

Risk Management and Bond Portfolio Management

Part I : Financial Risks

Understanding and Definition

THE IMPORTANCE OF FINANCIAL RISK MANAGEMENT

❑ 2008-2009 Financial crisis

- Collapse of housing prices → subprime crisis**
- Massive unemployment**
- Spread of distress throughout financial markets and economies around the world**

❑ Major causes

- individuals and financial institutions borrowed at unprecedented level → into housing/real estate assets, in particular**
- leverage ratios at financial institution are far too dangerous: 30:1 leverage ratios**
- Falling in value of MBSs, ABSs, CDOs, etc**

VIETNAM FINANCIAL CRISIS 2008-2009

❑ Foreigners' capital withdrawals

- massive sales off for Vietnam assets : loans and bonds**
- USD buying for home repatriation**

❑ Instability of eco macro indexes

- inflation increased rapidly to 20%++**
- US\$VND reached unprecedented level**
- VN index lost and drop to bottom**

❑ Consequences of the crisis: financial panic

- Equity & bond investor losses**

>>>How to manage the exposure ? <<<

RISKS

❑ **What is Risk?**

Risk is uncertainty that adversely affects the performance of a company.

Risk =====> Risk of Loss

❑ **Types of Risks**

- ❖ Financial risk
- ❖ Business risk
- ❖ Political risk
- ❖ Other risks

FORMS OF RISKS

Financial Risk	<ul style="list-style-type: none">• Liquidity Risk• Market Risk<ul style="list-style-type: none">-Interest rate risk-Foreign exchange rate risk-Price risk• Re-investment Risk• Credit/Default Risk
Business risk	<ul style="list-style-type: none">• Operating Risk• Legal/Regulatory/Compliance Risk
Country/Sovereign Risk Political risk	
Other risks	Reputation Risk

THE CHANGED IN ASSUMPTIONS ABOUT RISK MANAGEMENT

- ❑ Financial Market and Economic imbalances**
- ❑ Integration and mutation of financial risks**
- ❑ Great deleveraging**
- ❑ Regulatory reform**

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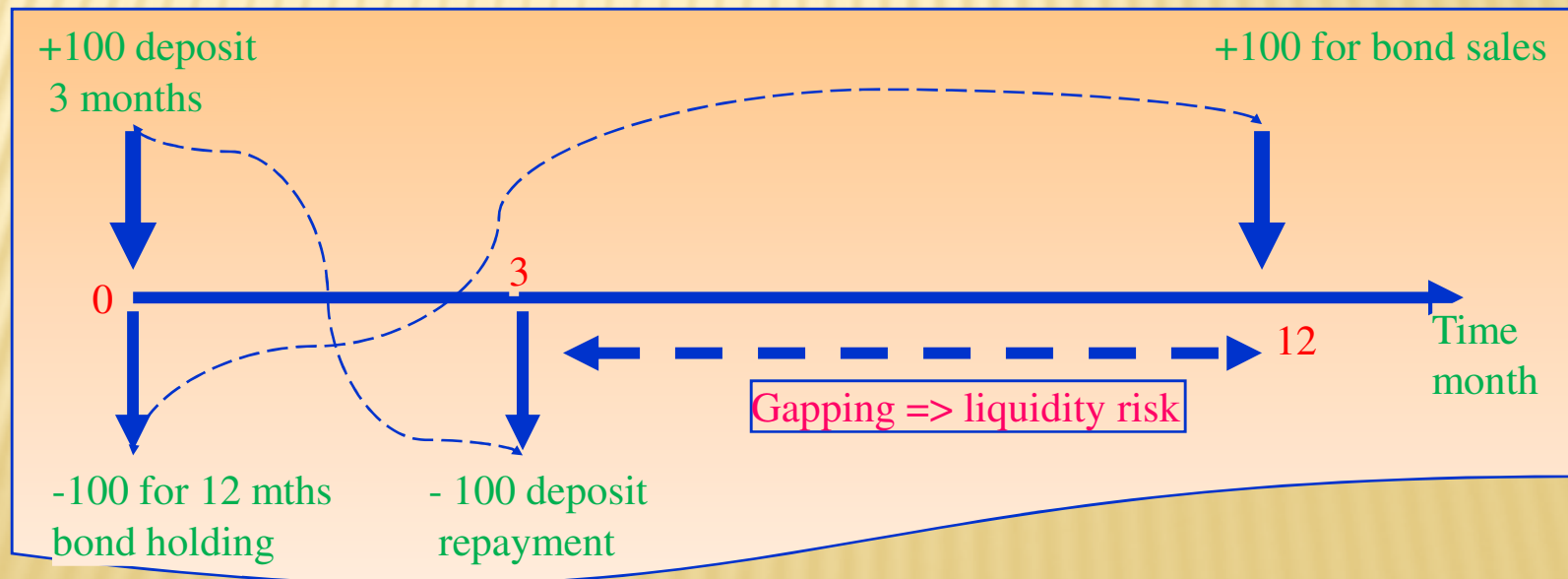
LIQUIDITY RISK

- ✘ Liquidity risk is the risk that an institution cannot easily unwind or offset a particular position quickly enough and in sufficient quantities without significantly affecting the previous market price because of inadequate market depth or market event.
- ✘ Liquidity Risk Forms:
 - + Funding Liquidity Risk
 - + Trading Market Liquidity Risk

LIQUIDITY RISK

- FUNDING LIQUIDITY RISK

- ✗ **Funding Liquidity Risk** is the risk of the Financial Institutions incurring potential losses or increased funding costs due to not being able to meet its liabilities or cash outflows when they fall due



How Funding Liquidity Risk Arise

- Size of regulatory reserve requirements
- Lending long and borrowing short (short-funded)
- Sudden increase in loans / decrease in liabilities
- Asset commitment exercised
- Sudden changes in investor preferences
- Influence by interest rate in the market
- Unexpected events → liquidity shortage in markets
- Failure of a related bank → heightened depositors concerns about the solvency of surviving banks

Case Study : Funding Liquidity Risk

– VND liquidity crunch in 2008

❑ Situation:

- Overheated credit growth in 2006-2008 in property & stock
- High inflation
- SBV restrictions
- Offshore investors' capital withdrawing

❑ Consequences

- Few lending on interbank market
- Banks stop lending to property and stock investors
- Bank raced to increase their saving deposit rate up to 18% p.a.

Liquidity Risk:

→ Banks are in difficulty to rollover their clients' deposits

→ Ask for SBV support and have to pay abnormal rate up to 40% p.a.

