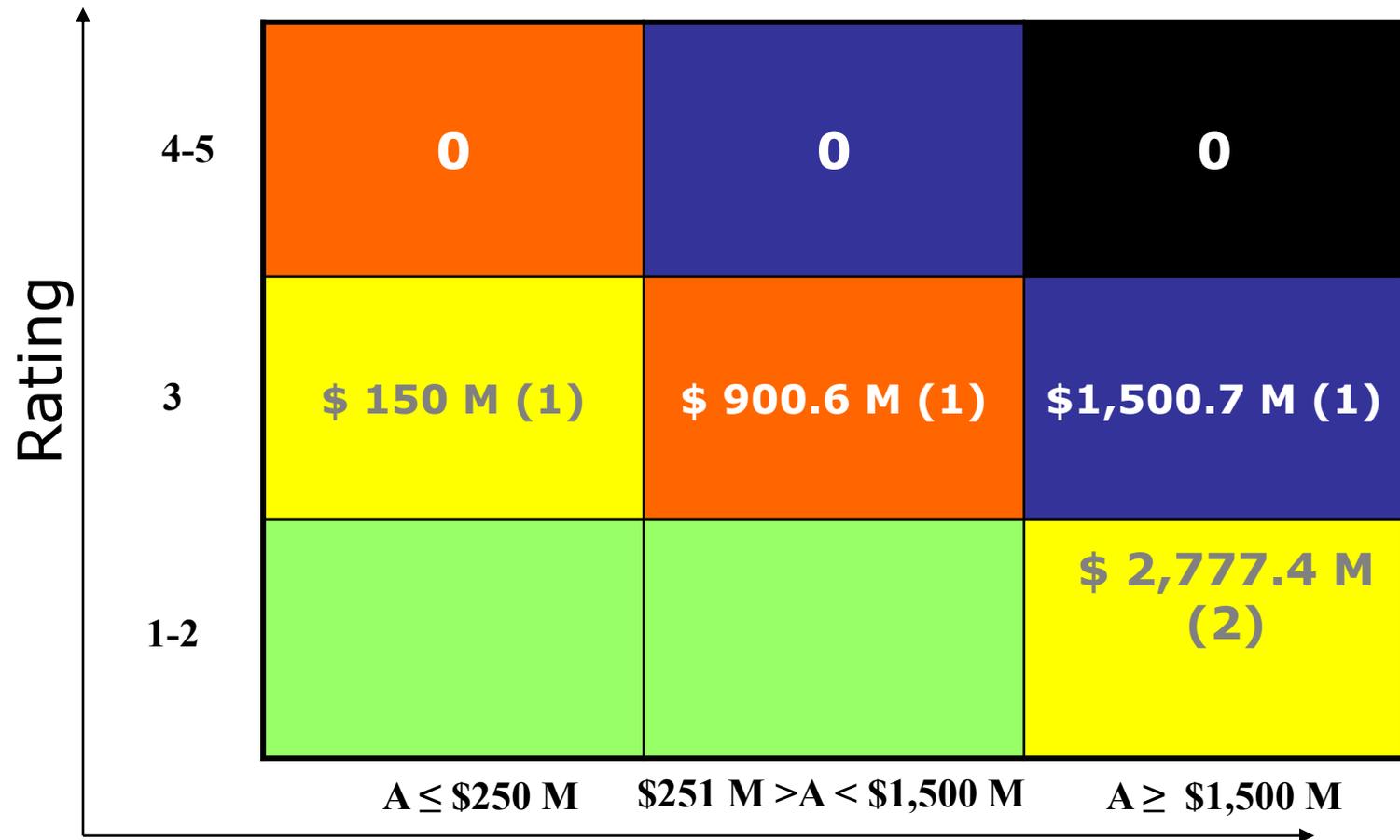
# There are different motivations for non-profit or government agencies

For-Profits	Government/NFP
Profit Objective	Mandate/Mission Objective
Cost/Benefit	Cost/Completion
Efficiency Focus	Effectiveness Focus
Risk Seeking	Risk Avoiding
Value at Risk	Goal/Objective at Risk

Source: Federal Reserve  
Bank of Richmond

SEADI is a joint project of the U.S. Agency for International Development and the Republic of Indonesia

# Assess impact and probabilities for your own risk map



# Part 2

## Overview of Risk Management

- ❑ Overview of risk in a financial system
- ❑ What is risk management?
- ❑ Financial institution earnings analysis model and the risk/reward trade-offs

# Overview of Risk in a Financial System

# The economic system includes the financial system and participants

## Sources of Funds

(Surplus accounts or Savings)

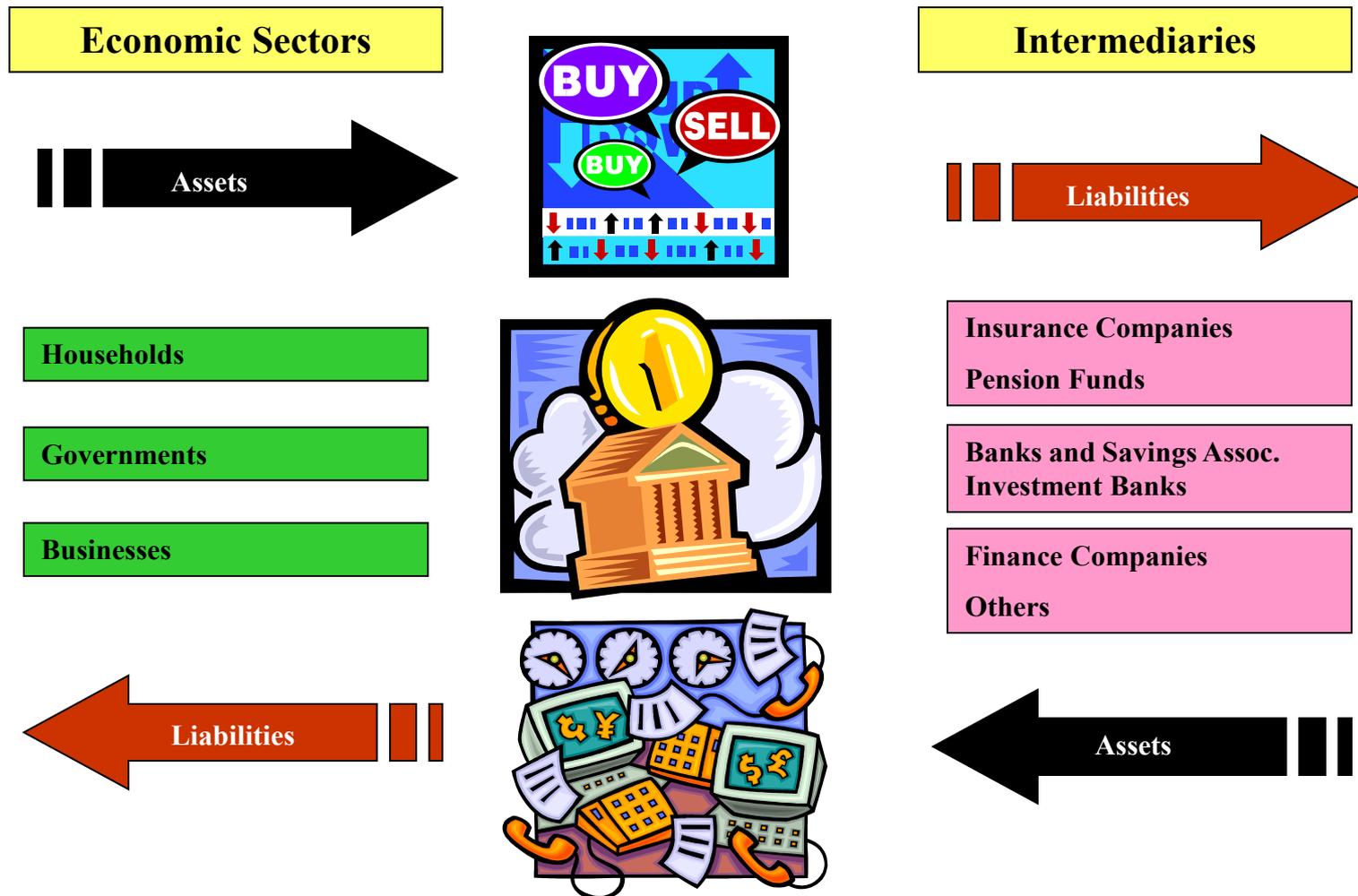


## Users of Funds

(Deficit accounts or investments)



# The financial system includes the markets and intermediaries

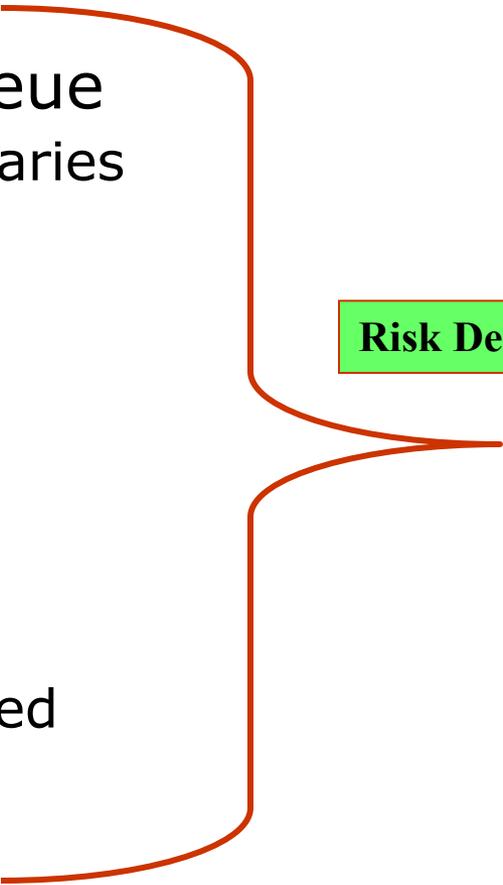


# Certain principles rule financial intermediation in free markets

- ❑ Supply and demand
  - Interest rate as the “clearing price”
  - Opportunity cost of consumption/investment
- ❑ Rational investors
  - Risk averse
  - Maximize return/Minimize risk
- ❑ Efficient markets
  - Allocation of resources
  - Information impounded in prices
  - Competition
  - Economies of scale

# Financial instruments are claims on future cash flows

- ❑ Place in payment queue
  - Financial intermediaries
  - Equity has last call
- ❑ Maturity
  - Term
  - Interim payments
- ❑ Liquidity
  - Traded or non-traded
  - Features



**Risk Determinants**

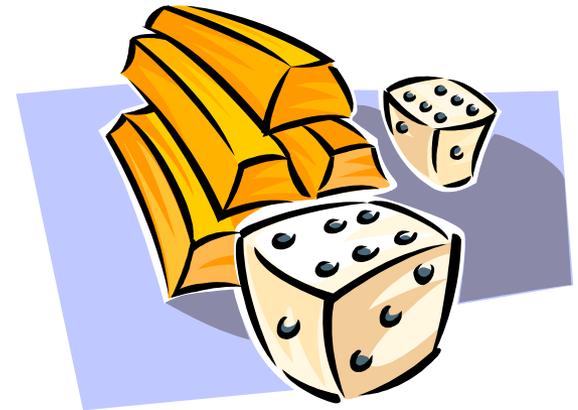
# Basic quantitative methods are used to evaluate assets and liabilities

- ❑ Basic algebra
  - Probabilities
  - Expected value
- ❑ Present value vs future value
  - Opportunity cost of \$ today
  - Inverse relationship between rates and prices
- ❑ Statistics
  - Measures of central tendency (Median, mean and mode)
  - Measures of dispersion (Range and std deviation)
  - Regression analysis and correlation

# What is risk?

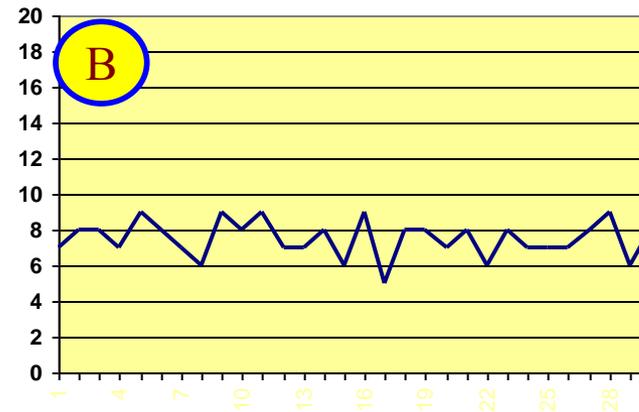
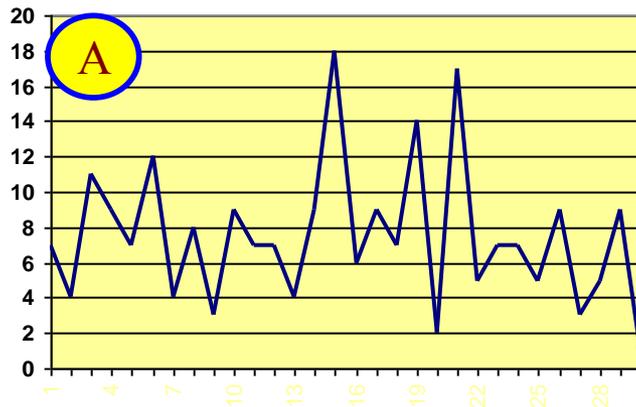
The concept of financial risk underlies modern portfolio theory with roots in capital market and investment theory

- Risk aversion
- Risk premiums
- Historical and expected returns
- Probability distributions
- Variance and standard deviation
- Systematic vs diversifiable risk

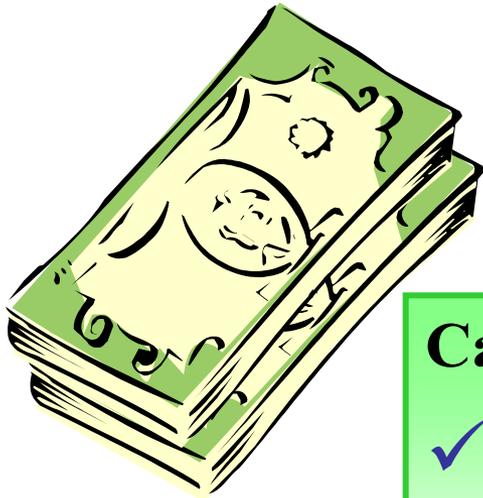


# Perceived risk is based on historical or expected volatility

- Risk is uncertainty
- Risk is symmetrical: positive or negative
- Concern usually with the negative side – i.e., downside/loss
- Risk management has a cost



# What is return?



**Time  
value of  
money**

- Cash flows**
- ✓ **Net income**
  - ✓ **Dividends**
  - ✓ **Capital appreciation/gains**

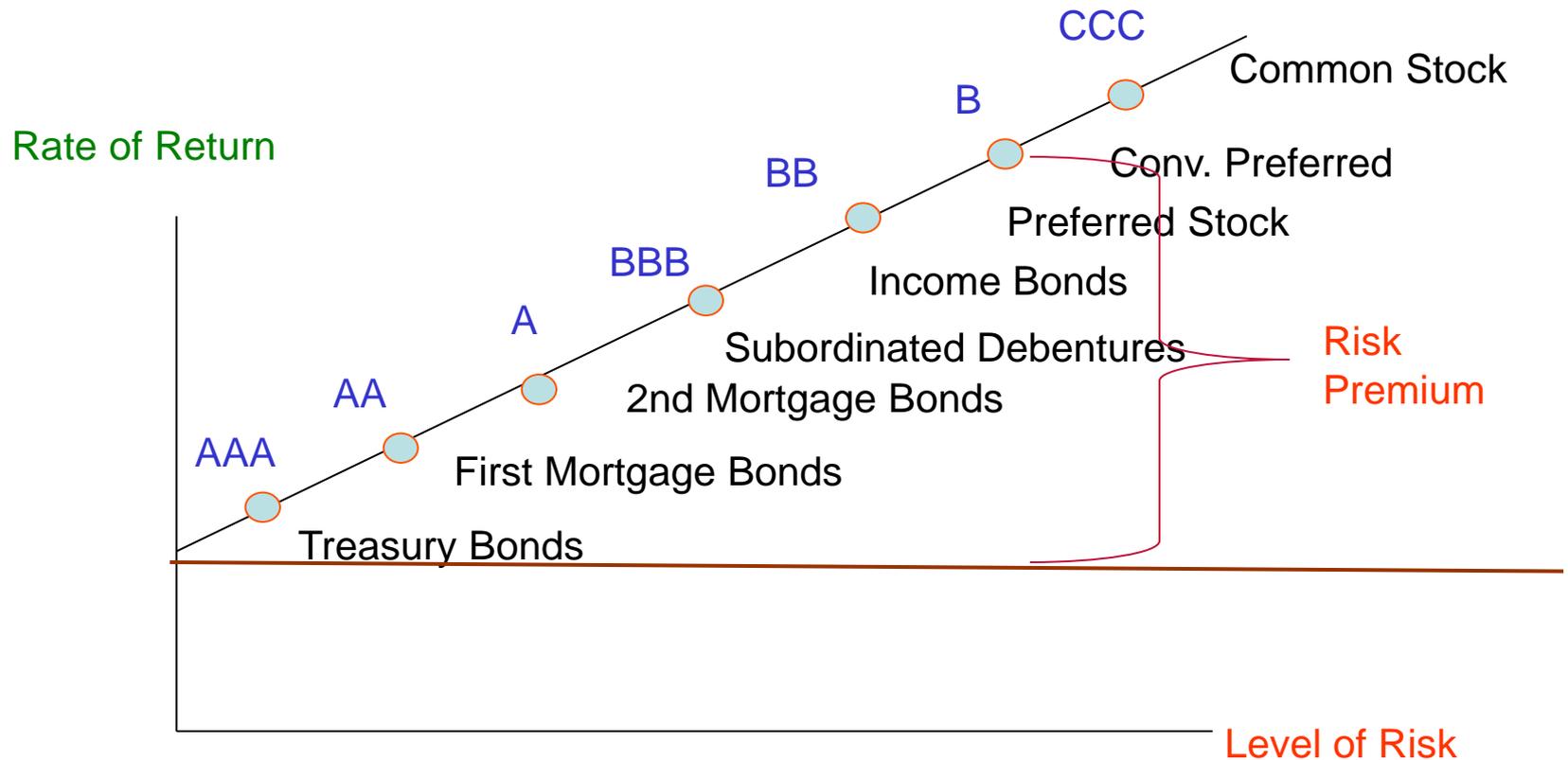
$$PV = \sum \frac{C}{(1+r)}$$
$$FV = \sum C (1+r)$$

# The higher the risk, the higher the required rate of return

- ❑ Required rate of return determines the price
  - Current income stream
  - Capital appreciation
- ❑ Based on perceived risk
  - The greater the historical volatility the greater the risk
  - The greater the uncertainty the greater the risk
  - The longer the horizon the greater the risk

# Risk is priced by the discount rate: absolute and relative

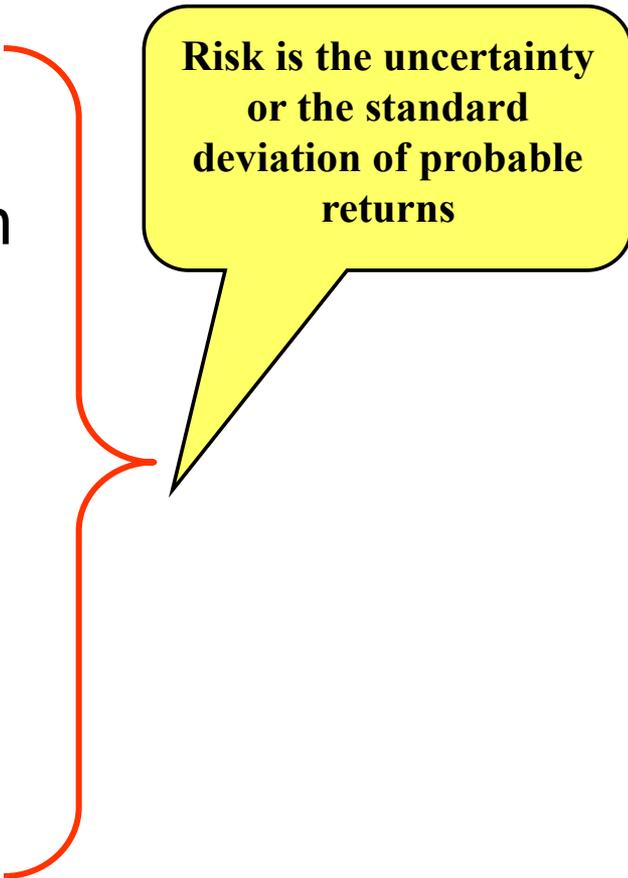
$$MV = PV = \frac{TV}{(1+r)^N} + \sum_{i=1}^N \frac{D_i}{(1+r)^i}$$



What is Risk Management?

