10. Sensitivity to Market Risk: Principles, Indicators and Techniques

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Disclaimer

"The views expressed in the presentation may contain personal opinions and may not necessarily reflect the views of the Bangko Sentral ng Pilipinas (BSP) Management."

Learning Objectives

- Describe the basic principles of market risk
  - Define market risk
  - Identify the different sources of market risk
  - Differentiate the trading and banking books
  - Identify the different types of market risk and its sources
- Discuss market risk supervision
- Describe the risk assessment matrix
- Describe the "S" component of the CAMELS rating
- Identify the different supervisory tools used in assessing the "S" component

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Basic Market Risk Principles

Market Risk (definition)

- **Market risk** is the risk that movements in market rates, including foreign exchange rates, interest rates, equity and commodity prices will reduce the bank's income, capital, or the value of its portfolios.

Sources of Market Risk in the Balance Sheet

- Banks take market risk in two main areas of the balance sheet:
  - Trading Book
    - Typically has a short-term time horizon
    - Usually marked-to-market on a daily basis
    - Price risk is more "transparent" within a trading book
  - Banking/Accrual Book
    - Typically has a long-term time horizon
    - The banking book is usually not marked-to-market
    - Price risk is not as obvious as for a trading book

Impact of Market Risk

- Market risk can have an impact on:
  - Earnings*, by reducing income or increasing expenses due to adverse movements in market risk factors (e.g. reducing interest income from loan or increasing interest expenses)

    *eventually, will have impact on capital

  - Economic Value of assets, liabilities and OBS, since the present value of future cash flows or the cash flows themselves may change as the rates change.

Types of Market Risk

- Interest Rate Risk
- Foreign Exchange Risk
- Equity Price Risk
- Commodity Price Risk

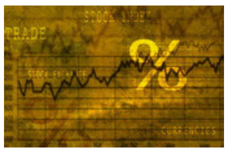
Source: Course F (CAMELS) - BSP SES PEPS Course

Interest Rate Risk (definition)

<u>Interest rate risk</u> is the inherent risk of adverse effects on earnings or capital arising from movements in interest rates.

Interest Rate Risk Sources

- All interest-bearing assets
  - Loans
  - Investment securities
  - Due from
- All interest-paying liabilities
  - Deposits
  - Borrowings
  - Due to
- Off-balance sheet items -
  - commitments, guarantees, L/Cs…with stated interest rates



Interest Rate Risk Components

- Repricing Risk
- Basis Risk
- Yield Curve Risk
- Option Risk

Source: Course F (CAMELS) - BSP SES PEPS Course

FX Risk (definition)

<u>Foreign exchange risk</u> is the inherent risk to earnings or capital arising from movements in foreign exchange rates.

Exposure to this risk mainly occurs during a period in which the credit institution has an <u>open</u> position, either on- and off-balance sheet, and/or in spot and forward markets.

FX Risk Sources

- **All FX* assets**
- **All FX* liabilities**
- **All FX* commitments or hedging positions**

***FX-denominated or FX-indexed**

FX Risk Sources

<u>FX Assets</u>

- Foreign currency
- Due from foreign correspondents
- Loans
- Investments
- Other assets

<u>FX Liabilities</u>

- Foreign currency deposits
- Due to foreign correspondents
- Borrowings
- Other Liabilities

OBSI: FX-denominated commitments, forward contracts, swaps, guarantees, and other obligations

FX Risk Types

- Transaction Risk
- Exchange Risk
- Translation Risk

Price Risk (definition)

Price risk means the inherent risk of negative effects on earnings or capital due to adverse changes in the **values** of financial instruments and other investments or assets owned by the bank or any of its subsidiaries, whether on- or off-balance sheet, as a result of changes in market **prices or values**.

Price Risk Sources

- Gold and precious metals
- Other commodities and commodity-linked items
- Fixed-rate investment securities
- Equity positions; Investments in other companies
  - Traded: market value available daily
  - Non-traded: market value needed periodically

Market Risk Supervision

Why the emphasis on market risk?

Supervision of market risk is increasingly more important…Why?