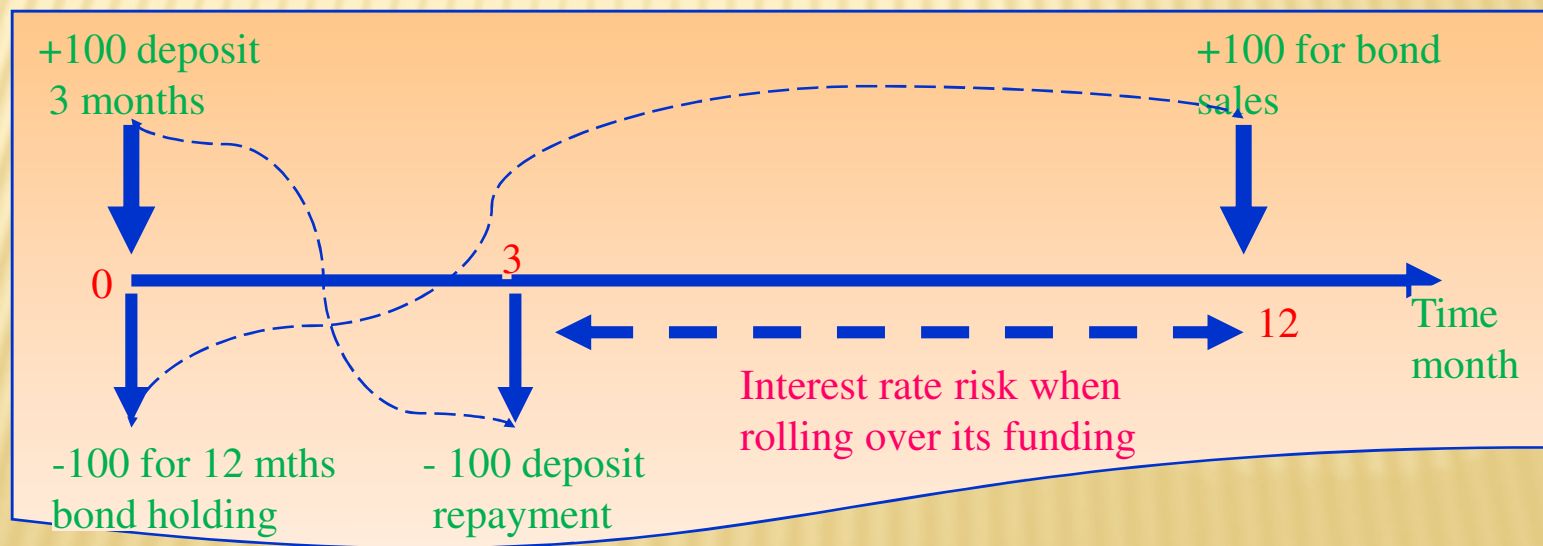
MARKET RISKS

- ❑ Market risk is the risk to a financial institution's condition resulting from adverse movements in market prices.
- ❑ Some Market Risk Forms:
 - ✗ Interest Rate Risk
 - ✗ Exchange Rate Risk
 - ✗ Price/Equity Risk

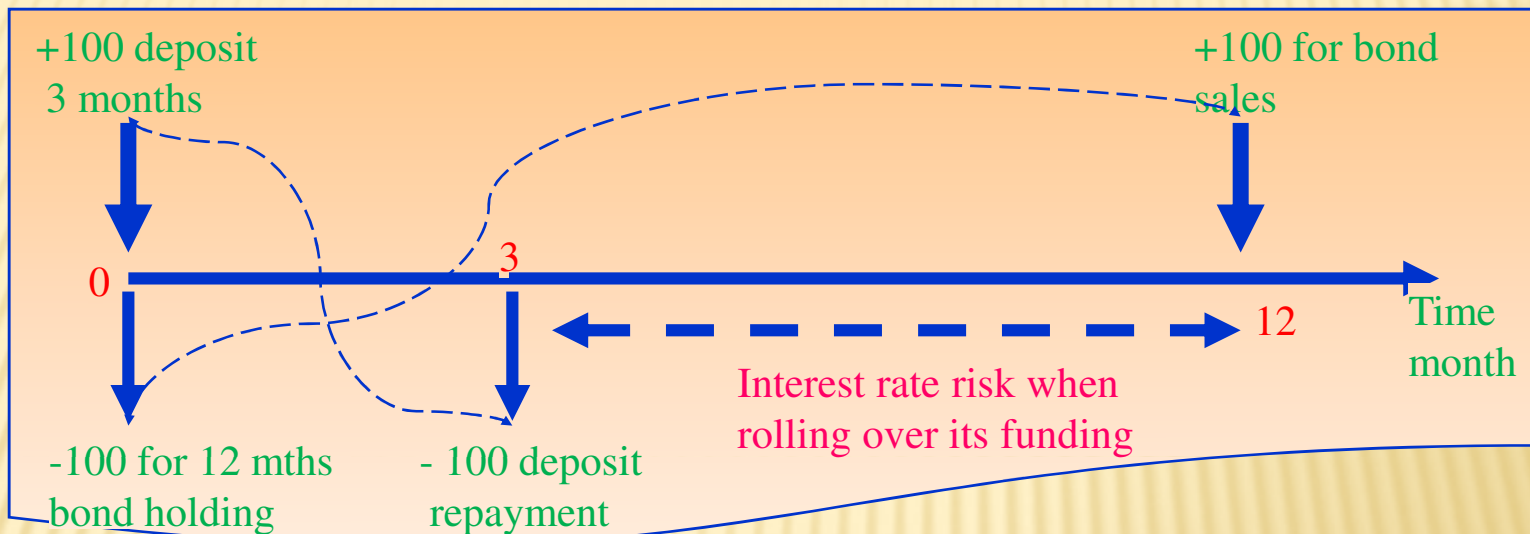
NOTES

MARKET RISKS - *INTEREST RATE RISK*

- ✗ The *interest rate risk* of a financial instrument is the potential for change in the present value of the future cash flows as a result of changes in interest rates.