# There is risk-reward trade-off inherent in financial intermediation

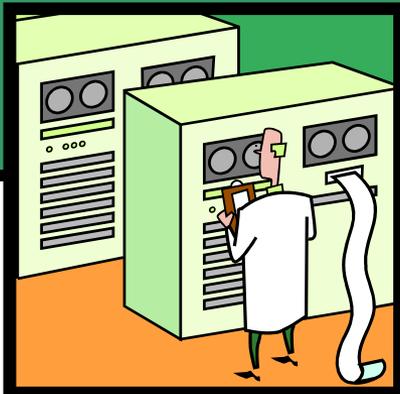
- Short-term vs longer-term
- Liquidity
- Floating vs fixed rates
- Credit
- Leverage



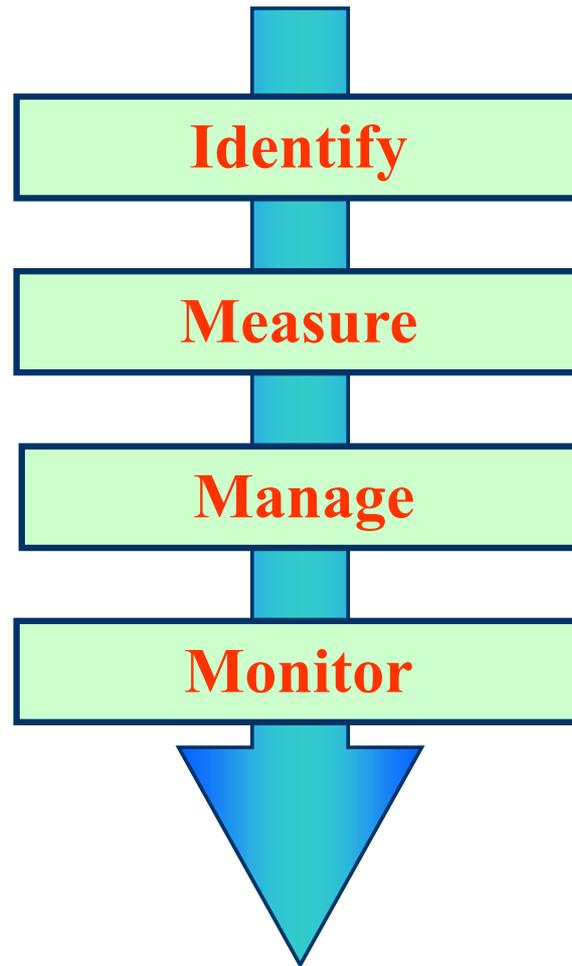
**Risk is the uncertainty or the standard deviation of probable returns**

# A formalized risk management framework is best practice

Risk Management is the deliberate *acceptance of risk for profit* – making *informed decisions* on the trade-offs between risk and reward and using various financial and other tools to maximize risk-adjusted returns within *pre-established limits*.



# A Risk Management framework facilitates informed decision-making

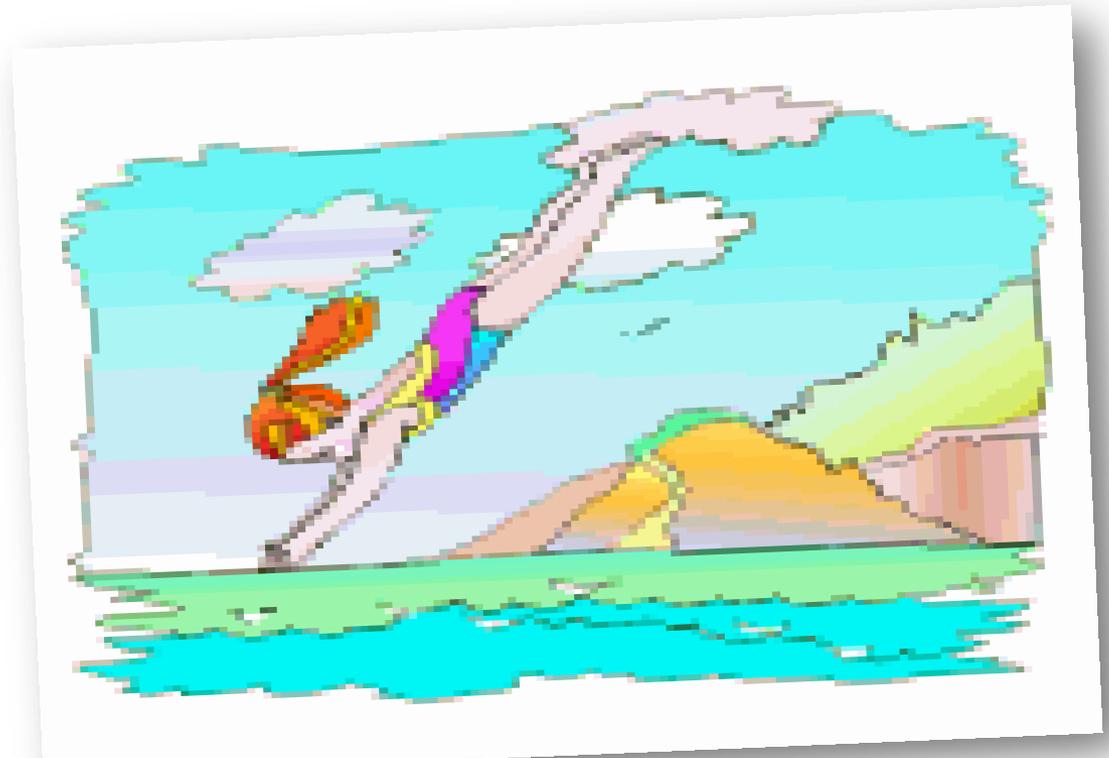


# Risk Measurement is key

Saying “Don’t take too much risk”

is like saying

“Don’t swim too far from shore”

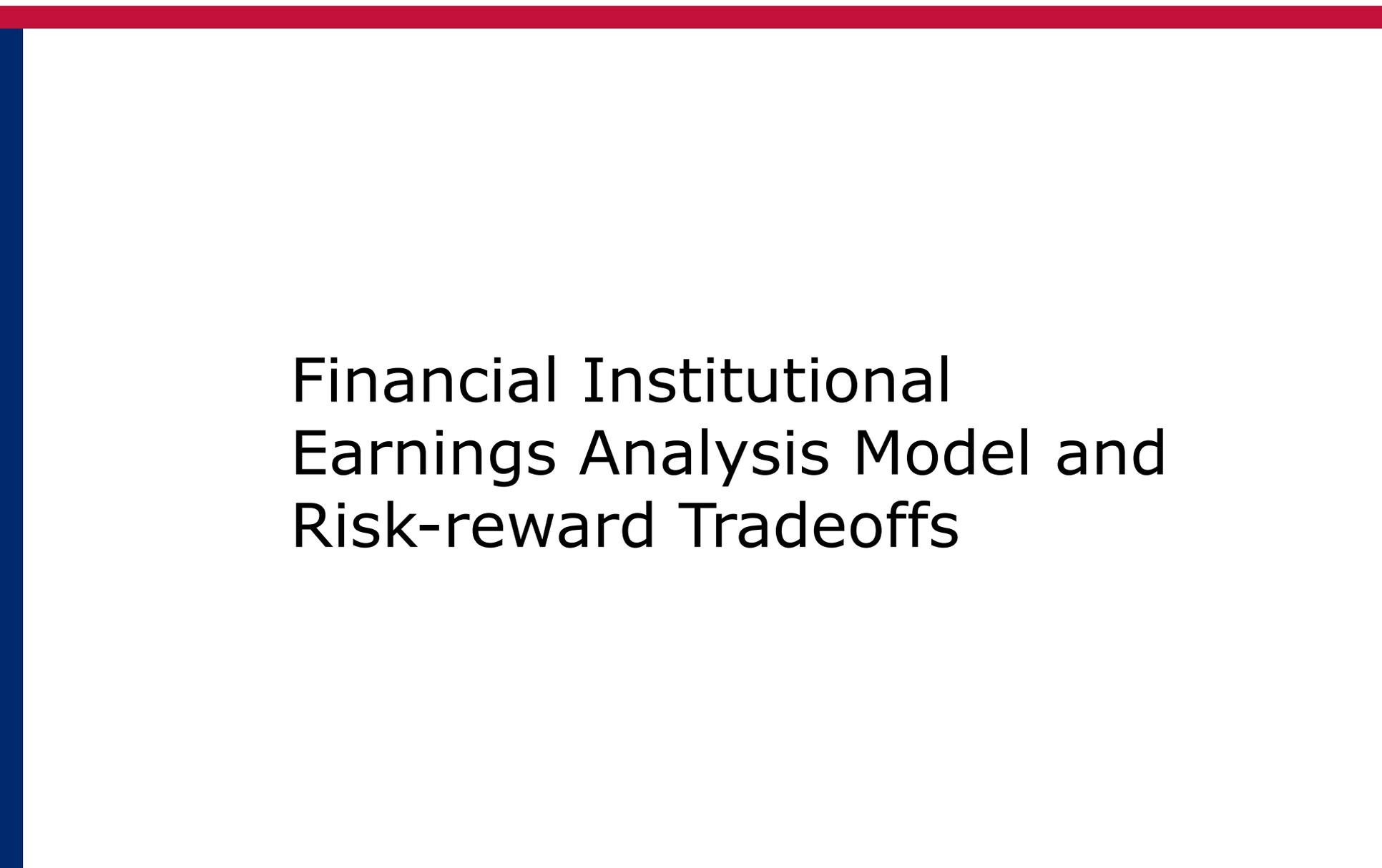


# And risk monitoring is also key

- ❑ Management Information System
- ❑ Reporting procedures
  - Independent risk management
  - Credit review
- ❑ Internal controls
  - Ensure accuracy of information
  - Preventive vs. Detective
- ❑ Internal audit
  - Compliance
  - Operational
  - Risk-based

# Risk management integrates processes





# Financial Institutional Earnings Analysis Model and Risk-reward Tradeoffs

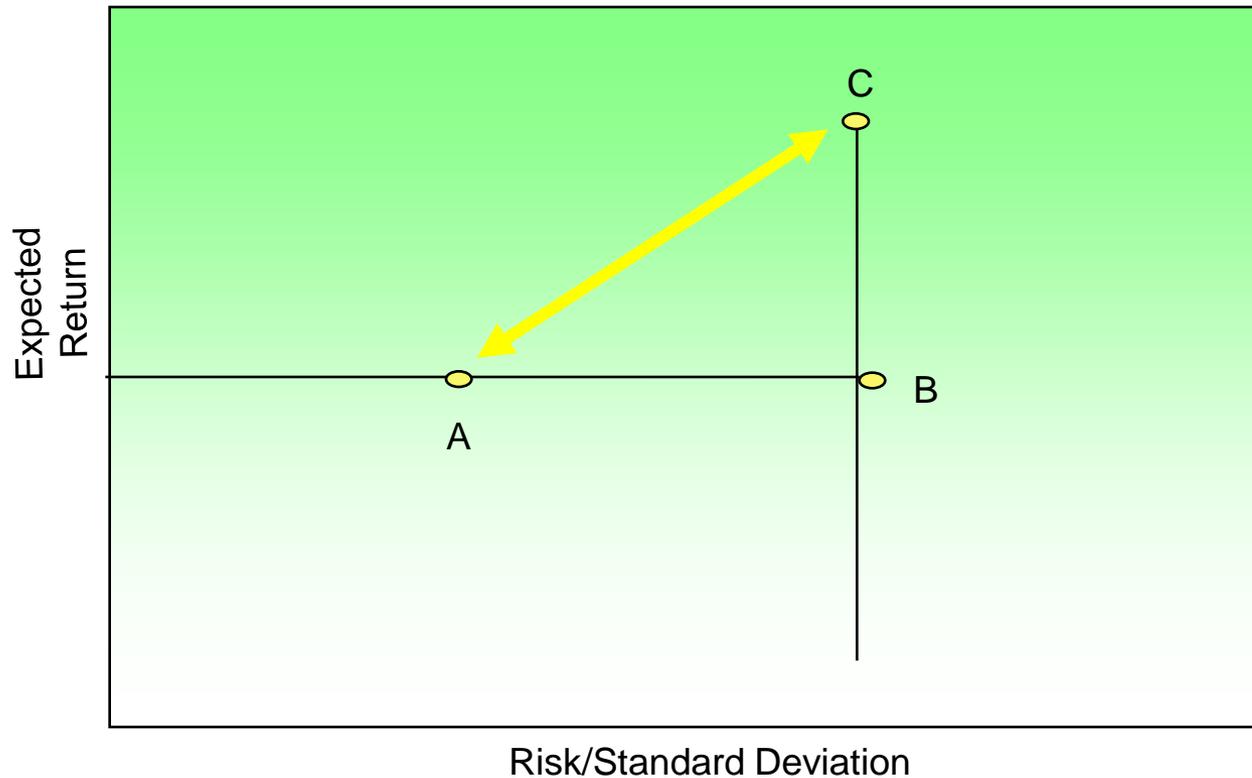
# Risk management permits optimization of the risk-reward trade-offs



**The primary objective is to minimize the volatility of earnings and capital (hence the risk as perceived by investors) and at the same time earn a ROE to maintain the value of the common equity.**



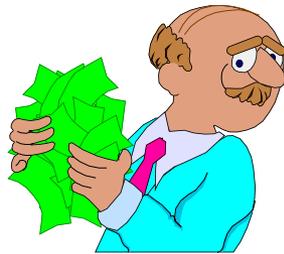
# Risk management improves *ex ante* decision making



# Purpose of risk taking is return on capital and/or growth of capital

- ❑ ***Financial institutions make money by assuming risk***
- ❑ ***They lose money by not managing risk or by not getting paid for the risk assumed***
- ❑ ***They manage what they measure***

# Management has to answer to different stakeholders



Owners



Customers



Regulators/Rating Agencies



Employees

# So how much capital does a FI need?

“Enough...but not too much.”