Source: Course E.2 (Market Risk) – BSP SES PEPS Course

Principle 22 – Market Risks
Core Principles for Effective Banking Supervision

- The supervisor determines that banks have an adequate market risk management process that takes into account their risk appetite, risk profile, and market and macroeconomic conditions and the risk of a significant deterioration in market liquidity.

- This includes prudent policies and processes to identify, measure, evaluate, monitor, report and control or mitigate market risks on a timely basis.

Principle 23 - IRRBB
Core Principles for Effective Banking Supervision

- The supervisor determines that banks have adequate systems to identify, measure, evaluate, monitor, report and control or mitigate interest rate risk in the banking book on a timely basis.

- These systems take into account the bank's risk appetite, risk profile and market and macroeconomic conditions.

Sensitivity to Market Risk

- The degree to which changes in interest rates, foreign exchange rates, commodity prices or equity prices can adversely affect a financial institution's earnings or capital

Source: FDIC

Sensitivity to Market Risk

- Rated by assessing:
  - Market risks taken by the institution
  - Management's capability to identify, monitor, measure and control said risk
  - Financial protection provided by earnings and capital

Assessing Quantity of Market Risk and Quality of Market Risk Management System

QUALITY of Risk Management	QUANTITY of Risk		
	Low	Moderate	High
	AGGREGATE RISK ASSESSMENT		
Weak	Low or Moderate	Moderate or High	High
Acceptable	Low	Moderate	High
Strong	Low	Low or Moderate	Moderate

Source: Course F.2 (Market Risk) – BSP SES PEPS Course

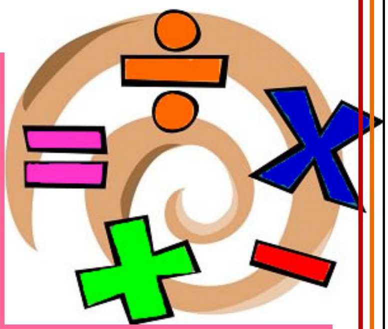
Quantity of Market Risk

Primary Factors to Consider:

- Actual and prospective level of market risk within the banking book
  - Balance sheet structure and resulting exposure to market risk
  - Volume, types, diversity and complexity of products/positions
  - Interest rate risk positions (short and long-term horizons)

Source: Course F (CAMELS) - BSP SES PEPS Course

Quantity of Market Risk



Primary Factors to Consider:

Key market risk indicators/ratios

- Cumulative Gap between RSL /total earning assets (per time band)
- Repricing assets/repricing liabs (each time bucket)
- Net interest income/ave. earning assets
- Modeling results

Source: Course F (CAMELS) - BSP SES PEPS Course

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Quantity of Market Risk

Primary Factors to Consider:

- Actual and prospective level of market risk within trading book
  - Size, tenor and complexity of open positions
  - Size and stability of trading revenues
  - Size of open positions versus revenues generated and expected
  - Vulnerability under various scenarios and the ability to close or exit positions at reasonable cost and in a reasonable timeframe

Source: Course F (CAMELS) - BSP SES PEPS Course

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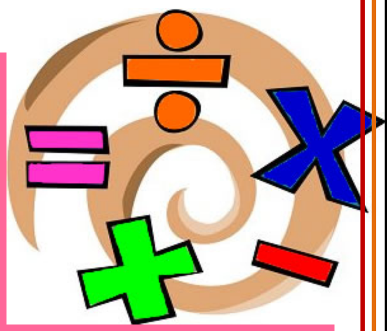
Quantity of Market Risk



Primary Factors to Consider:

Key market risk indicators/ratios

- Net open FX position/regulatory Capital
- Market value/carrying value of equities, commodities or fixed rate instruments.
- Trading gains or losses/ave. trading assets
- Modeling results