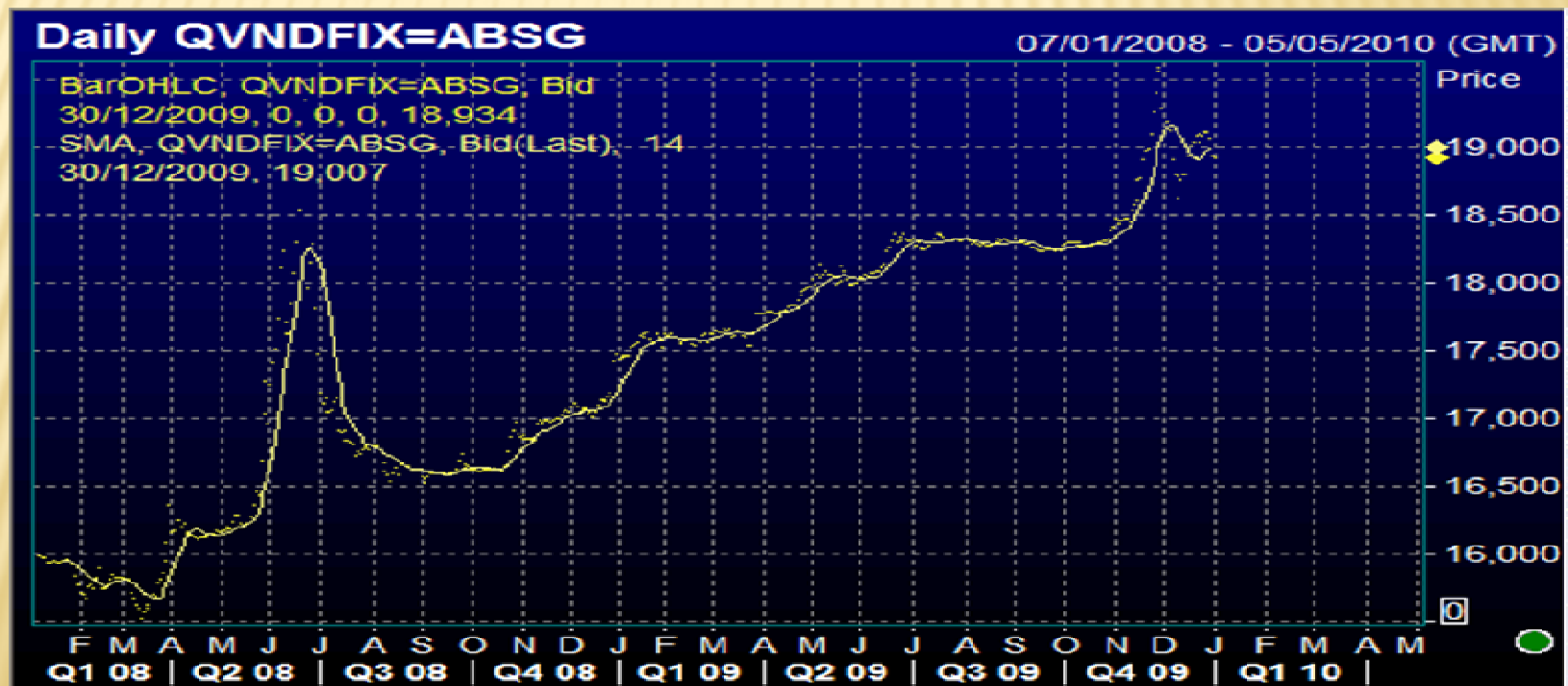
MARKET RISKS - INTEREST RATE VOLATILITY



Source: Bloomberg

MARKET RISKS - *FOREIGN EXCHANGE RISK*

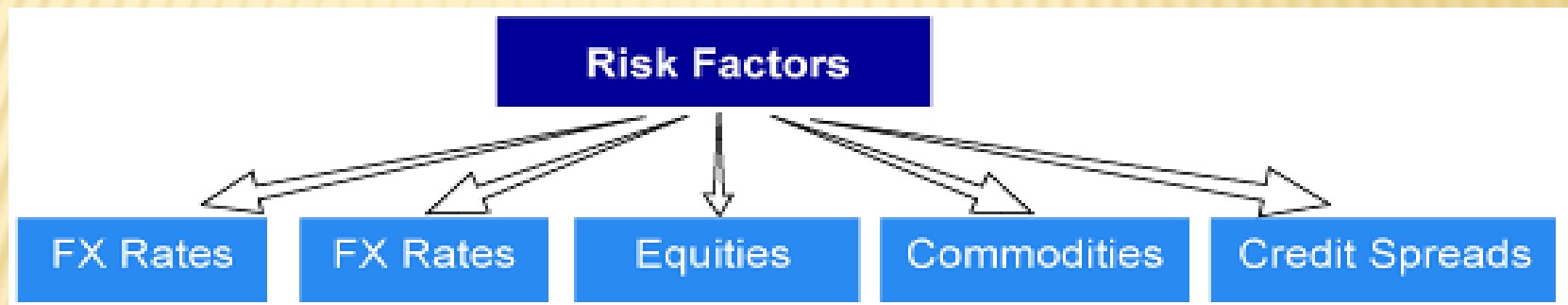
- ✗ *Foreign exchange risk* can be defined as the adverse movement in exchange rates that result in a loss for the financial institution from its foreign currency positions.



Source: Bloomberg 17

MARKET RISK – PRICE RISK

- ✘ Price Risk is a risk from a change in the level or volatility of interest rates, foreign exchange rates, or equity prices



MARKET RISK – EQUITY RISK

- ✗ VN Index : price volatility



Source: Bloomberg

Case Study : Market Risks

– VND bond collapsed in 2008

❑ Situation:

- Big carry trade position in 2007-2008
- VND funding cost inched up
- USDVND tight and too volatile
- Tight VND liquidity onshore
- Deleveraging of foreigners

❑ Consequences

- Bonds lost 20-40% of their value during the H2'2008
- Bond yields were pushed to as high as 20-30% on peak
- Implied USDVND moved from 16,000 to 19,000++

Interest rate risk

FX risk

Funding liquidity risk

Market Risks:

→ Bond market lost more than USD1 bn of its value in 2008

→ VND lost 15% value against USD

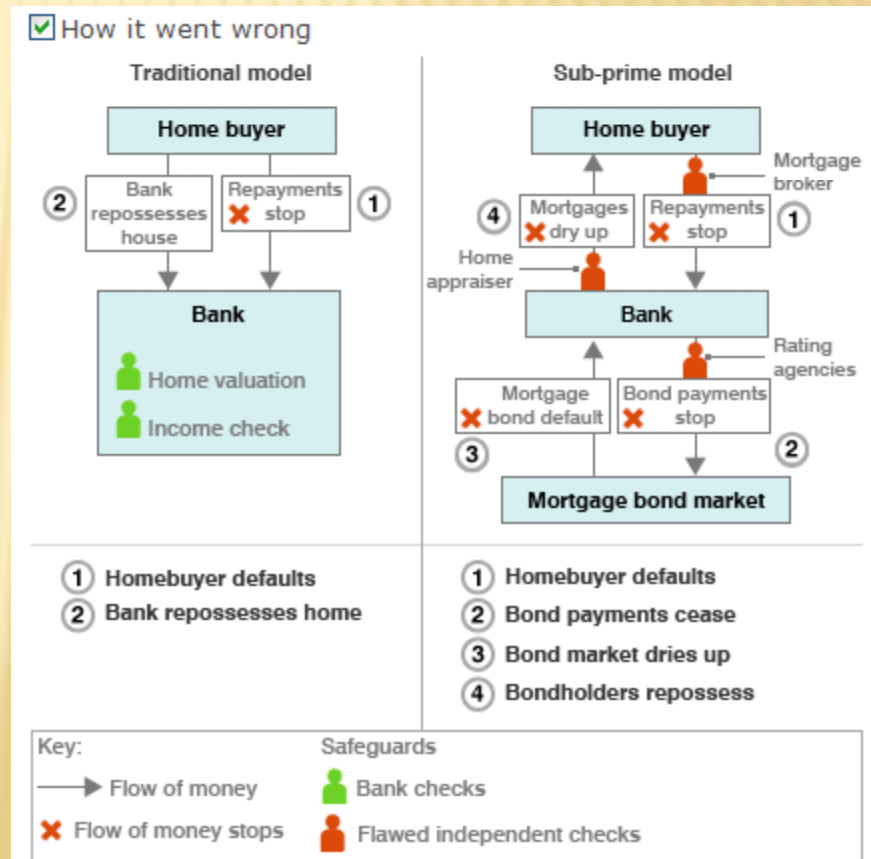
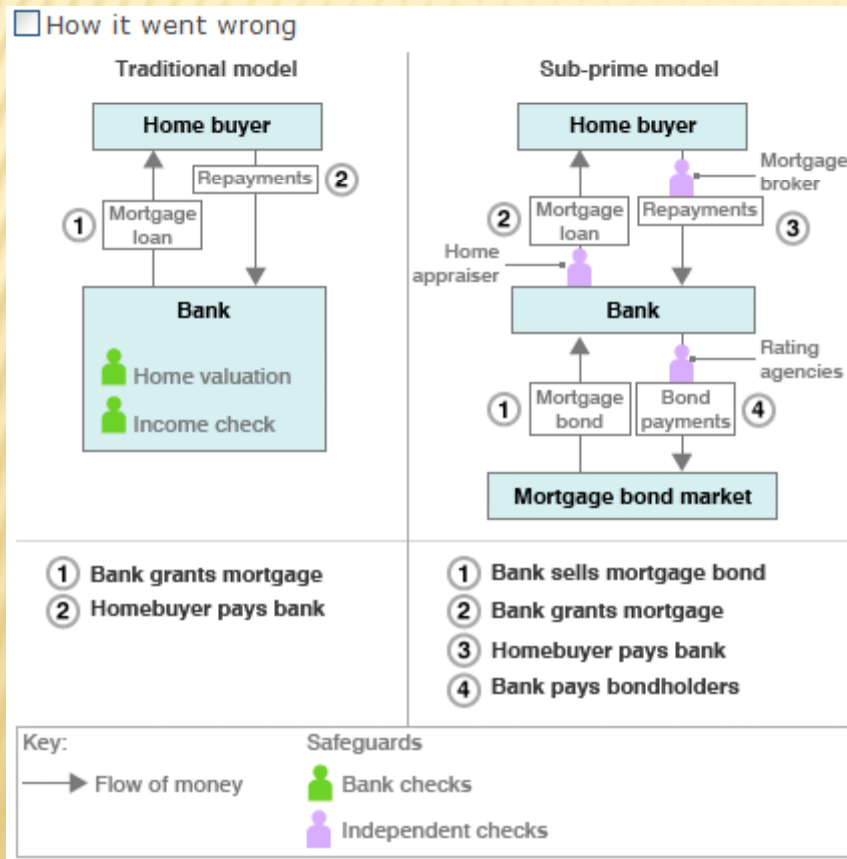
CREDIT RISKS

- ✗ Credit Risk is the risk of loss from a counterparty failing to perform its obligations to their dealing relating party
- ✗ Credit Risk Forms:
 - + Direct Credit Risk
 - + Counterparty Risk
 - + Credit Spread Risk
 - + Settlement and Pre-settlement Risk
 - + Issuer Risk ==> link between Market and Credit Risk

Case Study : Credit Risks

– US subprime crisis 2007-2008

The US sub-prime mortgage crisis has led to plunging property prices, a slowdown in the US economy, and billions in losses by banks. It stems from a fundamental change in the way mortgages are funded.



NOTES

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Other risks	

OPERATIONAL RISK

- ✖ Operational Risk is the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events.