# Capital is in the eyes of the beholder

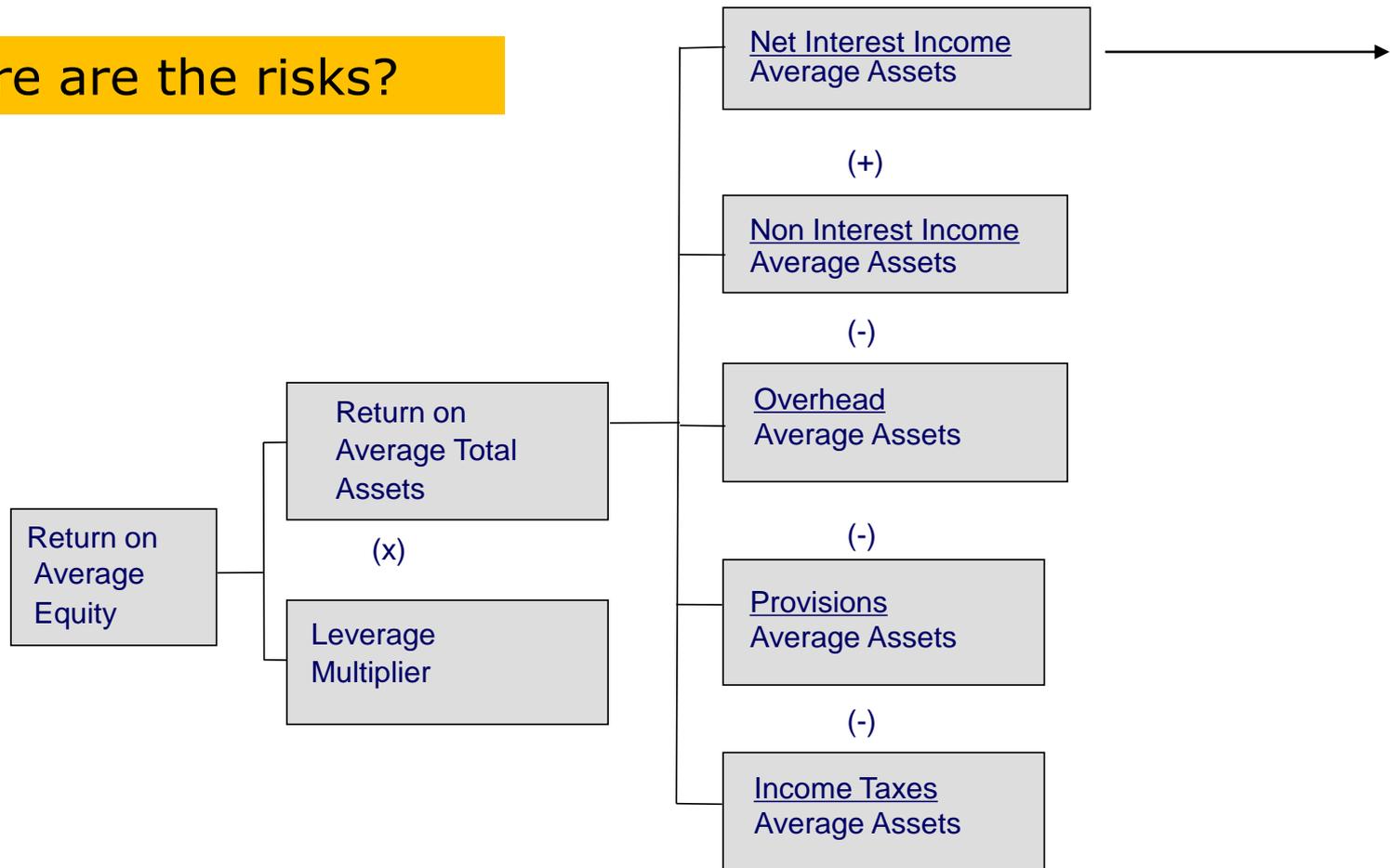
- Accounting capital → Focus is historical cost of assets and recognition of impairment (fair value)
- Market capital → Focus is income, the market's expectations and required return
- Economic value/capital → Focus is market value (PV of cash flows) of assets/liabilities
- Regulatory capital → Focus is balance sheet and income risk and capital components

# In a perfect world the different values would be equal

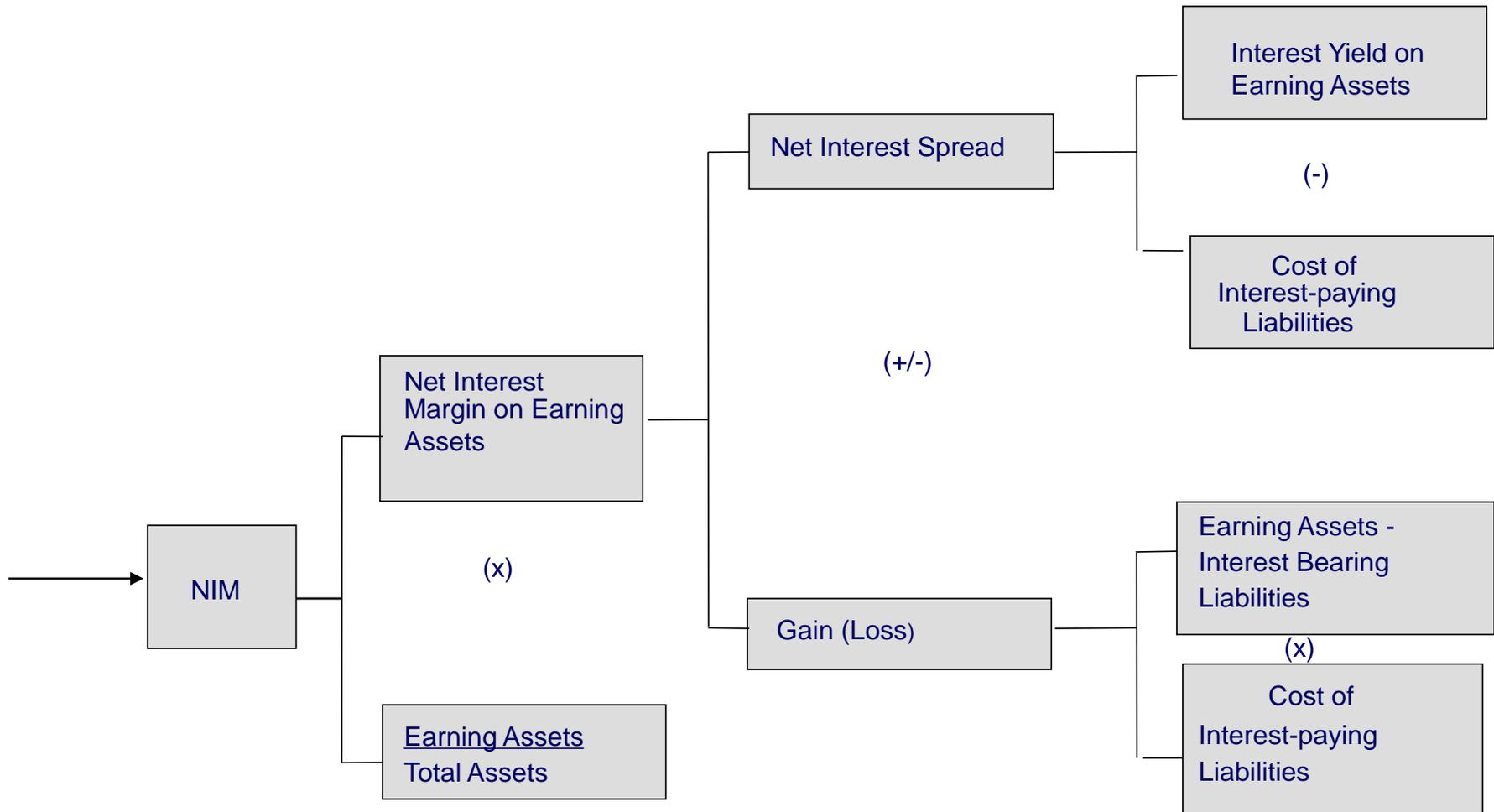
- ❑ Book values would represent present values of future cash flows discounted at current required rates of return
- ❑ Market values of capital stock would reflect net present values of assets
- ❑ Economic capital (or economic value of equity) would be the same as net book value
- ❑ Regulatory capital would be a realizable value of assets in excess of liabilities

# Risk management's objective is to have a predictable level of earnings

Where are the risks?



# Predictable earnings begin with the asset-liability structure



Exercise: Compare and contrast risk profiles of different FIs in Indonesia

# Part 3

## Overview of Risk-based Supervision

- ❑ What is risk-based supervision?
- ❑ Components of effective supervisory framework
- ❑ Integrating risk assessment with supervisory activities
- ❑ Role of qualitative judgment and discretionary powers
- ❑ Risk assessment process

# What is Risk-Based Supervision?

# Risk-based supervision is best practice

- ❑ Allows examination and supervisory response to be tailored to condition of the entity
- ❑ Permits qualitative response to different business models and levels of risk-taking—no “one size fits all”
- ❑ Provides integrated approach that is common across different types of entities
- ❑ Is a more effective way of assessing financial entities in a rapidly changing market
- ❑ Is forward-looking

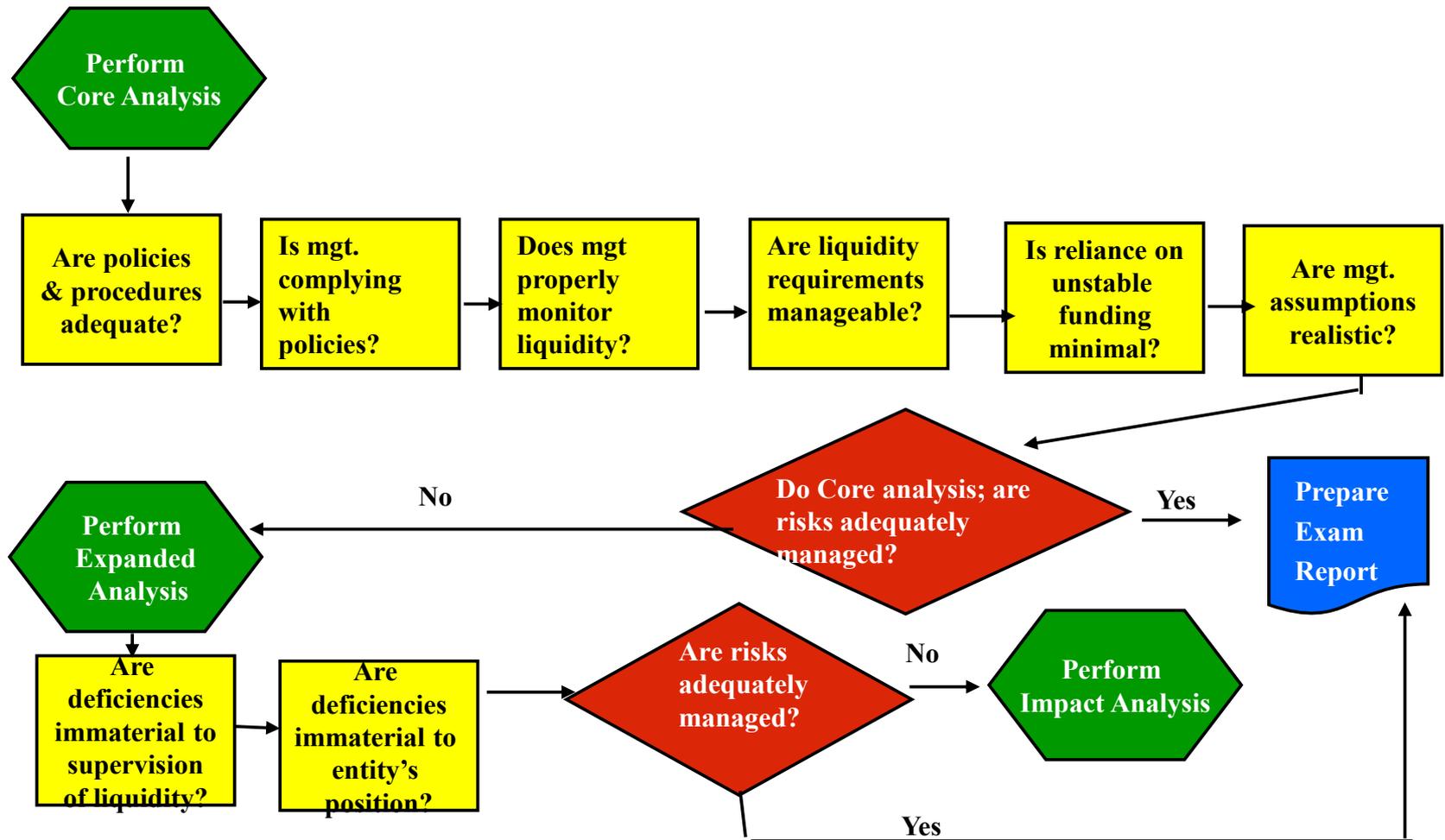
# Focus is on the entity's level of risk and policies and processes



# Benefits of risk-based supervision

- ❑ Focus on condition and operations of entity and not just on compliance with regulations
- ❑ Good risk management underpins compliance
- ❑ Links supervisory response to risk rating
- ❑ Permits efficient allocation of resources
- ❑ Helps strengthen supervised entities with “value added” examinations
- ❑ Strengthens the stability of the financial sector
- ❑ Provides common language of risk assessment across sectors

# Example of a risk-focused assessment of liquidity risk



# All on-site and off-site examiners should be trained in risk assessment

- ❑ Specialized expertise available in supporting unit as needed
  - Market risk
  - Derivatives
  - Complex products
- ❑ Upgrades agency's institutional capacity
- ❑ Increases flexibility for allocating resources
- ❑ Ability to use high level rating or classification committee to confirm findings

# Components of Effective Supervisory Frameworks

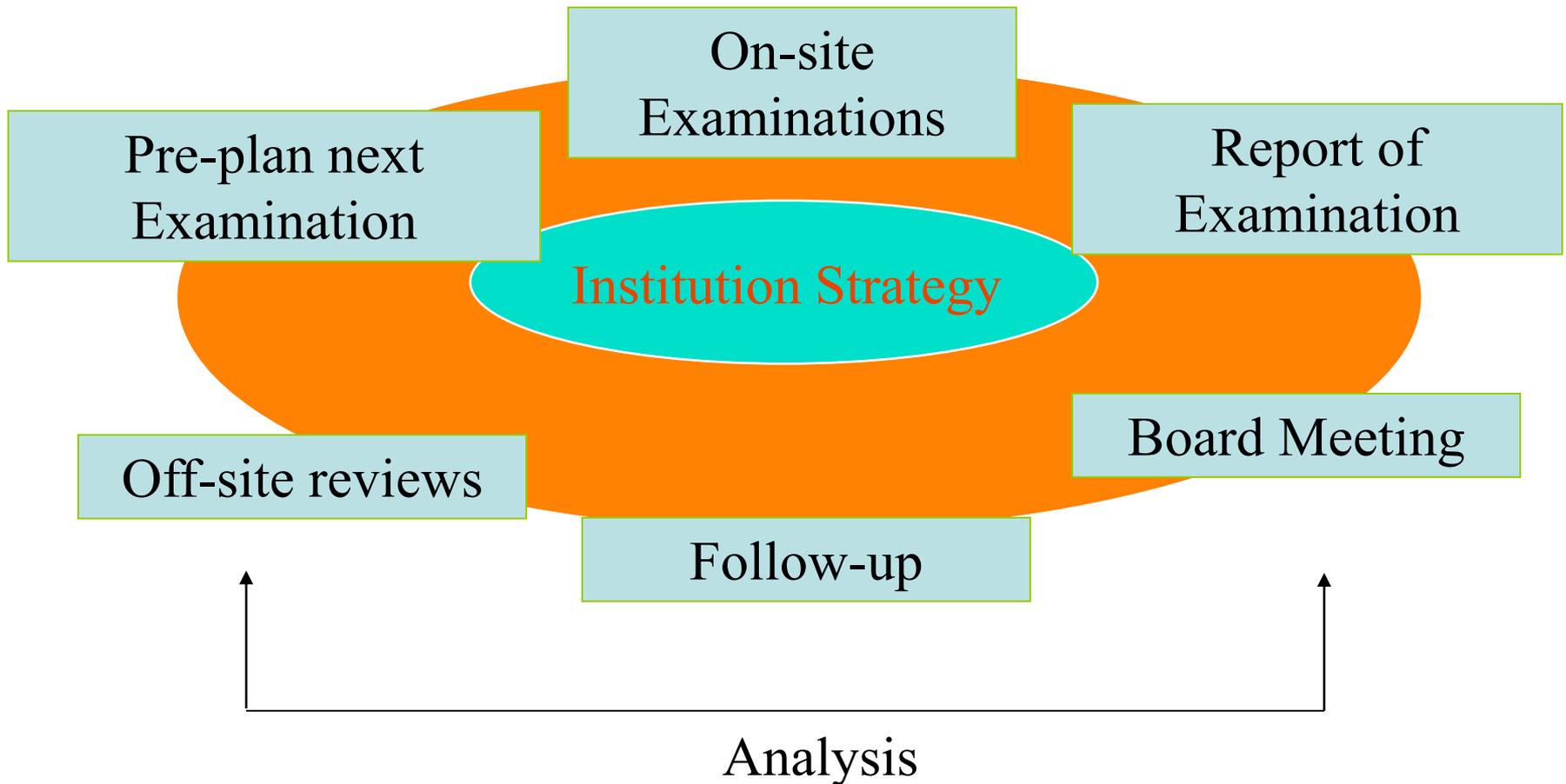
# An effective Supervisory framework has several characteristics

- ❑ Facilitates attaining agency's mission, goals and objectives
- ❑ Is timely and appropriate
- ❑ Optimizes supervisory resources
- ❑ Provides good communication between industry and agency
- ❑ Helps strengthen supervised entities
- ❑ Fosters good public relations

# An effective Supervisory framework has several components

- ❑ Prudential review
  - Statutory requirements
  - Consolidated reviews
  - Establishes subsequent supervisory stance
- ❑ Risk rating of institutions
  - Peer group analysis and benchmarking
  - Linked to supervisory response
- ❑ Consultation following review and *ad hoc* visits
- ❑ Reporting and off-site monitoring and reviews
- ❑ Appropriate early warning system/signals

# The Supervisory cycle is continuous and begins with a strategy



# What is a Supervisory Strategy?

- ❑ Written guide to supervisory efforts over the course of the supervisory cycle
- ❑ Review of past events
- ❑ Plan for future supervisory activities
- ❑ Resource utilization plan
- ❑ Summary of supervisory objectives

# Why have a Supervisory Strategy?

- ❑ Aids in planning supervisory activities
- ❑ Facilitates allocation of appropriate resources
- ❑ Targets activities to where needed the most
- ❑ Provides a consistent and approved approach to financial institution supervision
- ❑ Optimizes the examination flow
- ❑ Based on risk management assessment



# Integrating Risk Management Assessment and Supervision

# Risk management is a double-sided coin with two dimensions

Risk Management from a **Entity Perspective**

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Risk Management in **Supervision**

# How is risk assessment integrated into supervision process

- ❑ Use of financial analysis and composite ratings as a risk assessment tool
- ❑ Assessment of risk management framework is part of the exam work programs
- ❑ Off-site activities are integrated into the supervisory process
- ❑ Follow-up activities are based on risk rating and early warning signals
- ❑ Enforcement actions are linked to risk rating

# Risk ratings assess quantity of risk and quality of risk management

- ❑ By functional areas and risk categories
- ❑ To facilitate appropriate supervision
- ❑ To provide consensus of condition of entity and their operations
- ❑ To assist entities in improving results
- ❑ To provide concise information to the entity's management

# Good risk management encompasses compliance

## Compliance

- ▶ Ensures that lending, accounting and investment practices adhere to set laws and regulations:
  - Code of conduct / Ethics
  - Confidentiality
  - AML
  - Insider Policy
  - Consumer Protection
  - Regulatory minimums