Source: Course F (CAMELS) – BSP SES PEPS Course

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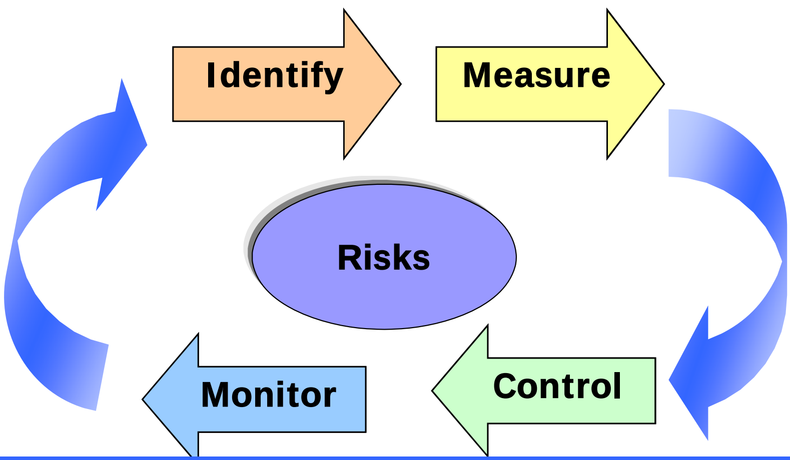
Quality of Risk Management



Risk Management – A Dynamic Process

Source: Course F (CAMELS) - BSP SES PEPS Course

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QUALITY of Market Risk Management System
Primary Factors to Consider

Board and Senior Management Oversight	1
Market Risk Policies, Procedures and Limits	2
Measurement, Monitoring and Management Information System	3
Internal Audit and Controls	4

Source: Course F (CAMELS) - BSP SES PEPS Course

QUALITY of Market Risk Management System
Primary Factors to Consider

Board and Senior Management Oversight 1

- Is aware of all major sources of market risk exposure and understands the complexity and level of risk
- Understand how those risks affect current operations and strategic plans
- Approve the overall policies of the bank and ensures that management takes the steps necessary to identify, measure, monitor and control these risks

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QUALITY of Market Risk Management System

Primary Factors to Consider

Board and Senior Management Oversight 1

Market Risk Policies, Procedures and Limits 2

- Policies and procedures are sound, appropriate to scope of operations and communicate guidelines for the management of market risk, functional responsibilities and tolerances for risk
- Limit structure provides clear parameters for risk under a variety of defined and reasonable Scenarios
- Earnings and capital commensurate to the actual and prospective level of risk exposure

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Source: Course F (CAMELS) - BSP SES PEPS Course

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QUALITY of Market Risk Management System

Primary Factors to Consider

Board and Senior Management Oversight 1

Market Risk Policies, Procedures and Limits 2

Measurement, Monitoring and MIS 3

- For non-complex banks: single currency
  - Re-pricing Gap Analysis
- For large banks with complex, multi-currency balance sheets:
  - Value-at-Risk (VaR) for risk in the trading book
  - Earnings-at-Risk (EaR) and Economic Value of Equity (EVE) for risk in the banking book

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Source: Course F (CAMELS) - BSP SES PEPS Course

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QUALITY of Market Risk Management System

Primary Factors to Consider

- Board and Senior Management Oversight 1
- Market Risk Policies, Procedures and Limits 2
- Measurement, Monitoring and MIS 3
- 4
  - Additional considerations for complex banks
    - Reliable monitoring and measurement systems
      (Appropriate, adequately documented, independently validated, periodically back-tested)
    - Periodic stress testing
      (Comprehensive, adequately documented, results reported to BOD)


Source: Course F (CAMELS) - BSP SES PEPS Course

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QUALITY of Market Risk Management System

Primary Factors to Consider

- Board and Senior Management Oversight 1
- Market Risk Policies, Procedures and Limits 2
- Measurement, Monitoring and MIS 3
- 4
  - Additional considerations for complex banks …
    - Competency of middle office personnel & internal audit
    - Reports to the BOD and Senior management
      (Timely, concise, actual exposures and exceptions identified)


Source: Course F (CAMELS) - BSP SES PEPS Course

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QUALITY of Market Risk Management System
Primary Factors to Consider

- Board and Senior Management Oversight 1
- Market Risk Policies, Procedures and Limits 2
- Measurement, Monitoring and MIS 3
- Internal Audit and Controls 4

Model Risk

- Independent validation of methodologies, including input process, assumptions and system output reports
- Level and depth of independent review should be commensurate with the bank activities