OPERATIONAL RISK

- ✖ Common operational risk:
 - + Clients, products, and business practices
 - + Internal Fraud
 - + External Fraud
 - + Damage to physical assets
 - + Execution, delivery, and process management
 - + Business disruption and system failures
 - + Employment practices and workplace safety

LEGAL/REGULATORY RISK

- ✖ Legal/Regulatory risk is the risk of loss due to noncompliance with applicable laws and regulations.
 - + risk that a counterparty is not legally capable of making a binding agreement
 - + Regulatory risk - risk that a policy of a regulatory body conflicts with the intended transaction

CASE STUDY: OPERATION, LEGAL & REGULATORY RISK - SOCIÉTÉ GÉNÉRALE FRAUD CASE

- ✖ In January of 2008 Soc Gen lost \$7.14 Billion due to fraudulent actions committed by one of their traders.
- ✖ Jerome Kerviel, a Junior trader, made massive speculative “bets” on the futures market while concealing the true amount of the position that the bank was holding.
- ✖ His positions totaled \$73.3 billion -- more than the bank's market capitalization of \$52.6 billion at the time of discovery

CASE STUDY: OPERATION, LEGAL & REGULATORY RISK - SOCIÉTÉ GÉNÉRALE FRAUD CASE (CONT ..)

- ✘ Activities Involved
 - Several trades that were executed exceeded acceptable trading limits assigned to a given trader
 - Kerviel used old credentials from his previous position in back office trading and compliance to setup fictitious accounts. These accounts were used to match trades and thereby mask how long he was in a position.
 - Kerviel improperly accessed back office systems to replace canceled orders with new financial instruments to ensure that his fictitious operations were not detected.
- ✘ Government-mandated controls (i.e. policies, reports, separation of duties, etc.) do not require real-time monitoring. As a result, so-called 'adequate controls' are not timely enough to detect and prevent fraud.

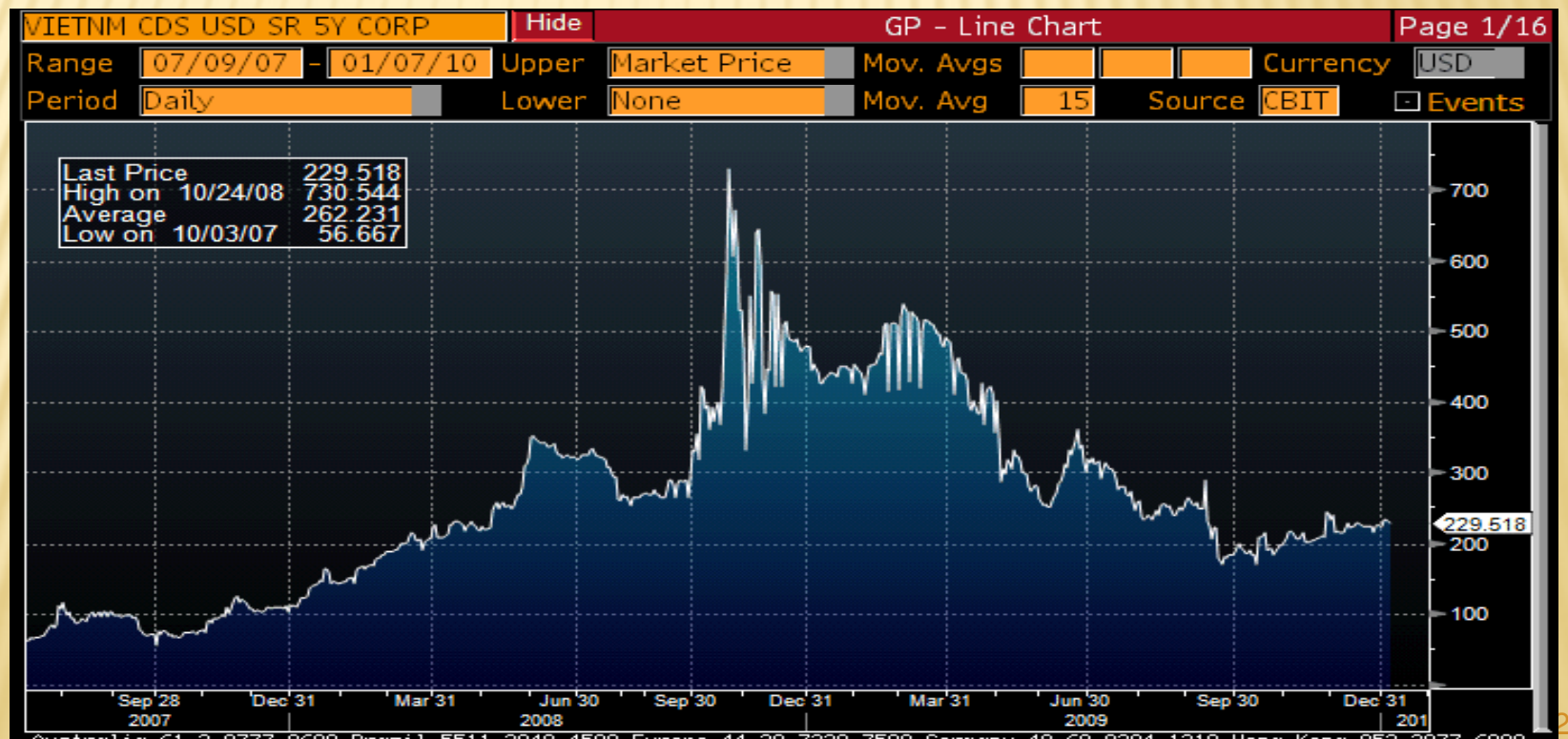
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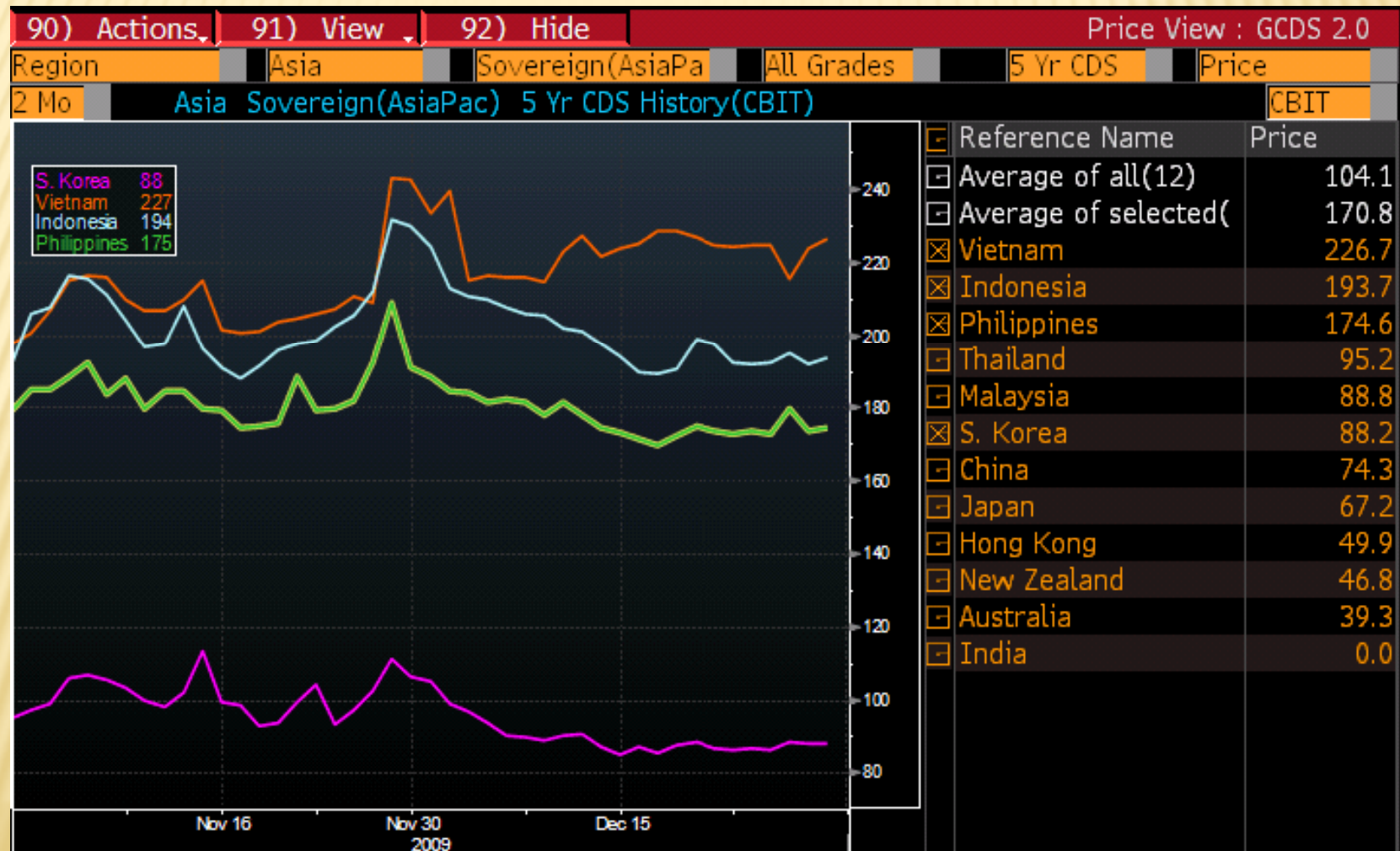
NOTES