## Risk Management

- ▶ Improves quality and flow of information for decision makers to enhance risk reward profile of entity
  - Approves risk policies, measurement and limits
  - Provides independent risk oversight; monitors risk bank-wide
  - Supports executive and management committees in decision making
  - Evaluates and assesses risks of new products

## Internal Controls

- ▶ Management control of day-to-day activities including:
  - Policies and procedures
  - Segregation of duties
  - Authorities and approval limits
  - Checking / verification procedures
  - Supervision of transactions and recording
  - Budget controls

# Risk management culture is important

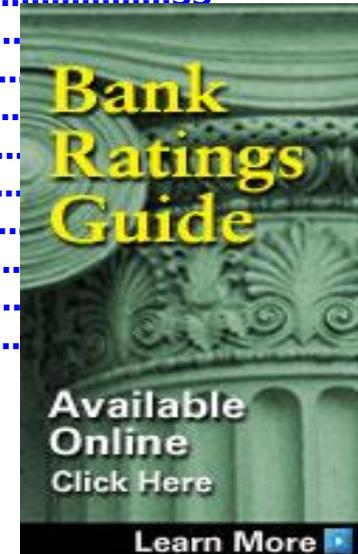
Most favorable factors	Least favorable factors
Governance structure supports effective risk management through board access, authority and management reporting relationships	Risk management has a purely advisory role, is solely response to regulatory requirements or is non-existent as a discipline
Company has clearly articulated risk tolerance consistent with goals and objectives and resources	Company's risk tolerance is unclear and seems to vary from situation to situation
Company risk management responsibility rests with an influential, high level officer	Company risk management responsibility rests with middle level officer or dispersed or non-existent
Risk management staff is highly and appropriately trained	Risk management staff are learning on the job
Risk management policies are clearly stated and widely known	Risk management policies are non-existent or not well documented

# Financial analysis is the backbone of risk assessment

- ❑ Use of financial analysis to assess level of risk
  - What are the key performance indicators
  - What are the exposure levels
  - What weight is applied to each
- ❑ Project future results (“what if” analysis)
- ❑ Effectively communicate risk issues with the entity
- ❑ Drives effective supervisory strategies

# S&P's *Bank Ratings Guide* includes bank-like financial institutions

FINANCIAL INSTITUTIONS.....	6
BANKS.....	8
BUSINESS TRUSTS .....	9
ASSET MANAGERS .....	11
BANKS.....	11
CREDIT UNIONS .....	51
EXCHANGES & CLEARING CORP .....	51
FINANCE COMPANIES .....	52
FINANCIAL INSTITUTIONS .....	55
AUSTRALIA .....	
FUNDS.....	
GOVERNMENT SPONSORED ENTERPRISES.....	
MORTGAGE INSTITUTIONS.....	
SAVING & LOANS COMPANIES .....	
SUPRANATIONAL.....	
COUNTERPARTY CREDIT RATINGS.....	
COUNTERPARTY CREDIT RATINGS.....	
SOVEREIGN .....	



# The major factors in the methodology are similar for all financial firms

- Economic Risk and Industry Risk
- Market Position and Diversification
- Management and Strategy
- Credit Risk and Market Risk
- Funding and Liquidity
- Capitalization
- Earnings
- Risk Management
- Financial Flexibility

# Risk ratings drive supervisory follow-up

- ❑ At some level, corrective action is triggered
  - MOU
  - Capital directive
  - Cease and Desist
  - Management change
- ❑ Rating can dictate appropriate response
- ❑ Follow-up is usually the responsibility of Relationship/Case Manager

# Risk ratings are linked to enforcement actions

Composite Risk Rating	Intervention Rating
Low	0 Normal
Moderate	0 Normal
	1 Early Warning
Above Average Risk	1 Early Warning
	2 Risk to financial viability/solvency
High	2 Risk to financial viability/solvency
	3 Future viability in doubt
	4 Not viable

Source: OSFI

SEADI is a joint project of the U.S. Agency for International Development and the Republic of Indonesia

# Early Warning Signs/System

# Early warning indicators should be monitored by off-site surveillance

- ❑ Establish benchmarks that are leading indicators of potential weakness
  - Current condition
  - Trend in financial performance
  - Comparison with peer group
- ❑ Use supervisory screens or econometric models to monitor
  - Downgrade
  - Probability of insolvency
  - Projected rating
  - High growth detection

# Example of early warning signals for Capital and Liquidity

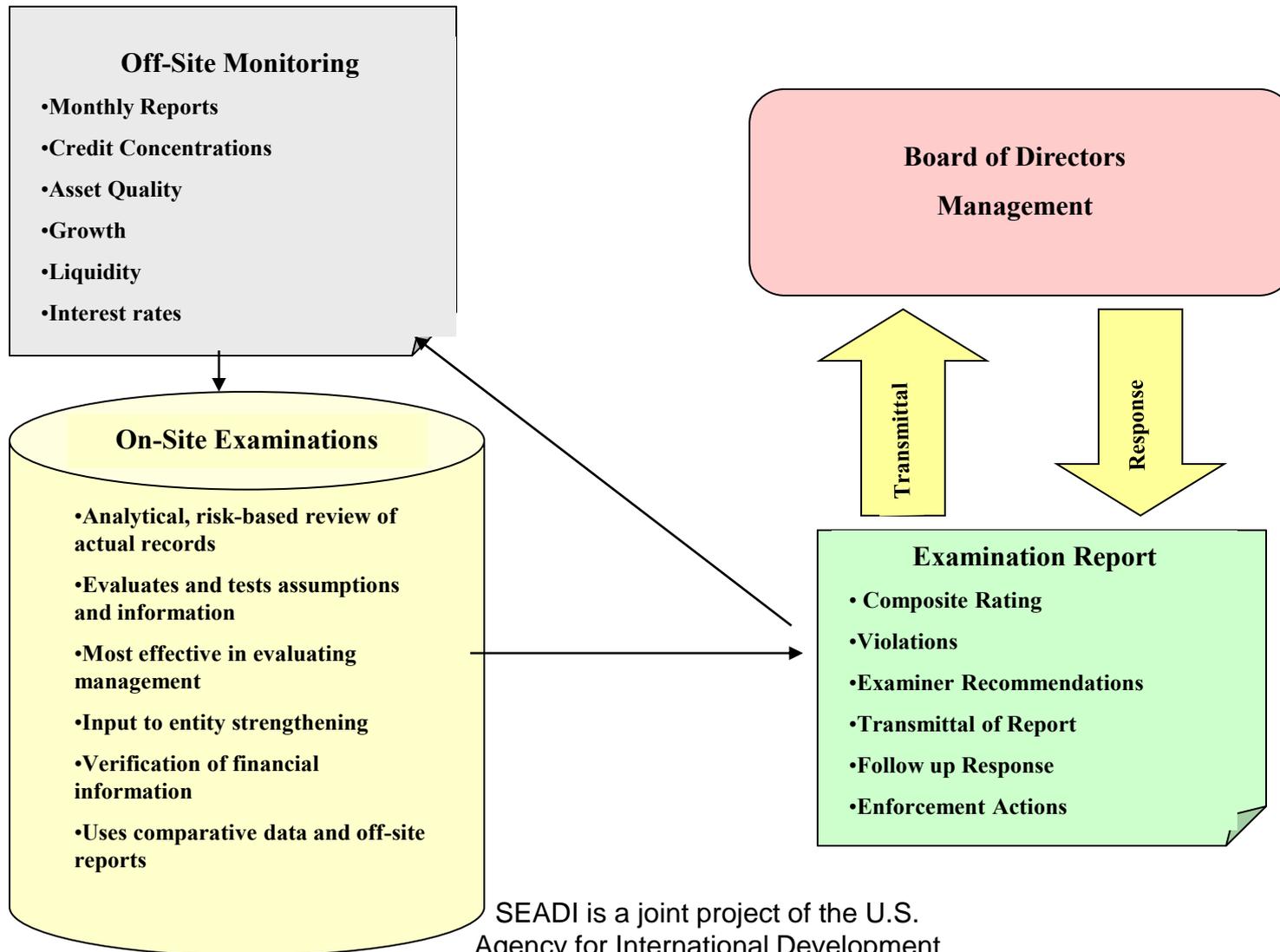
## □ Capital

- Growth in capital < growth in assets
- Increase in off-balance sheet activity
- Ratios significantly different than peer group

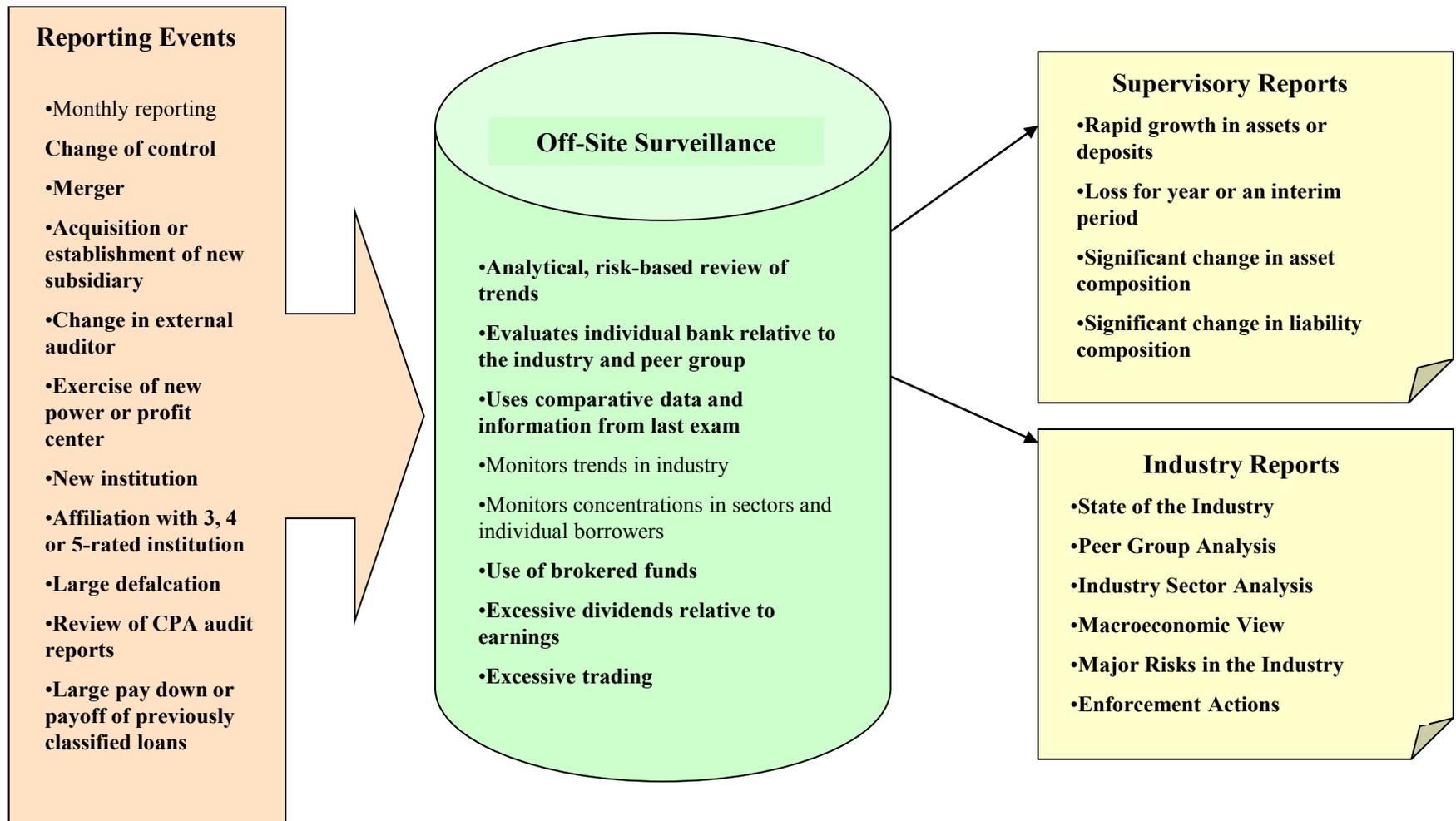
## □ Liquidity

- Increase in reliance on volatile funds
- Increase in borrowings
- Decrease in short-term investments
- Relatively higher interest rates paid than peer group

# On-site examinations begin the process



# Off-site surveillance is an important tool for supervisors



# Role of Qualitative Judgment and Discretionary Powers

# Risk rating systems depend on quantitative and qualitative measures

- ❑ Models only get you to the “right neighborhood”
  - Need expert judgment to get to right address
  - Preference for “A-rated people and C-rated model”
  - Use of models introduces “model risk”
- ❑ Institutional knowledge is critical
  - Understand risk strategy of the entity
  - Implementation of strategy and risk appetite is reflected in actual results
  - Permits reduction in “noise”

# Assessment of risk management strategies is not a checklist

- ❑ Needs to be appropriate to size and complexity of institution
  - Existence of policies means nothing without risk culture
  - Risk-adjusted performance should be consistent with staff incentives
- ❑ Best practices can be gleaned from the industry
  - Foreign institutions must conform to home office standards
  - Examination teams can provide on-the-job training

# Burden is on the entity to manage its own risks

- ❑ Burden is on the supervisor/examiner to evaluate how well the institution is managing its risks
  - Strict regulatory norms reduce the need for more appropriate policies at the institution
  - Institutional policies should be more restrictive
- ❑ Supervisor discretion can be used as a carrot
  - If risk management not adequate, increase required levels of capital/liquidity/provisioning/etc.
  - Increases need for supervisors to use judgment

# Risk Assessment Process: Credit Risk

# What is credit risk?

**“The risk that a borrower will not pay what was lent – in full and on time”**

**The potential that a counterparty will fail to meet its obligations in accordance with agreed terms**

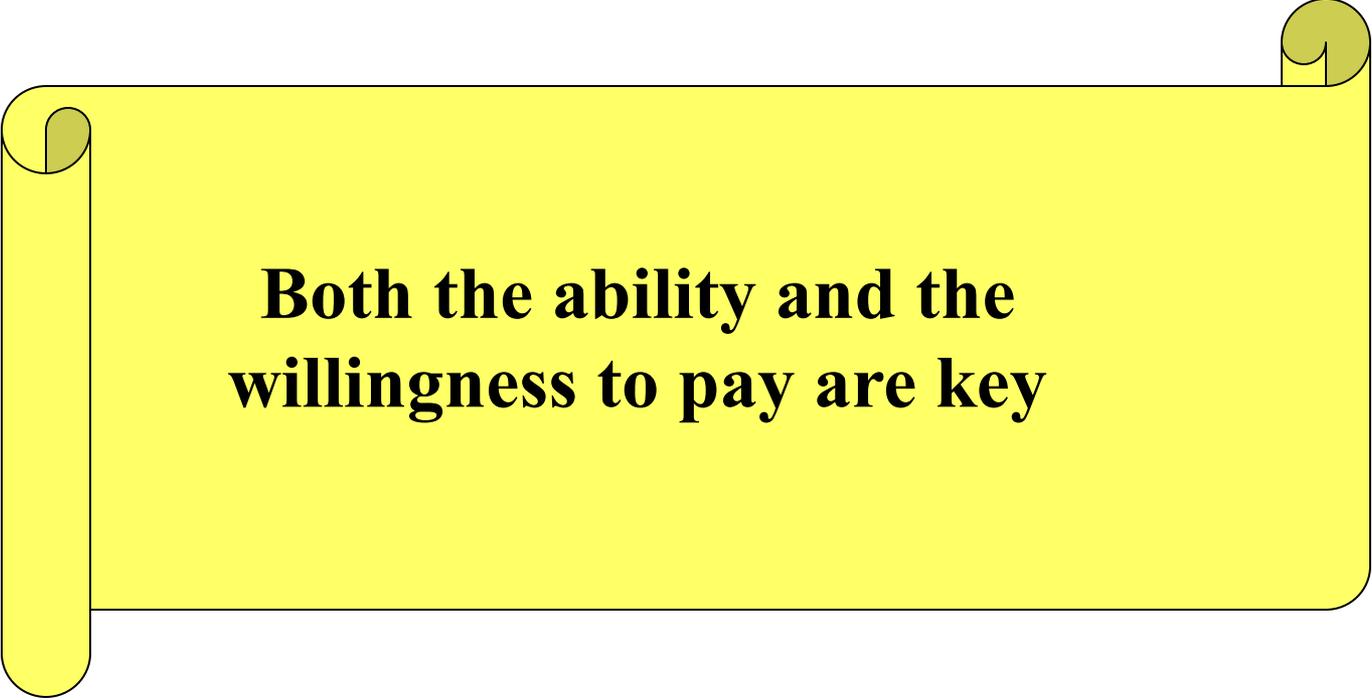
**“Principles for the Management of Credit Risk” - BIS 1999**

**Must also include *all* threats to value, in a probability / net present value sense; e.g. deterioration in quality throughout the life of the asset is a credit risk in itself**

# Risk measurement takes different forms

- ❑ Z Score
- ❑ Expert systems
- ❑ Credit scoring models
- ❑ Rating systems
  - CAMELS
  - Pass, OLEM, Substandard, Doubtful, Loss
  - Public bond ratings