Source: Course F (CAMELS) - BSP SES PEPS Course

QUALITY of Market Risk Management System
Primary Factors to Consider

- Board and Senior Management Oversight 1
- Market Risk Policies, Procedures and Limits 2
- Measurement, Monitoring and MIS 3
- Internal Audit and Controls 4

Controls

- Should ensure the integrity of the market risk management process
- Should promote effective and efficient operations, reliable financial reporting and compliance with institutional policies and relevant regulations

Assessing the Direction of Risk

The level and direction of risk can be derived from:

- The overall size and complexity of the organization and its risk management structure;
- The type of activities the institution engages in;
- An analysis of the institution's financial condition and trends;
- Bank strategies and business plans;
- Track record of bank management; and
- Market environment

Source: Course F (CAMELS) - BSP SES PEPS Course

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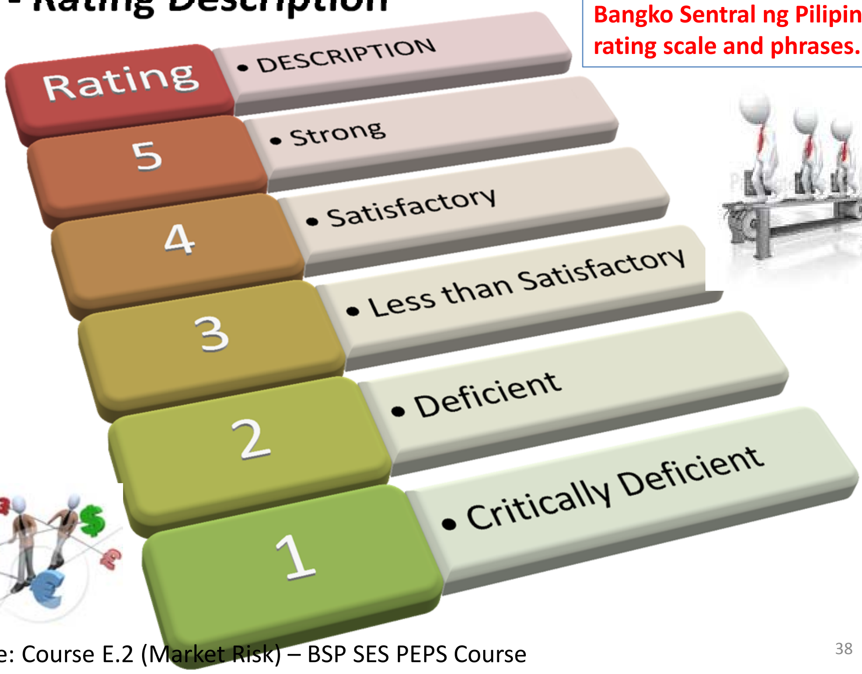
CAMELS RATING – S is for Sensitivity to Market Risk - Rating Description

Bangko Sentral ng Pilipinas' rating scale and phrases.



Source: Course E.2 (Market Risk) – BSP SES PEPS Course

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Summary of Key Indicators Used to Assess the "S" component

Sensitivity to Market Risk	
Net interest income/average earning assets (AEA)	Bonds Payable /Total Assets (TA)
Interest income/AEA	Unsecured subordinated debt/TA
Non-interest income/Ave. assets (AA)	Interest Income/AA
Net unrealized gain/(loss) on Available for sale (AFS) securities	Interest Expense/AA
Trading gains or losses/average trading assets	Net Interest Inc.(Exp)/AA
Securities gains (AFS or Held to maturity securities)/AA	Yield data
FX Profits or Loss /AA	Balance sheet gaps

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Sensitivity to Market Risk	
Primary sources of market risk as a percentage of total assets	Net positions and cumulative positions per time band
Deposit liabilities/Total Assets (TA)	All types of derivatives as % of TA
Long-term negotiable certificates of deposits/TA	Ave. earnings assets/ave. costing liabs.
Bills Payable /TA	Net unrealized gains/losses on AFS securities/AFS securities
Non-interest income – fees and commissions (as % of pre-tax operating Income)	Cumulative gap/TA (per time band)

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