SOVEREIGN/COUNTRY RISK

- ✗ Sovereign/Country Risk is the risk of loss due to economic and political disturbances and sovereign actions.
- ✗ The sovereign risk is factored in and also be glanced thru its Credit Default Swap (CDS) on the international markets



SOVEREIGN/COUNTRY RISK



Source: Bloomberg

NOTES

FORMS OF RISK

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Other risks	Reputation Risk, etc

REPUTATION RISK

- ✗ The threat that publicity concerning a transaction, counterparty or business practice involving a client will negatively impact upon the public's trust in a bank/firm
- ✗ Reputation risk in its broadest sense covers any action, event or circumstance that could damage an organization's reputation

REPUTATION RISK CONSEQUENCE

- ✗ **Bad publicity**
- ✗ **Distraction of senior management**
- ✗ **Exploitation by competitors**
- ✗ **Lost business, shareholder returns, trust**
- ✗ **Significant cost**
- ✗ **Regulatory action**

NOTES

Part II :

Risk Measurement and Management

ASSET & LIABILITY MANAGEMENT

- ✖ Balance Sheet management and adding value to capital employed
- ✖ Managing liquidity risks and maintaining optimal level of liquidity at all times
- ✖ Managing interest rate risks and foreign exchange risks while generating projected revenues
- ✖ Hedging & trading in interest rate instruments
- ✖ Complying with local regulatory requirements in respect of capital ratios and reserve requirements

RISK CONTROL AND RISK MANAGEMENT

- ✘ Risk control and risk management are essential for limiting bank's potential losses and managing exposure.
- ✘ Traders should have a thorough understanding of the different types of risks to which they are exposed and the methods and tools available to manage and control these risks.
- ✘ It is the responsibility of the individual trader and the regional product head to ensure that risks are carefully monitored and that risks are always maintained at an acceptable level.
- ✘ Limits will be reviewed on at least an annual basis.

+

MARKET RISK MANAGEMENT

- ✘ Risk Control: Market risk is monitored and reported by Business Risk Controlling. Risk Control utilises a Value-At-Risk (“VAR”) model and a PV01 model, which provides a statistically based measure of the risk of a portfolio.

LIQUIDITY RISK MANAGEMENT

- ✘ Liquidity Risk is the risk that the Bank is unable to meet a financial obligation to a customer, creditor, or investor when due.
- ✘ Objective of Liquidity Risk Management (funding): Ensure all maturing obligations and commitments are paid fully and promptly.

LIQUIDITY RISK MANAGEMENT

- × **Two types of Liquidity Risk:**

- + **Funding Liquidity Risk** - risk that funds will not be available when needed to meet financial commitments when due
 - × **Operating** (“**Business-as-Usual**”) risks arising from daily funding and trading activities in normal markets
 - × **Contingency risks** arising from external events such as market disruptions, political events, a specific bank name problem in the market.

LIQUIDITY RISK MANAGEMENT

+ Trading Liquidity Risk

- Risk that assets cannot be liquidated quickly enough. This can happen when the depth or liquidity of a market disappears making it difficult and costly to close or modify positions.

LIQUIDITY RISK MANAGEMENT

Two Different Types of Funding Gaps:

- × **Structural Funding Gap** which is caused by the nature of the business when the maturities of customer assets do not match customer liabilities.
- × **Treasury Gap** created deliberately by trading in the money markets, e.g. borrowing short and lending long when interest rates are expected to fall.

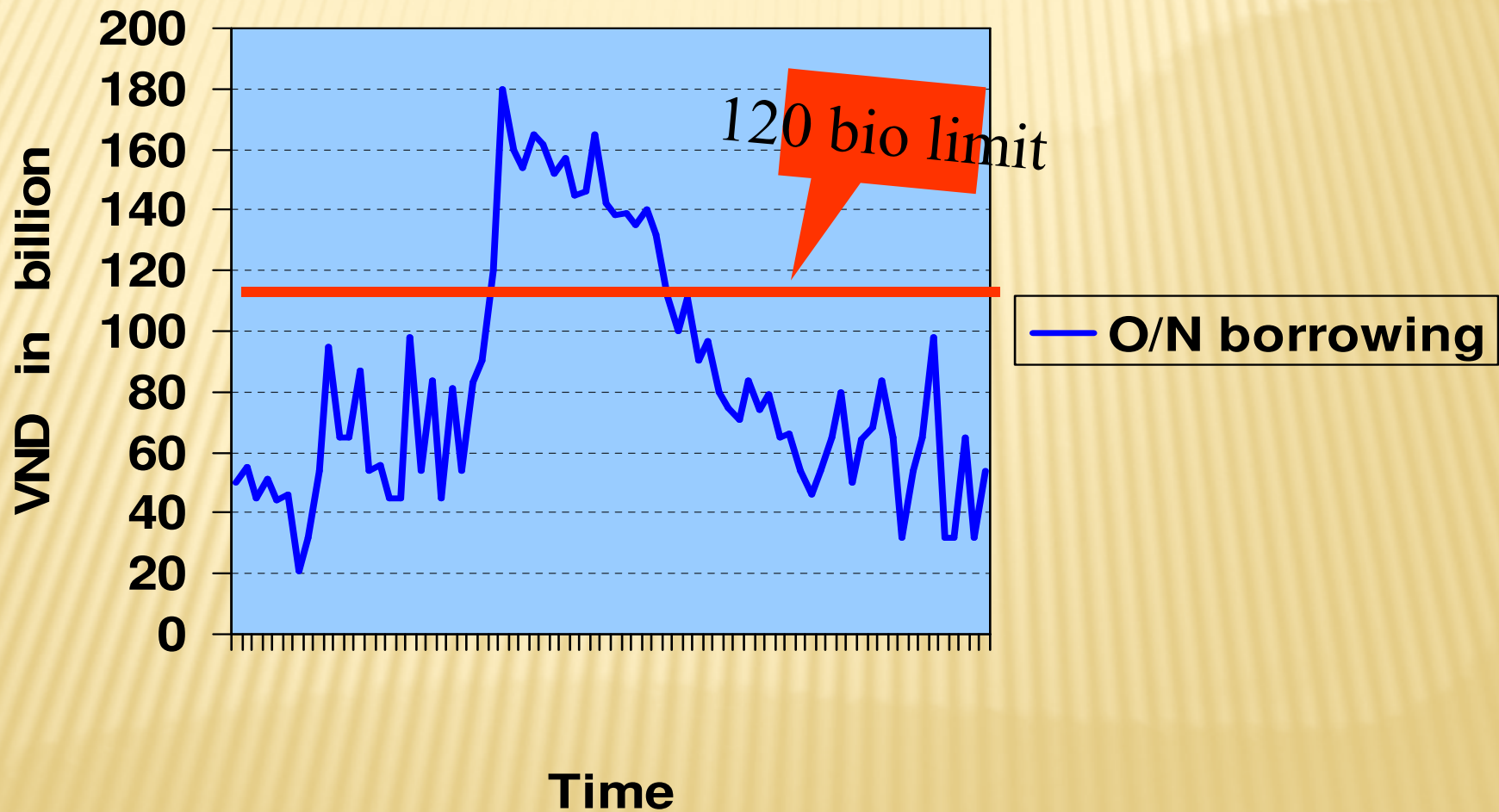
LIQUIDITY RISK MEASURE

- ✗ **Liquidity risk** is the risk of the bank incurring potential losses or increased funding costs due to not being able to meet its liabilities or cash outflows when they fall due
- ✗ Liquidity risk controls
 - MCO
 - O/N borrowing limit
 - Market dependence limit
 - ...