# Credit analysis drives the credit risk assessment of all methods



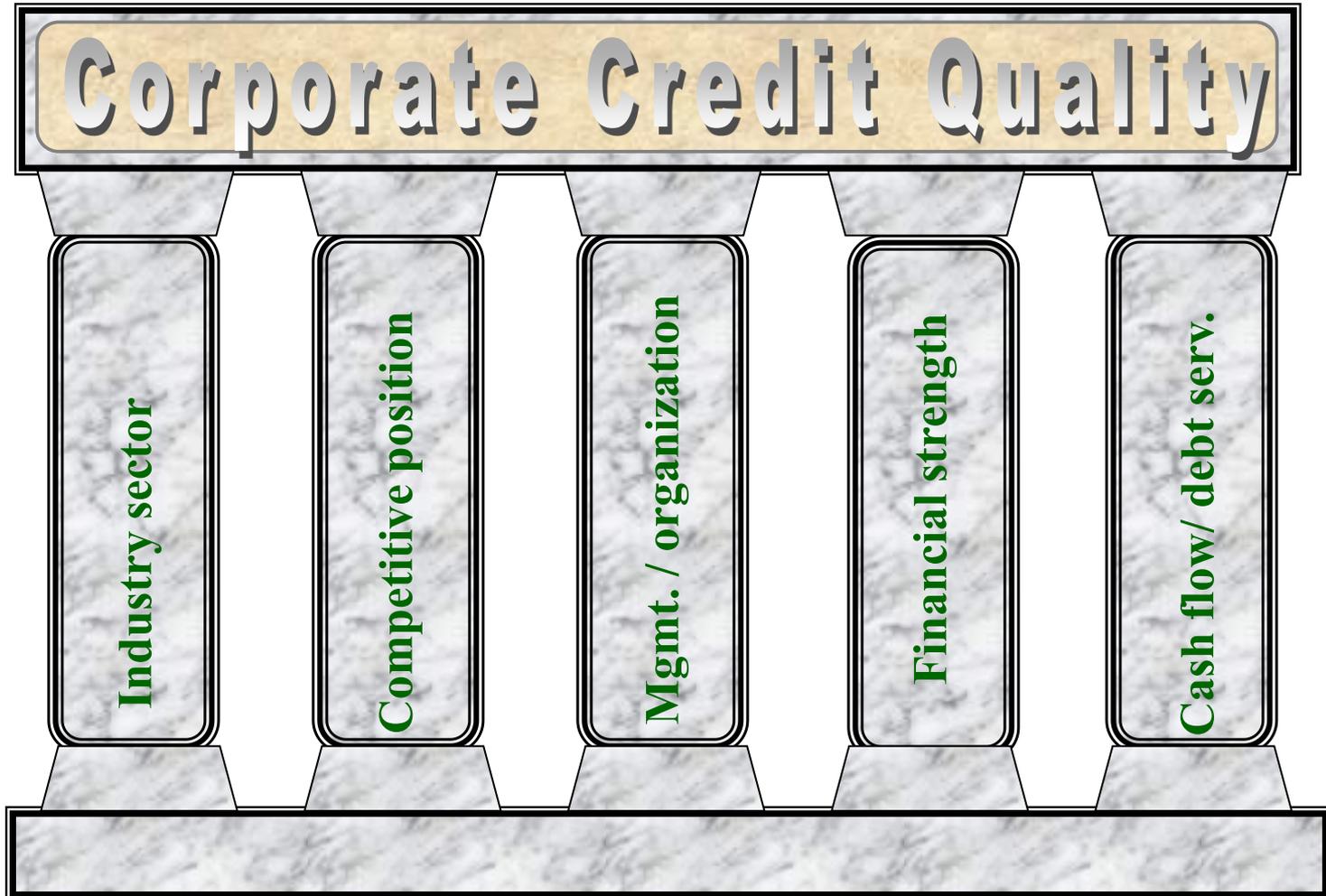
**Both the ability and the willingness to pay are key**

# There are two basic elements of credit risk

- ❑ Standalone risks
  - Default probability
  - Loss given default
  - Migration risk
- ❑ Portfolio risks
  - Default correlations
  - Exposure

Credit risk management means  
diversifying and transferring risk

# Standalone creditworthiness depends on many factors



# Data drives the credit analysis

Category	Data Required	Data Sources
Industry	<ul style="list-style-type: none"> <li>◆ Industry profile -- 3 years                             <ul style="list-style-type: none"> <li>◇ Size, growth</li> <li>◇ Concentrations</li> <li>◇ Cyclical/seasonality</li> <li>◇ Explanation of trends</li> </ul> </li> <li>◆ Industry outlook</li> <li>◆ Profiles of key competitors (top two)</li> <li>◆ Regulatory profile -- current, recent changes, expected changes</li> <li>◆ Borrower's strategy</li> <li>◆ Key alliances:                             <ul style="list-style-type: none"> <li>◇ With government</li> <li>◇ With private sector</li> <li>◇ With other influential players</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>◆ Internal                             <ul style="list-style-type: none"> <li>◇ Files</li> <li>◇ Research department</li> <li>◇ Other managers familiar with industry</li> </ul> </li> <li>◆ Third parties                             <ul style="list-style-type: none"> <li>◇ Ministries</li> <li>◇ Multilateral agencies -- World Bank, IADB, etc.</li> <li>◇ Other government organizations</li> <li>◇ Trade associations</li> <li>◇ Other banks</li> <li>◇ Other companies in industries</li> </ul> </li> <li>◆ External -- customer calls</li> <li>◆ Business press</li> </ul>
Financial Condition	<ul style="list-style-type: none"> <li>◆ Company financials -- 3 years                             <ul style="list-style-type: none"> <li>◇ Profit &amp; loss statements, balance sheets</li> <li>◇ Supplementary statements -- reconciliation of net worth, fixed assets\</li> <li>◇ Audited where possible</li> </ul> </li> <li>Creditor facilities                             <ul style="list-style-type: none"> <li>◇ Banks</li> <li>◇ Suppliers } amounts and condition of facilities</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>◆ Internal                             <ul style="list-style-type: none"> <li>◇ Files</li> <li>◇ Other managers familiar with borrower</li> </ul> </li> <li>◆ Issuer                             <ul style="list-style-type: none"> <li>◇ In person calls</li> <li>◇ Site visits</li> </ul> </li> </ul>

**SAMPLE DATA COLLECTION**

# There are two major factors to consider...

**What is the likelihood a borrower will default?**

**Probability [%]**

**If the borrower defaults, how much are we likely to lose?**

**Amount [IDR *or* %]**

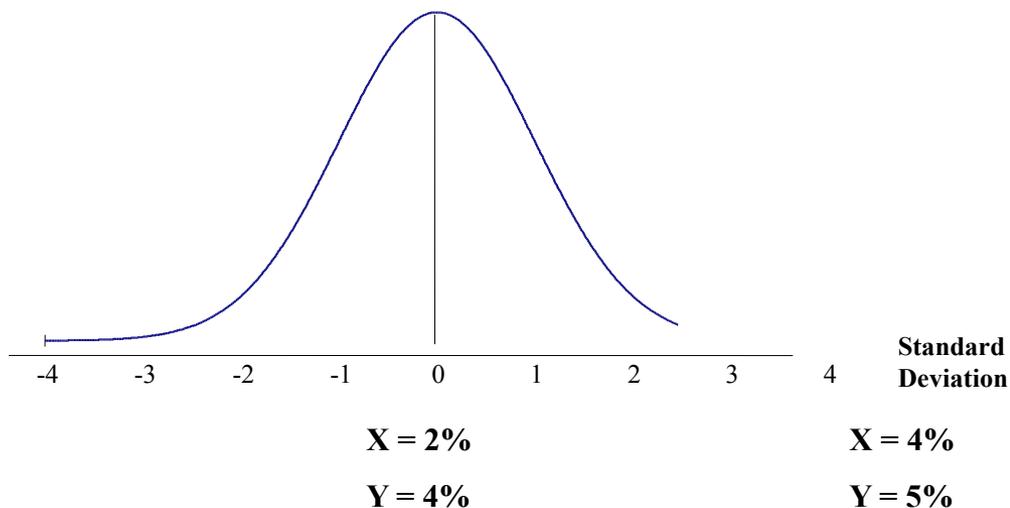
# BIS II has led to a new generation of statistical rating models

- ❑ Three measures for credit risk
  - Standardized using external ratings for risk weights
  - IRB: Foundation and Advanced
- ❑ IRB uses own rating systems with required features
- ❑ Provisions should equal expected loss where  $EL = PD * LGD * EAD$
- ❑ Capital must be held for UL

# Probability of Default (PD) is based on historical experience

**X Corporate Loans**

**Y Credit Cards**



# Databases of historical defaults are maintained by ECAIs

- S&P
- Moody's
- Fitch
- Dun & Bradstreet
- Others

# Supervisors assign ratings to risk weights for standardized

<i>S &amp; P RATING</i>	<i>MOODY'S EQUIVALENT</i>	<i>DEFAULT PROBABILITY (SUBSEQUENT YEAR)</i>
AAA	Aaa	0.01%
AA	Aa3/A1	0.03%
A	As/A3	0.10%
BBB	Baa2	0.30%
BB	Ba1/Ba2	0.81%
B	Ba3/B1	2.21%
CCC	B2/B3	6.00%
CC	B3/Caa	11.68%
C	Caa/Ca	16.29%

# Credit risk is managed with good policies and limits

- ❑ Structure of balance sheet, and composition of credit portfolio
  - Maturity
  - Loan type
  - Collateral
  - Concentrations
- ❑ Independent credit review
- ❑ Problem loans management
- ❑ Loan Loss reserves
  - Adequacy
  - Policy

Usually part of RMU

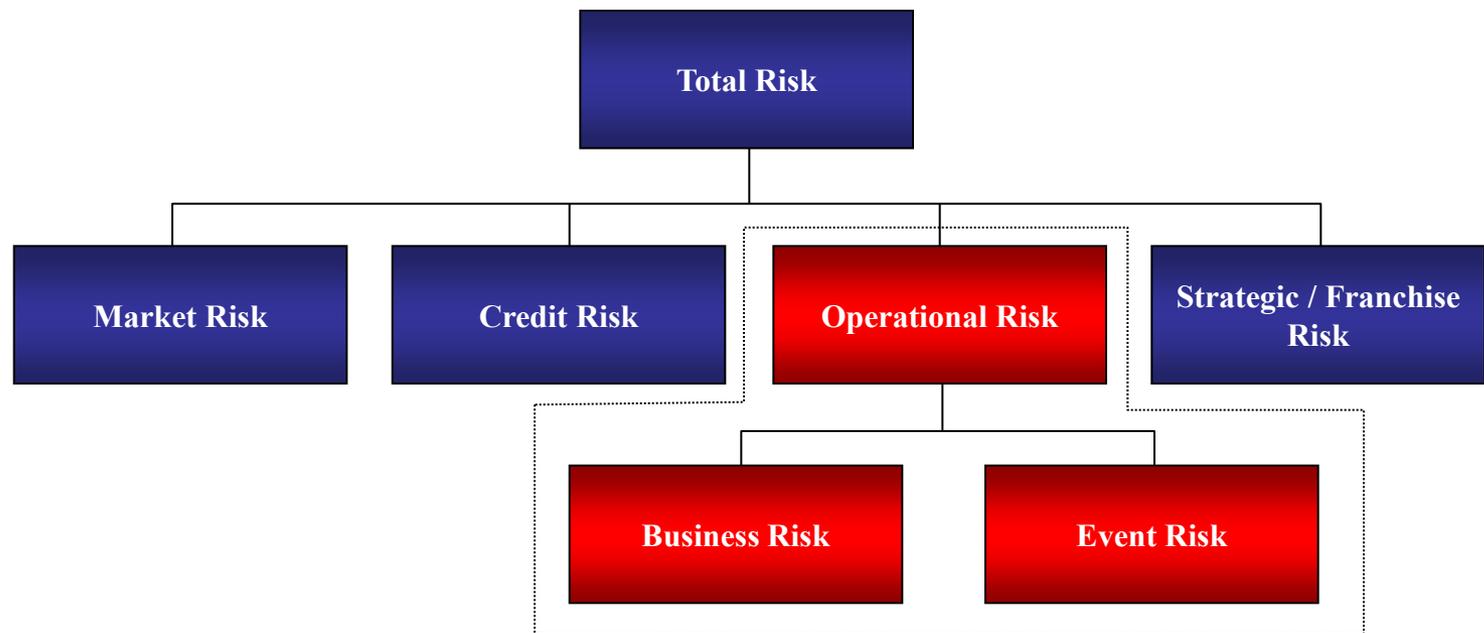
# Risk Assessment Process: Operational Risk

# What is Operational Risk?

Operational risk is defined as the risk of loss from inadequate or failed processes, people and systems or from external events. This definition includes legal risk but excludes strategic and reputational risk.

*BIS: International Convergence of Capital Measurement and Capital Standards: A Revised Framework*

# Operational risk is residual risk after credit and market risks



# Operational risks are classified as either “event” or “business” risks



# Operational risk: Fraud

## ❑ Internal Fraud

- Position misrepresentation
- Employee theft
- Insider trading on own account

## ❑ External Fraud

- Robbery
- Forgery
- Computer hacking

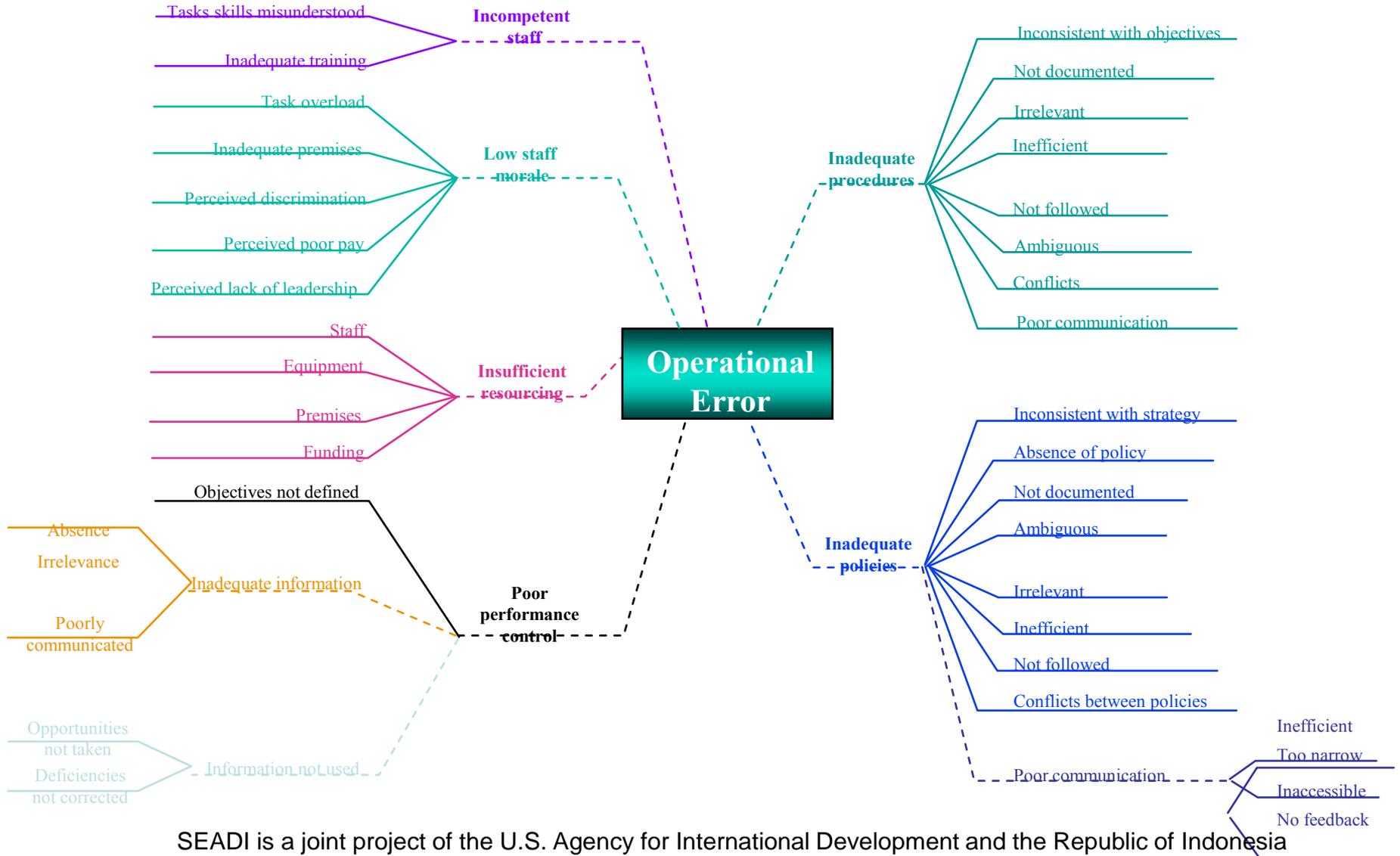
# Operational risk: Practices

- ❑ Employment Practices
  - Discrimination
  - General liability
- ❑ Clients, products and business practices
  - Fiduciary breaches
  - Misuse of confidential information
  - Improper trading
  - Money laundering
  - Sale of unauthorized products

# Operational risk: Damage

- ❑ Damage to physical assets
  - Terrorism
  - Vandalism
  - “Acts of God”
- ❑ Business disruption and system failure
- ❑ Execution, delivery and process mgt
  - Data entry
  - Collateral management
  - Incomplete legal documentation
  - Unapproved access to client records

# Risk Map



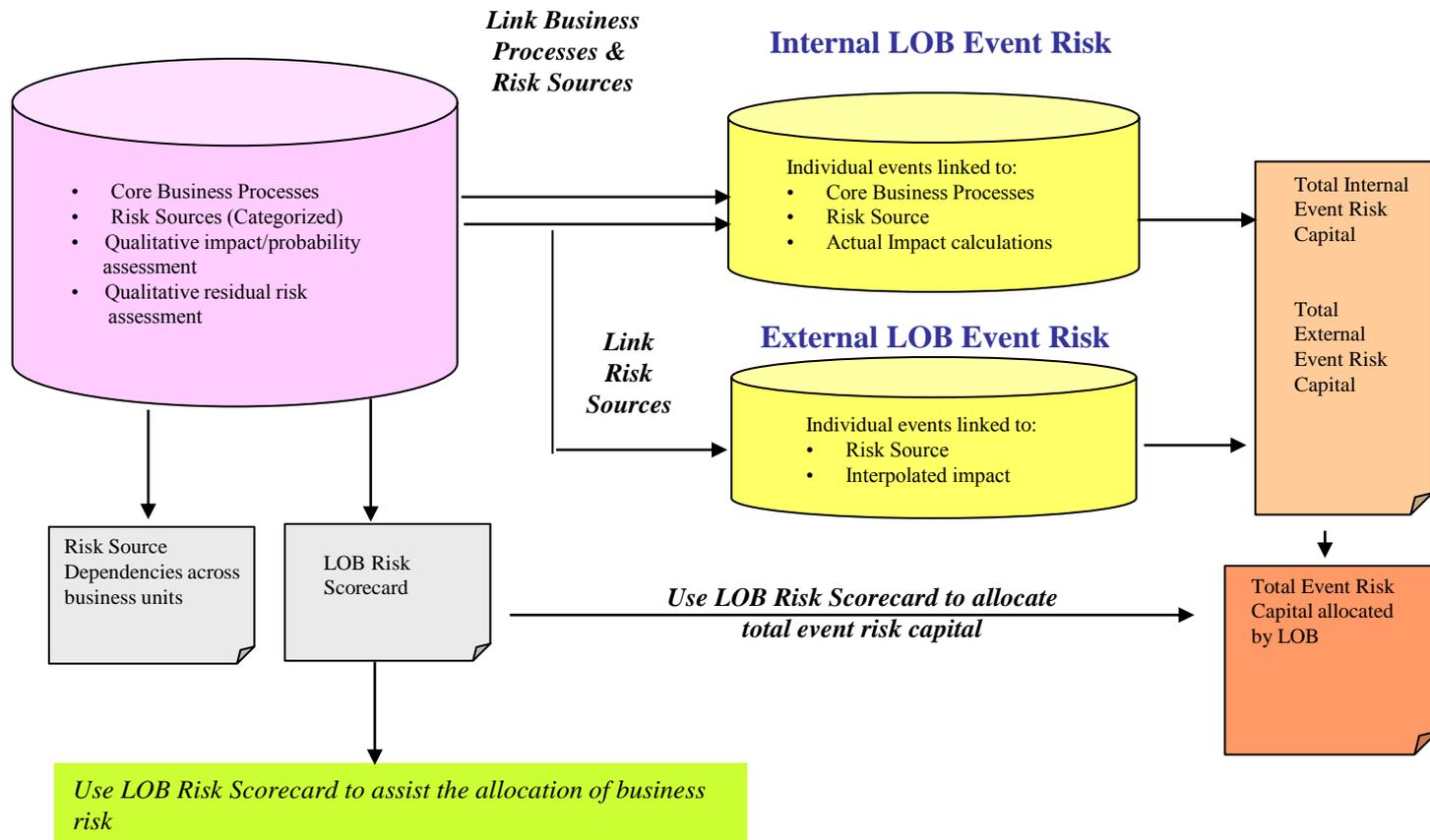
# However, there are more measurement challenges

- Limited pure market data
- Low probability/large loss
- Cause and effect
- Aggregation/Desegregation
- Market is not pricing
- Cost to control
- Component intuitively too small
- Exit costs

# Measurement is assessment of impact on earnings or capital

- ❑ High, medium and low ratings
- ❑ Two dimensions: Impact and likelihood
- ❑ For prioritization purposes, compress to one dimension
- ❑ For modeling purposes, need probability distributions

# Measurement of operational risk relies on risk database

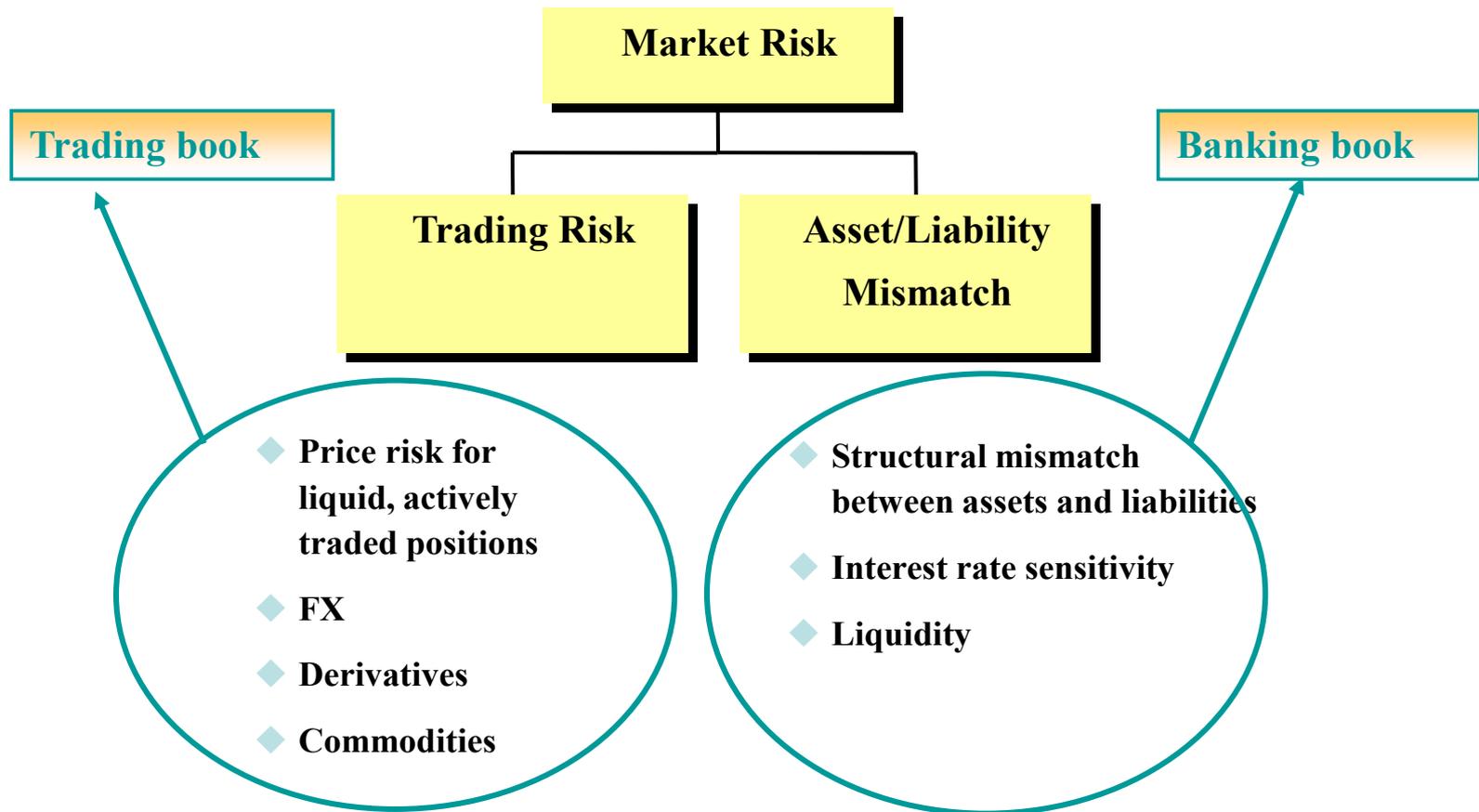


# Operational risk: Summary

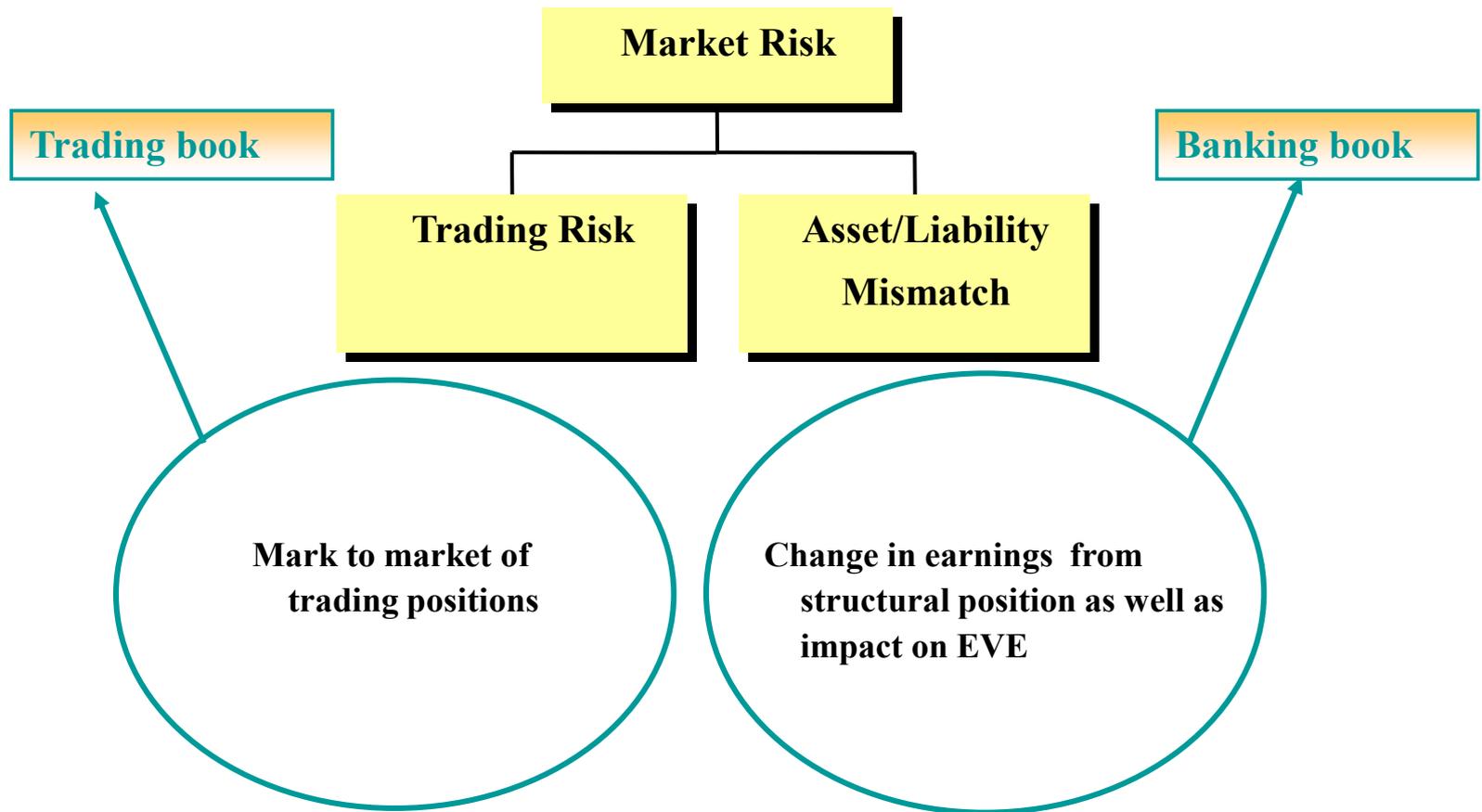
- ❑ High, medium and low ratings
- ❑ Two dimensions: Impact and likelihood
- ❑ For prioritization purposes, compress to one dimension
- ❑ For modeling purposes, need probability distributions

# Risk Assessment Process: Market Risk

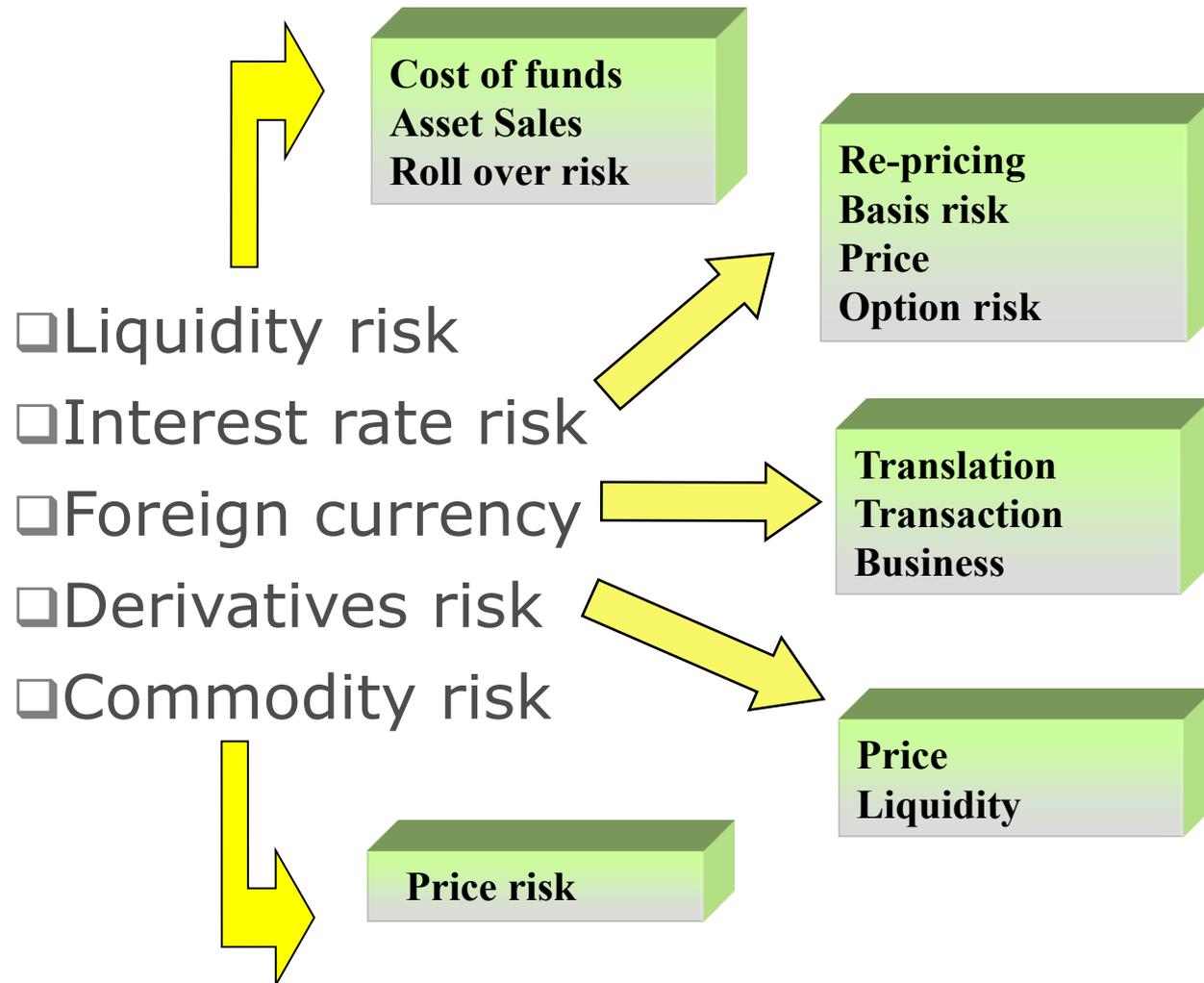
# Market risk typically is associated with trading and ALM activities



# Market risk is measured by impact on earnings and capital



# Market risk is volatility due to changes in rates/prices



# ALCO and Treasury manage market risks and capital



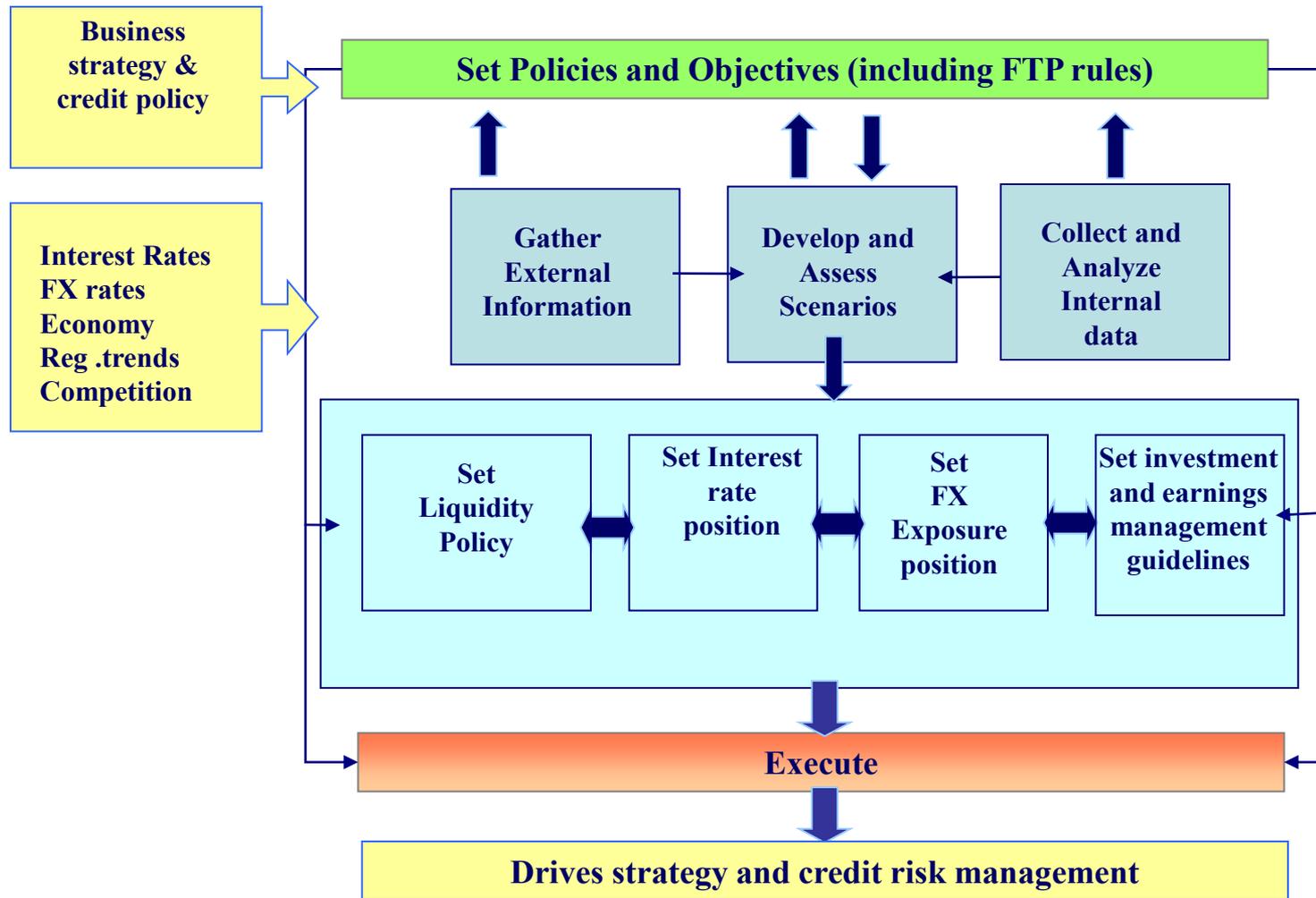
# ALM risks arise due to a mismatch between assets and liabilities

- ❑ Contractual differences between assets and liabilities
- ❑ Repricing differences
- ❑ Yield curve changes
- ❑ Exchange rates
- ❑ Customer preferences