MAXIMUM CUMULATIVE OUTFLOW (MCO)

- ✘ Liquidity controlled through limits on maximum amounts of funding that are due during different time periods. Maximum Cumulative Outflow (MCO)
- ✘ To analyze and monitor short-term liquidity position
- ✘ To prevent excessive dependence on overnight liquidity
- ✘ Treasury monitors expected cash flows to project future overnight funding requirement and sets the MCO limits
- ✘ Summarizes tenor cashflows of on- and off- balance sheet items based on contractual maturities or behavioral assumptions
- ✘ Limits based on capacity to raise funds in the professional market.

CASH FUNDING FOR OVERNIGHT (CONTINUE ...)



LIQUIDITY RISK MANAGEMENT

- ✗ Other Liquidity Risk Measures:
 - + Cross Border Funding Limit
 - ✗ Funding from related entities offshore
 - + Contingency Funding Plan
 - ✗ Scenario analysis and planning
 - + Liquid Assets Analysis/Cover
 - ✗ Adequacy of liquidity to cover any shortfall in cashflow
 - + Large Funds Providers
 - ✗ Funding concentration measure

LIQUIDITY RISK MANAGEMENT

Stress Liquidity

The Bank must be in a position to ensure that its commitments are met even when some unforeseen event causes conditions to be far from normal.

INTEREST RATE RISK

- The *interest rate risk* of a financial instrument is the potential for change in the present value of the future cash flows as a result of changes in interest rates.
- **Domestic factors**
 - ❖ Government
 - ❖ Inflation
 - ❖ Market conditions
- **Foreign factors**
 - ❖ Government
 - ❖ Inflation
 - ❖ Market conditions

COMPONENTS OF INTEREST RATE

Risk free rate = Real return + Inflation premium

Nominal rate = Risk free rate + Risk premium

INTEREST RATE/PRICE RISK MANAGEMENT

✕ Risk Measures

+ Value-at-Risk (VaR)

- ✕ A statistical estimate for a given level of probability of potential losses over a specified period of time due to changes in market factors.

+ Mark-to-Market (MTM) Valuation

- ✕ Loan/Deposit: PV01
- ✕ Foreign Exchange: PV01
- ✕ Government Securities: DV01/Duration/Convexity

VALUE-AT-RISK (VAR)

✕ Volatility Analysis

- + Historical Data

- + Obtain the standard deviation (sd)

 - ✕ 1 sd = 84% = 1 in 6 days

 - ✕ 2 sd = 97.5% = 1 in 40 days

 - ✕ 2.326 sd = 99% = 1 in 100 days

 - ✕ 3 sd = 99.87% = 1 in 750 days

- + Annualization

VALUE-AT-RISK (VAR)

$$\text{VaR} = \text{Position} \times \text{Volatility}$$

VAR METHODS

✗ **Parametric VAR or Analytical or Correlation Method**

- + It is based on based on the estimate of the variance-covariance matrix of asset returns, using historical time series of asset returns to calculate the standard deviations and correlations
- + The main assumption is that the distribution of asset returns are normal. This means that the variance-covariance matrix completely describes the distribution.

VAR METHODS

× Historical Approach

- + Tries to assess VAR without resorting to the assumption of normality
- + Uses prices and values for assets from a chosen historical time-period
- + To compute historical VAR, one needs a historical record of the daily p&l of the portfolio whose risk needs to be measured. Based on this historical record, generate an empirical distribution of the daily p&l.

VAR METHODS

× Simulation Approaches

- + Historical Simulation: Instead of looking at the volatility of the actual portfolio returns in the past, simulate the past portfolio returns using the actual values of risk factors and the current portfolio composition. Then, construct the empirical frequency distribution of the simulated portfolio returns by ranking them into percentiles and determining the VAR at the chosen confidence level.

VAR METHODS

× Simulation Approaches

- + Monte Carlo Simulation: Technique that uses random numbers to create future possible returns. Instead of using the past values of the risk factors, one can model these factors by specifying the underlying distributions and their parameters. Using these, generate thousands of hypothetical scenarios for the risk factors and determine the portfolio value for each scenario. As in the historical simulation, the resulting portfolio returns can then be used to construct the empirical frequency distribution and determine the VAR at the desired confidence level.

INTEREST RATE RISK – PV01

- ✗ PV01 is NPV of a loan or deposit when its interest rate moves by 01 bps
- ✗ For example:

VND10 bio 3-month deposit @ 8.0% p.a
if interest rate moves up by 01 bps to 8.01%
→ $PV = 10\text{bio} (1+8\%*91/360)/(1+8.01\%*91/360)$
= 9.999,752,239
→ $PV01=NPV=9.999,752,239-10,000,000,000$
= **-247,761**

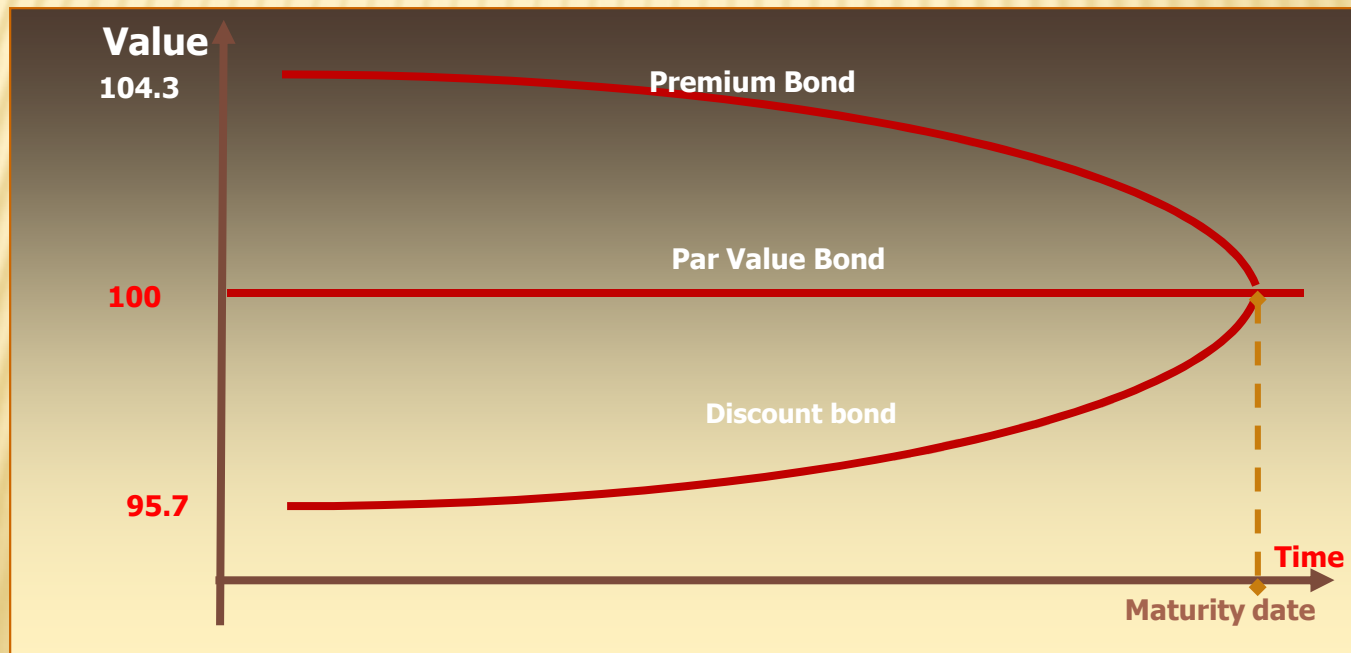
- ✗ PV01 of a portfolio is a total PV01 of all loans/deposits in its portfolio