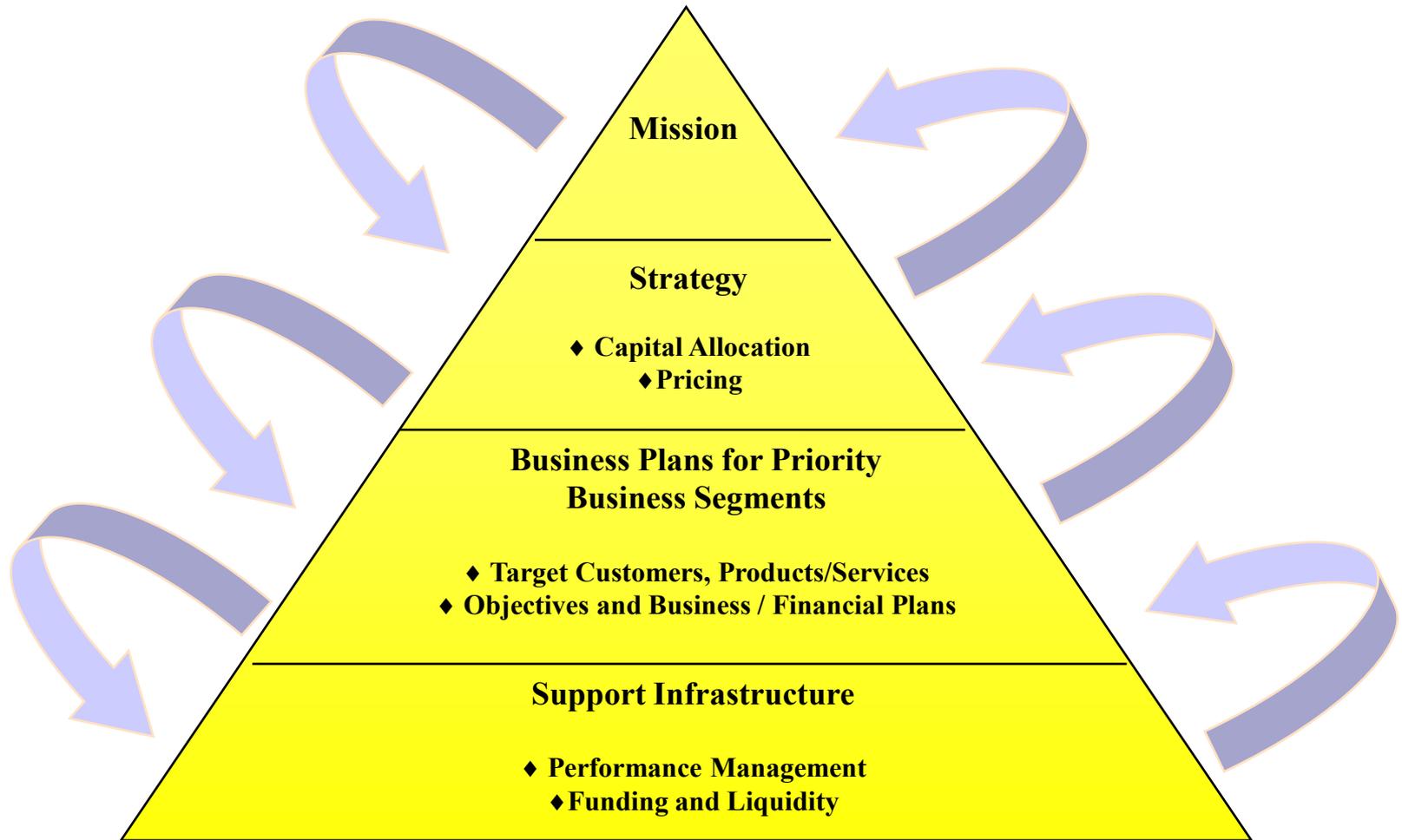
# ALM is the financial management of any intermediary

- ❑ Setting policies
- ❑ Allocating the balance sheet
- ❑ Structuring liabilities in terms of re-pricing and maturity schedules
- ❑ Hedging positions as necessary
- ❑ Budgeting capital
- ❑ Measuring internal profitability
- ❑ Contingency planning for unexpected changes in the environment

# ALM is an integrated function of strategic, profit and capital planning



# Strategy is the backdrop for any ALM policy



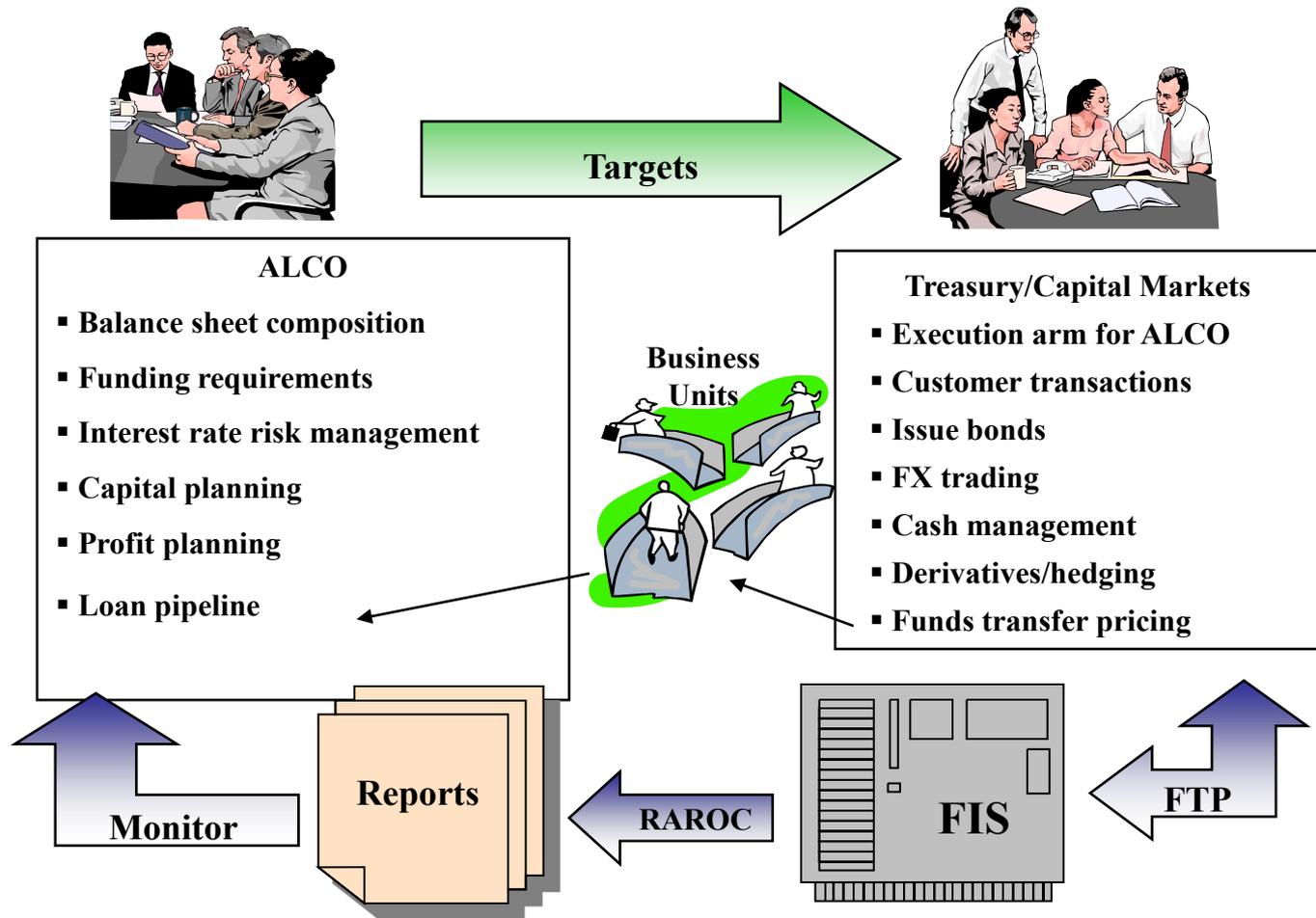
# ALM monitors and measures performance—how make the plan!

- ❑ Forecasts the balance sheet, cash flows and income statements
- ❑ Manages major non-credit financial risks in banking book
  - Liquidity risk
  - Interest rate risk
  - FX risk
- ❑ Measures sensitivity of earnings and capital to unexpected changes in variables
- ❑ ALM is both a bottom-up and top-down process: “Manage what you measure”

# ALM process should prevent “surprises”

Primary Responsibility	Information Provided	Source
Controller	Historical financial information and year-to-date results relative to the budget or annual financial plan	Accounting system/ Chart of accounts/ General ledger
Budgeting	Prepares budget or annual financial plan based on management’s target (growth, ROE, etc.)	Management Information system
ALM	Designs strategies to meet financial targets and provides roadmap of how to get there	Monitors reports, economic environment and other external factors

# ALM process manages the banking book usually through an ALCO



# The objectives are a predictable level of earnings and growth

## □ Financial Objectives

- Short-term: Net income
- Long-term: Market Value of Equity

## □ Balance Sheet Objectives

- Balance sheet growth targets
- Capital growth and dividends
- Markets served and markets ignored
- Product offerings and Pricing
- Desired image

# ALM process measures impact on target ratios and planned earnings



Market Value



Return on Equity

Return on Assets



Net interest margin



Capital Adequacy

Liquidity

Identify

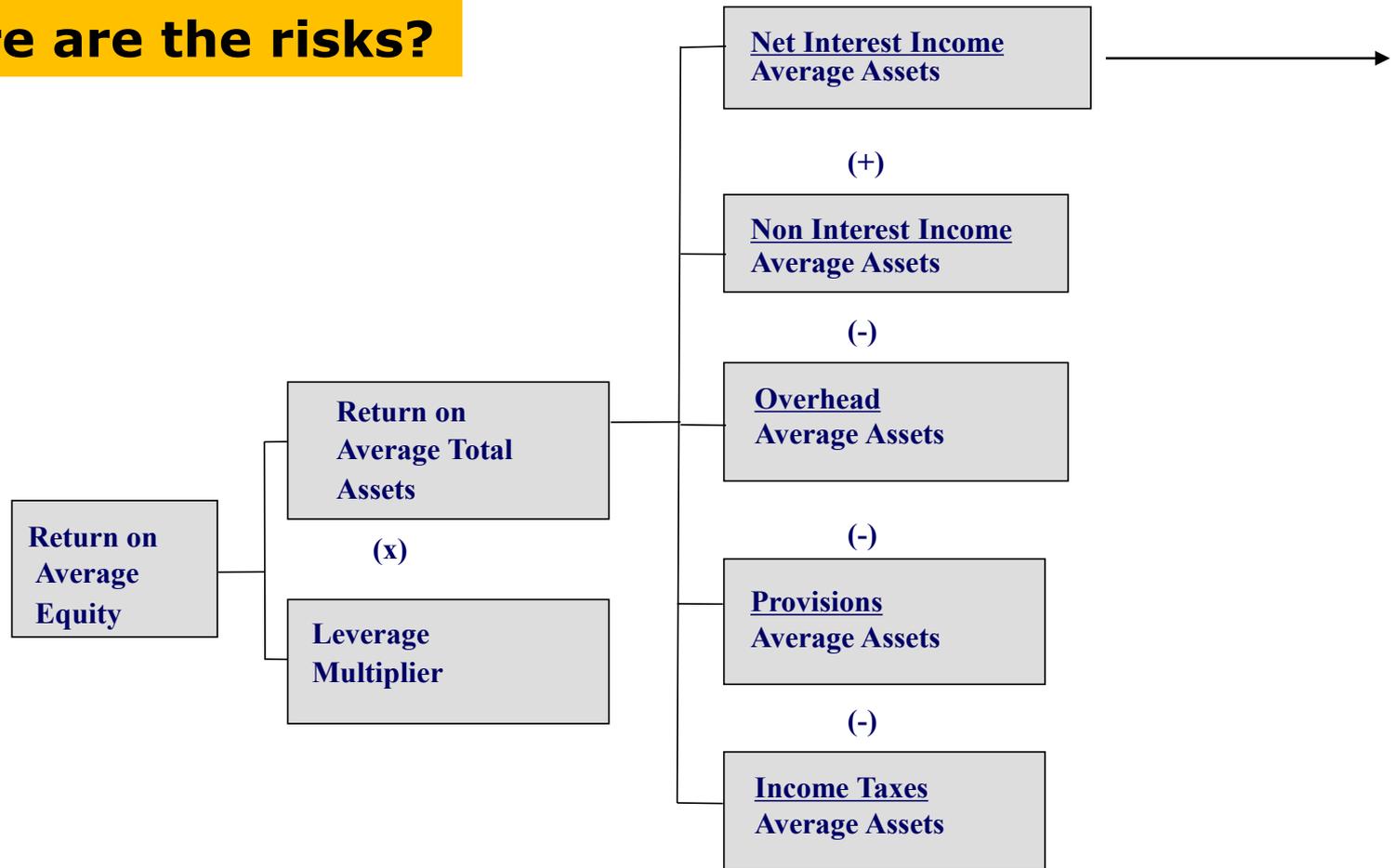
Measure

Manage

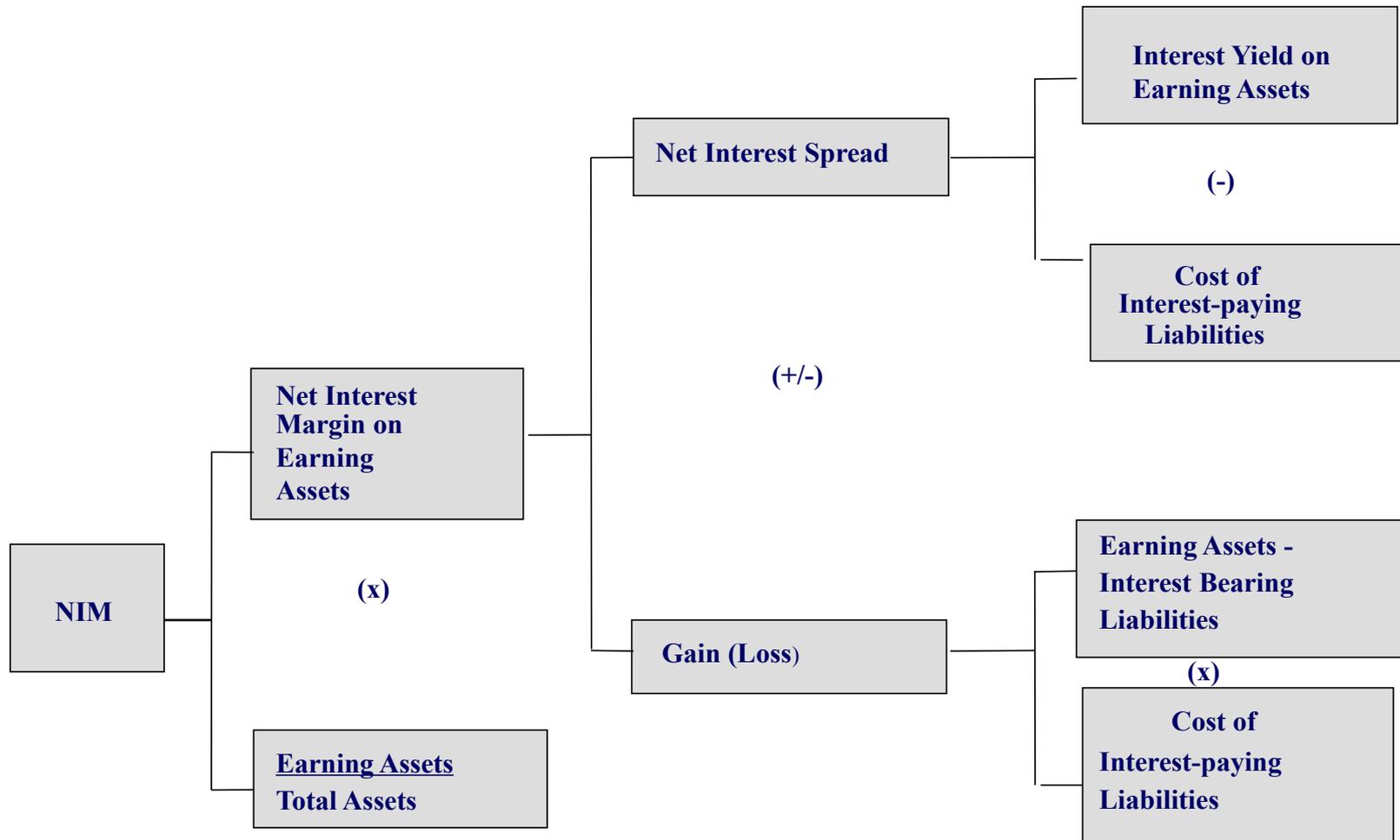
Monitor

# ALM seeks to maximize ROE within given risk limits

## Where are the risks?



# Net interest income is usually the most predictable source of earnings



# Interest margin objective worksheet starts the planning process

## Determined Required Return on Assets

Desired Return on Equity times Required Equity to Assets Ratio equals % Return on Assets

$$1 \begin{array}{|c|} \hline \text{ROE} \\ \hline \end{array} \times 2 \begin{array}{|c|} \hline \text{Capital Ratio} \\ \hline \end{array} = 3 \begin{array}{|c|} \hline \text{ROA} \\ \hline \end{array}$$

## Determined Required Net Income

Decimal Required Return on Assets Times Total Assets equals net income

$$3a \begin{array}{|c|} \hline \text{ROA} \\ \hline \end{array} \times 4 \begin{array}{|c|} \hline \text{Assets} \\ \hline \end{array} = 5 \begin{array}{|c|} \hline \text{Net Income} \\ \hline \end{array}$$

## Determining Interest Margin

Required Net Income plus operating expenses plus loan and security losses plus taxes

$$5 \begin{array}{|c|} \hline \text{Net Income} \\ \hline \end{array} + 6 \begin{array}{|c|} \hline \text{Operating} \\ \text{Expenses} \\ \hline \end{array} + 7 \begin{array}{|c|} \hline \text{Loan and} \\ \text{Security Loss} \\ \hline \end{array} + 8 \begin{array}{|c|} \hline \text{Taxes} \\ \hline \end{array}$$

Less fees equals desired margin

$$- 9 \begin{array}{|c|} \hline \text{Fees} \\ \hline \end{array} = 10 \begin{array}{|c|} \hline \text{Interest Margin} \\ \hline \end{array}$$

# Interest margin objective worksheet starts the planning process

## Determined Required Return on Assets

### Determine Required ROA

$$\begin{array}{rcl} \text{ROE x} & \text{Capital Ratio} = & \text{ROA} \\ 25\% & 12\% & 3.00\% \end{array}$$

### Determine Required Net Income

$$\begin{array}{rcl} \text{ROA x Total Assets} = & \text{Net Income} & \\ 3.00\% & 172,600 & 5,178 \end{array}$$

### Determine Interest Margin

$$\begin{array}{rcl} \text{NI + Overhead + Provisions + Taxes - Other Income (net)} & & \\ 5,178 & 10,798 & 6,246 & 1,460 & 8,542 \end{array}$$

**NIM**

$$\begin{array}{rcl} \text{Required Margin} & & 15,140 & 9.7\% \end{array}$$

$$\begin{array}{rcl} \text{Earning Assets} & & 156,337 \end{array}$$

1460

# Risk Assessment Process: Liquidity Risk

# What does “Liquidity” mean?

- ❑ Liquidity is the *ability* to meet all cash demands (payments, borrowing money, operational demands, etc.) anytime and entirely at a reasonable cost
  
- ❑ It is *not*
  - Cash or other types of assets
  - A ratio
  - Earnings

# What is Liquidity Risk?

Volatility in income or economic value due to an inability to meet cash needs for payments/withdrawals or to support growth in a timely and cost-effective manner.

# Liquidity risk arises from inability to obtain funding at reasonable cost

- Composition and maturity structure of liabilities
- Sources of funding
- Large funding held by any single group or individual institution
- Need to fund growth
- Seasonal or cyclical patterns

# Liquidity risk also arises from an inability to convert assets

- ❑ Inability to sell assets without incurring a loss
- ❑ Reduced inflows from maturing assets
  - Credit quality
  - Roll-overs
- ❑ Illiquid markets
- ❑ Mark to model assets

# There is a trade-off between liquidity vs. return

- ❑ Cash holdings provide no interest income
- ❑ Short-term assets normally carry lower yields
- ❑ Short-term borrowings normally carry lower interest rates
- ❑ Less liquid assets provide more income

# The key to liquidity risk management is planning

- ❑ Liquidity Plan has to accurately project all cash flows
- ❑ However, the longer the planning horizon, the more inaccurate the cash flow prediction
- ❑ Need for good data bases and communication systems to estimate future cash flows based on historical behavior
- ❑ Plan should include worst case scenario

# A Liquidity Policy addresses a number of variables

- ❑ Projected sources and uses of funds (minimum 90 days detailed projection)
- ❑ Typical limits and triggers include:
  - Maximum gaps in different time buckets
  - Minimum liquidity reserves
  - Loans/ Capital ratio or gearing ratio
- ❑ Limits on funding sources for diversification
- ❑ Stress tests (survive 30 days in extreme)
- ❑ Contingency Plan
  - Interest rate or FX shocks
  - Systemic risk

# Liquidity management can involve structuring maturities

2008	2009	2010	2011	2012	Beyond	Total
		\$32,051	\$32,051	\$32,051	\$224,360	
		\$22,482	\$22,482	\$22,482	\$97,016	
		\$25,174	\$25,174	\$25,174	\$176,223	
		\$22,482	\$22,482	\$22,482	\$157,378	
\$500,000						
	\$500,000					
			\$2,000,000			
			\$2,000,000			
			\$750,000			
\$666,000	\$1,334,000					
		\$750,000				
\$1,000,000						
\$666,666	\$666,667	\$666,667				
\$1,000,000						
	\$1,000,000	\$1,000,000	\$1,000,000			
\$2,000,000						
		\$1,000,000	\$1,000,000			
\$1,000,000						
\$6,832,666	\$3,500,667	\$3,518,856	\$6,852,189	\$102,189	\$654,977	\$21,461,544
31.8%	16.3%	16.4%	31.9%	0.5%	3.1%	100%

# Liquidity risk management is a daily responsibility

- Daily, weekly cash management
- Monitor balance sheet trends
- Forecast funding needs
- Identify alternative sources of funds
- Asset liquidity vs liability liquidity
- Stress testing
- Peer analysis

# Liquidity Risk Monitoring: Minimum MIS/Reports

- ❑ Liquidity gaps
- ❑ Sources of funds
- ❑ Maturity distribution
- ❑ Concentrations
- ❑ Volatile funds dependency
- ❑ Stress testing using assumptions of funding attrition
- ❑ Contingency plan

The image displays several overlapping spreadsheets, each containing a table with five columns labeled ABC, DEF, GHI, JKL, and MNO. The data is organized into rows, with some rows highlighted in different colors (pink, light blue, light purple). The tables appear to be variations of the same data set, possibly representing different time periods or scenarios. The data values are numerical, ranging from 1 to 25, and are arranged in a structured, grid-like format.

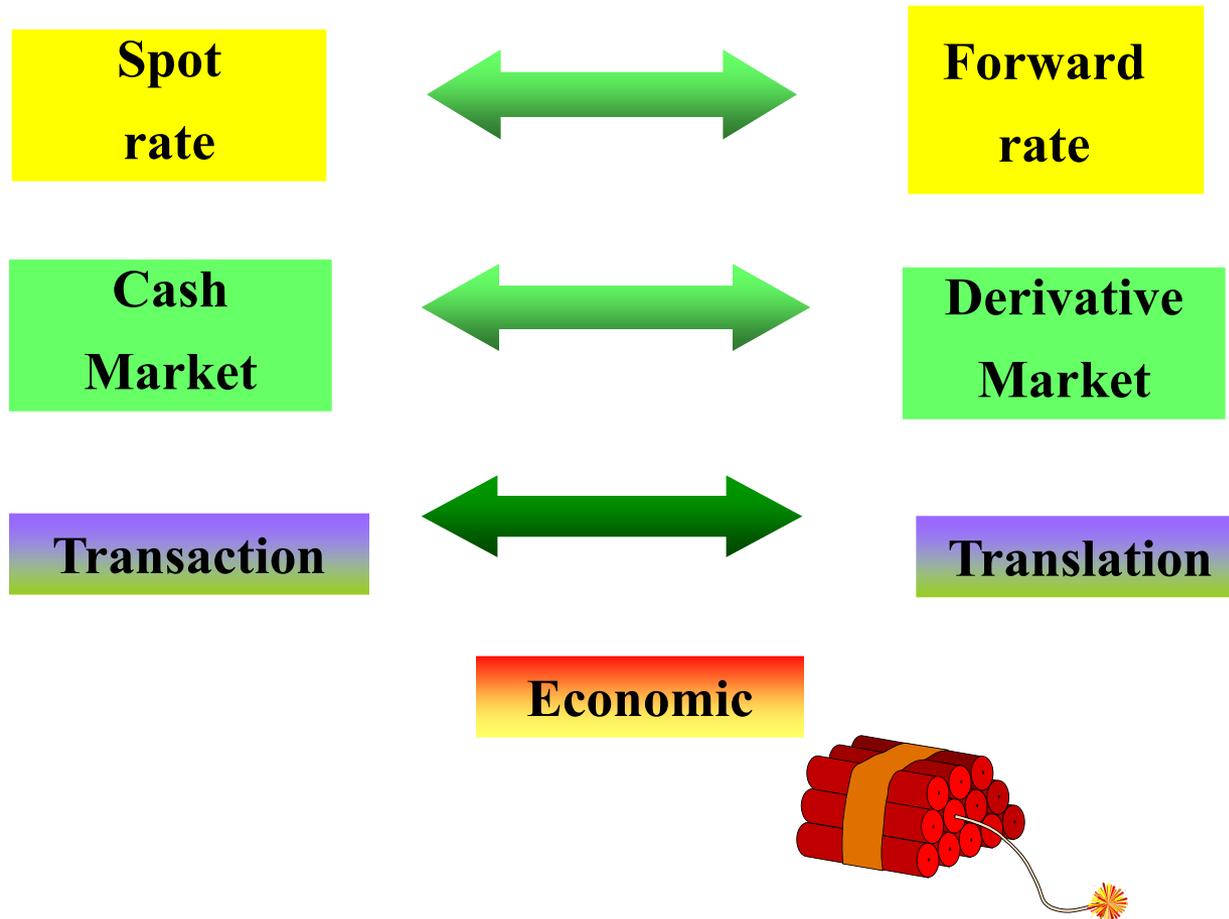
ABC	DEF	GHI	JKL	MNO
19	14	33	22	1
30	18	42	26	24
49	32	75	48	25
19	14	33	22	1
11	4	9	4	23
5	4	4	4	5
133	86	196	126	79

# In summary, several factors of bank liquidity risk management effectiveness

- ❑ Volume and composition of assets vs liabilities structure (incl. OBS)
- ❑ Volume and relative cost of funding
- ❑ Diversification of funding sources
- ❑ Absolute, trend and peer group analysis
- ❑ Contingency Planning
- ❑ Approved policies being implemented
  - Controls are in place
  - Timely and adequate MIS
- ❑ Level and skill of staff

# Risk Assessment Risk: Foreign Exchange Risk

# Foreign currency risk arises from movements in exchange rates



# FX risk comes in two forms

## **Translation risk:**

**Balance sheet assets and liabilities translated at FX rate prevailing on date of the balance sheet. Income statements translated at an average FX rate prevailing over the measurement period**

**Measures impact of a change in exchange rates on a company's financial statements**

## **Transaction risk:**

**Potential gains or losses on future settlements of outstanding obligations denominated in a foreign currency, ie., *booked sales may be paid in different actual amounts***

**Measures impact of a change in exchange rates on actual collections  
(the difference between receivables and payables)**

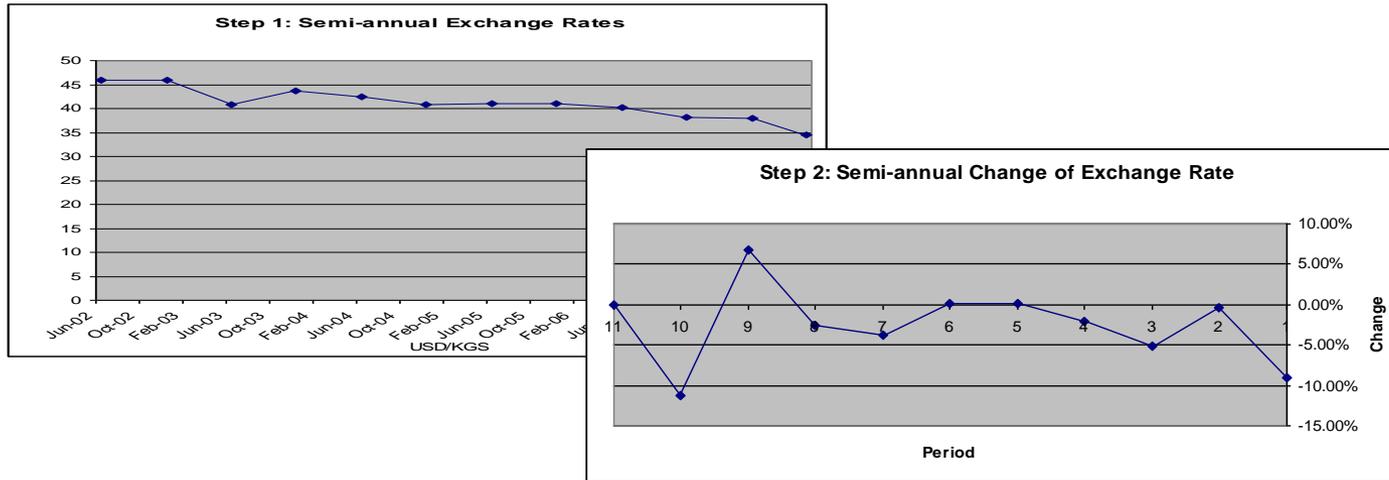
# FX risk arises from a mismatch of assets and liabilities

	ASSETS	LIABILITIES
Foreign currency appreciates	Gain	Loss
Foreign currency depreciates	Loss	Gain

# FX risk is measured like interest rate risk

- ❑ Foreign exchange gap analysis
- ❑ Foreign exchange duration analysis
- ❑ Foreign exchange rate simulation
- ❑ Rate volatility analysis

# Value at risk (VaR) is a common measurement tool



USD/KGS  $\sigma = 4.9\%$

VaR = Position x 2.33  $\sigma$  or 11.2%

# FX risk is managed with effective policies

- Objectives and principles of FX risk management
- Measurement of risk
- Risk exposure limits
- Net open position limits
- Currency position limits
- Stop-loss provisions
- Concentration limits
- Revaluation procedures

# FX risk management tools are available in some markets

## □ Contractual hedges

- Forwards
- Swaps
- Futures
- Options

## □ Natural hedges

- Payment leads and lags
- Matching

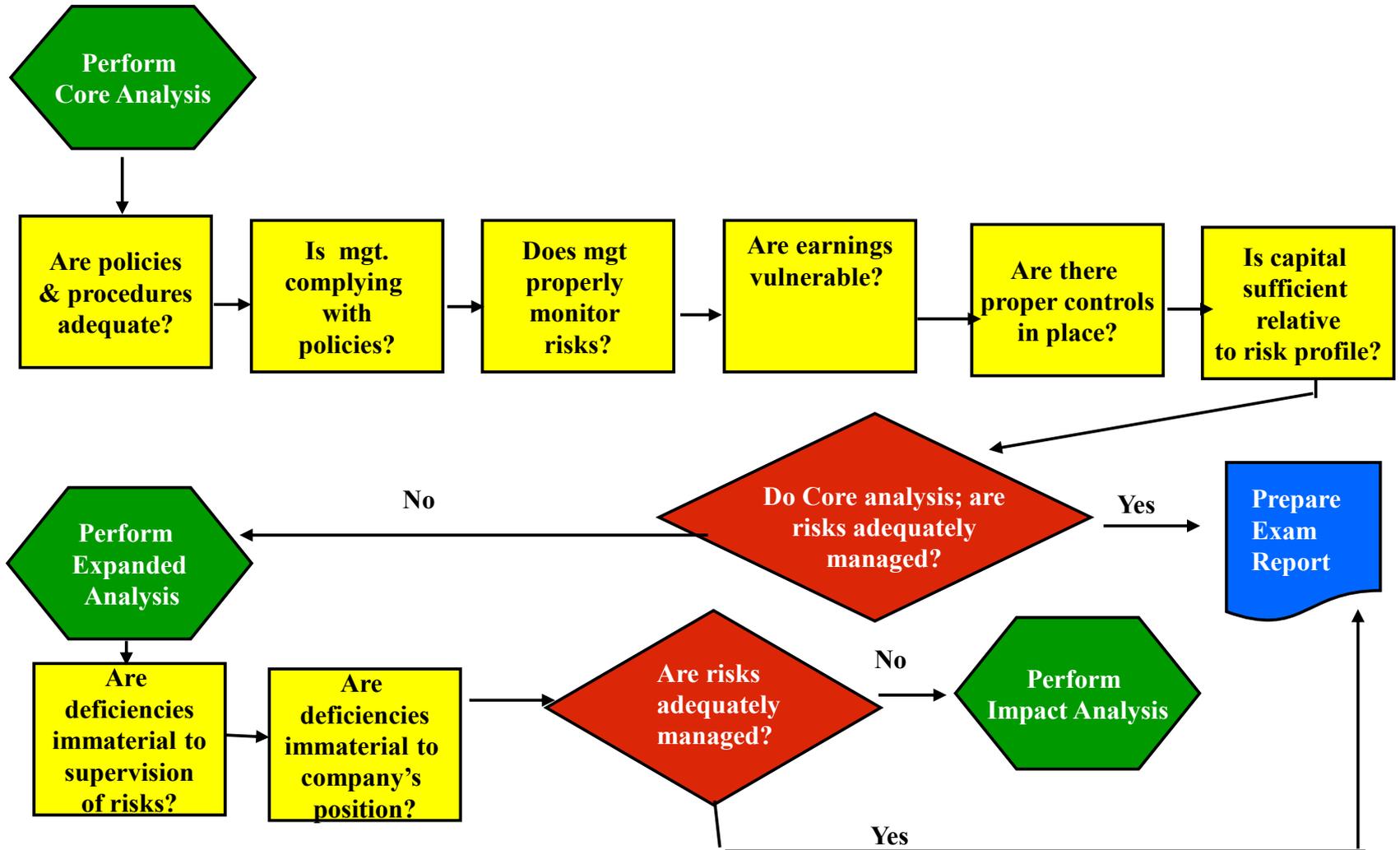
# FX risk reports monitor open positions

- Absolute
- Aggregate
- Net
- Value at risk
- Exchange rate trends
- Simulation

# Risks are interrelated

- ❑ Credit and market risks arise due to positions or balance sheet exposures
- ❑ There are operational risks associated with managing and reporting credit and market risks
- ❑ Breakdown in controls leads to increases in exposures
- ❑ Operational risks have direct costs
- ❑ Controls and risk management both have costs!

# Risk-based supervision should incorporate all risks faced by entities



# Case Studies

# Summary

- ❑ What is risk-based supervision?
- ❑ What role does it play in an effective supervisory framework
- ❑ How is risk assessment integrated into supervisory activities
- ❑ What is the risk assessment process
- ❑ Role of qualitative judgment and discretionary powers

# Steps in the transition to RBS



SEADI is a joint project of the U.S.  
Agency for International Development  
and the Republic of Indonesia

# Where are the gaps?

- ❑ What is your current supervisory framework (compare with effective framework; on-site inspection methodology and manual)?
- ❑ What is your institutional capacity to deliver RBS? (identify training needs, etc.)
  - Human/cultural
  - Information/Systems
- ❑ What is the capacity of entities in risk management? (introduce Guide)
- ❑ What is regulatory basis for risk based supervision (revise regulations and enforcement actions)

# Next steps

- ❑ Establish working group
  - Representatives from appropriate areas
  - Develop action plan and timeline
  - Assign responsibilities
- ❑ Develop survey for entities
- ❑ Coordinate with drafting of new regulations