RELATIONSHIP BETWEEN COUPON RATE, REQUIRED YIELD AND PRICE

Coupon rate = required yield then	Price = Par
Coupon rate < required yield then	Price at Discount < Par
Coupon rate > required yield then	Price at Premium > Par

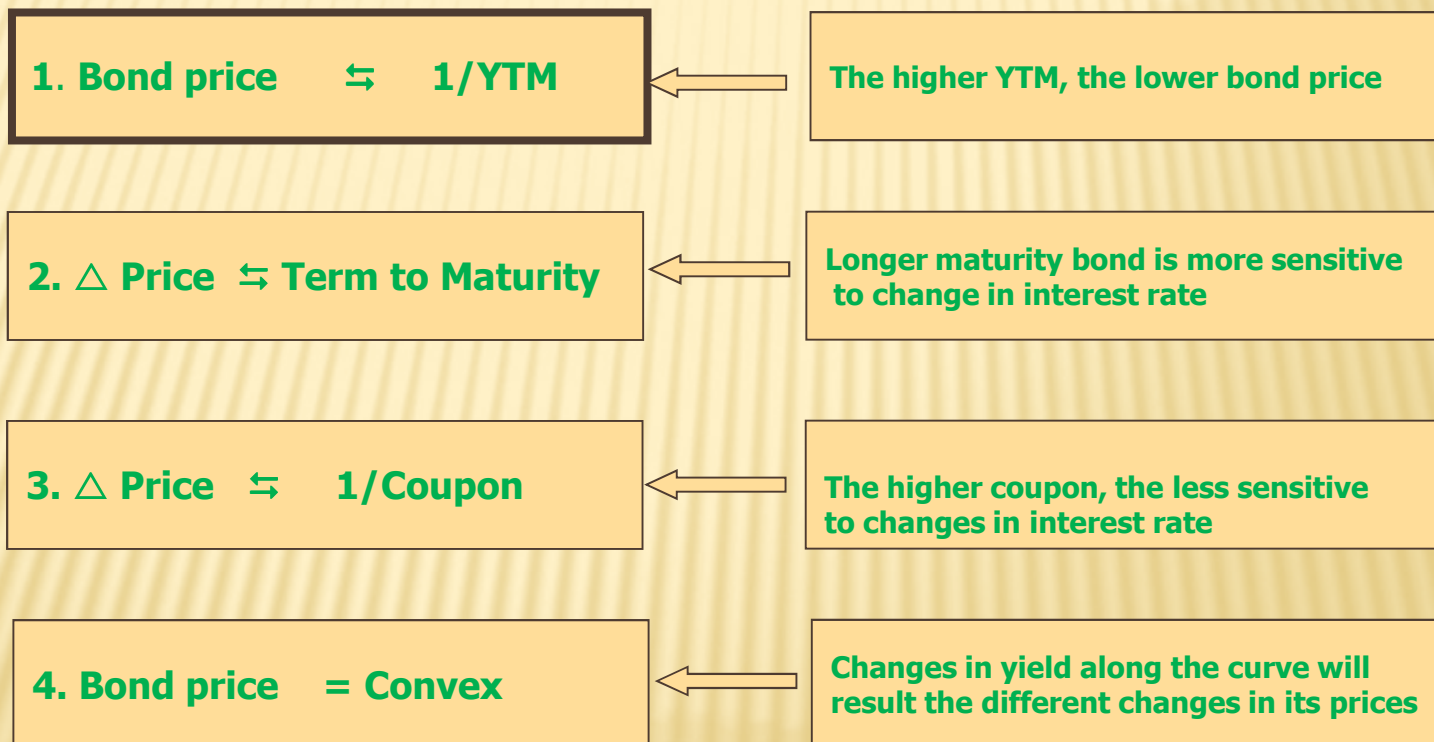
BOND PRICE BEHAVIOR

- × Reason for the change in the Price of Bond
 - Time path : as the bond moves toward maturity, the price will approach par
 - A change in the level of interest rates
 - A change in the credit quality of the issuer



INTEREST RATE RISK

✗ Bond Price behavior:

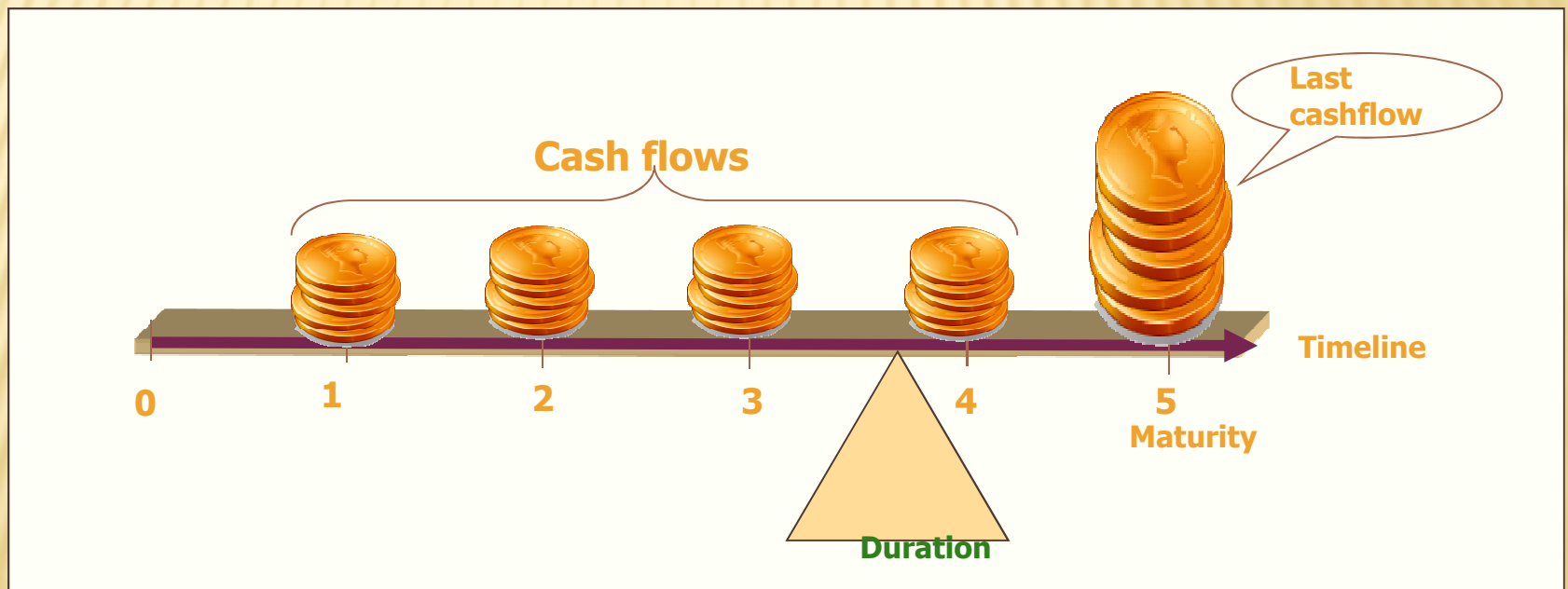


DURATION

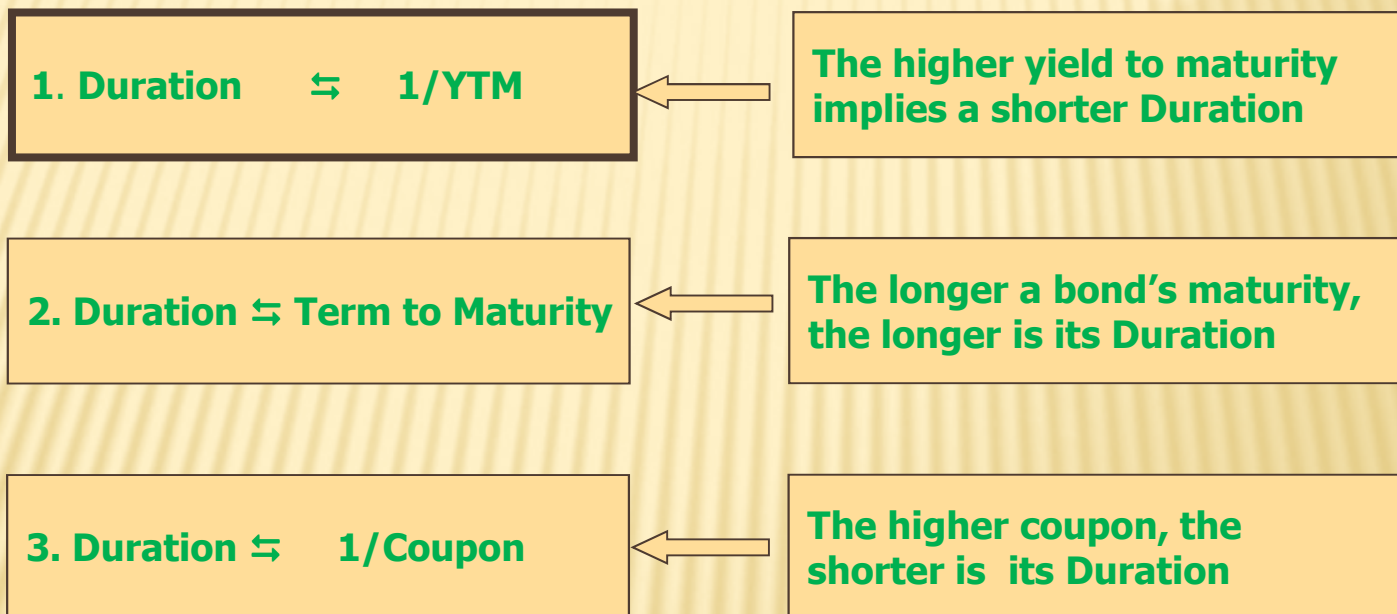
- × A method used for measuring interest rate risk
- × Duration is the weighted average term to maturity of a bond's cash flows where the weights are the present value of each cash flow relative to the present value of all cash flows
- × A measure of a bond's sensitivity to changes in bond yields
- × Effective duration = $(V_- - V_+) / (2 \times V_0 \times \text{change in Yield})$
- × Modified Duration (MD) = Macaulay Duration / $(1 + 0.5 \times \text{YTM})$
- × $\Delta \text{ Price} = - \text{MD} \times \Delta \text{ YTM}$

DURATION UNDERSTANDING

- ✗ Duration is the approximate % change in a bond's price for a 100 bps change in yield
- ✗ Duration is the weighted average time to receive the PV of each of the bond's coupons and principal repayment



DURATION PROPERTIES



MACAULAY DURATION

- ✗ Macaulay Duration is a measure of the interest rate sensitivity of a bond
- ✗ The longer the duration, the more responsive is a bond's price to changes in yields

$$\text{MacauleyDuration} = \frac{\sum_{t=1}^n (\text{PVCF}_t \times t)}{\sum_{t=1}^n (\text{PVCF}_t)}$$

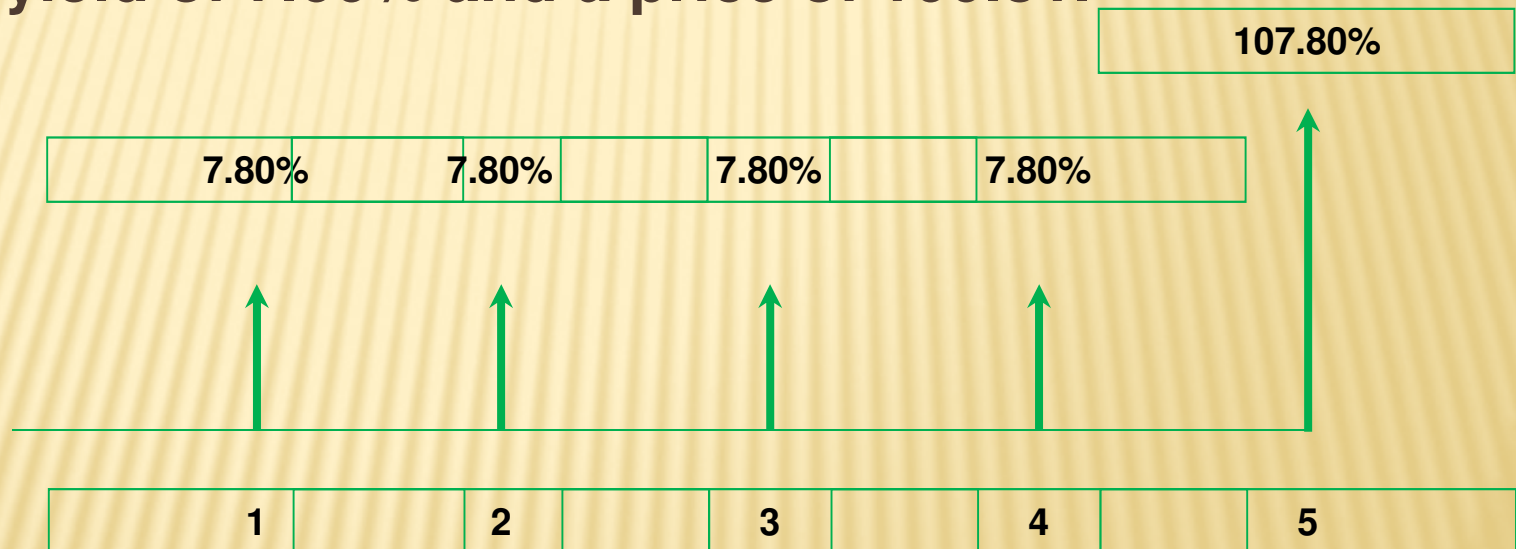
- ✗ Where: PVCF_t = Present Value of Cash Flow at time t

Or,

- ✗ Macauley duration =
$$\frac{\text{Sum of present values of time-weighted cash flows}}{\text{Bond Price}}$$

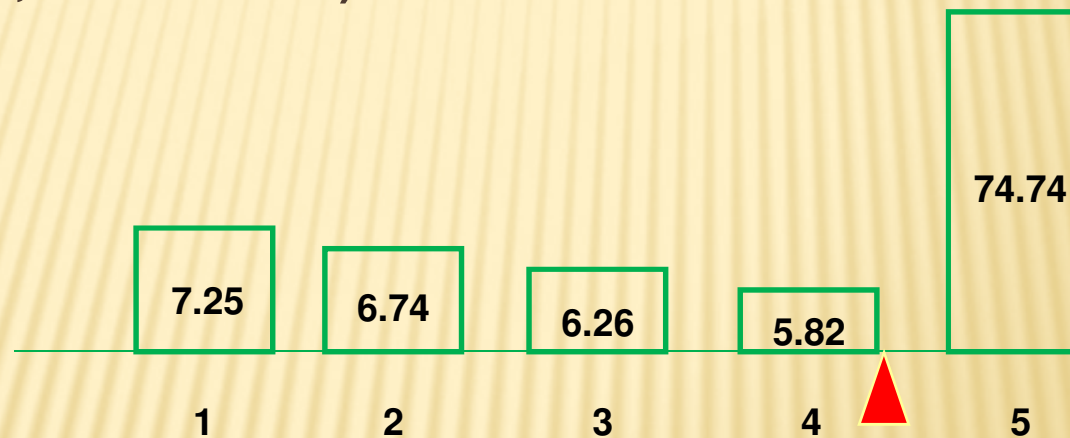
MACAULAY DURATION: 5Y VIETGB

- ✗ As an illustration, consider a 5 year Vietnam Government Bond with 7.80% coupon, trading at a yield of 7.60% and a price of 100.81.



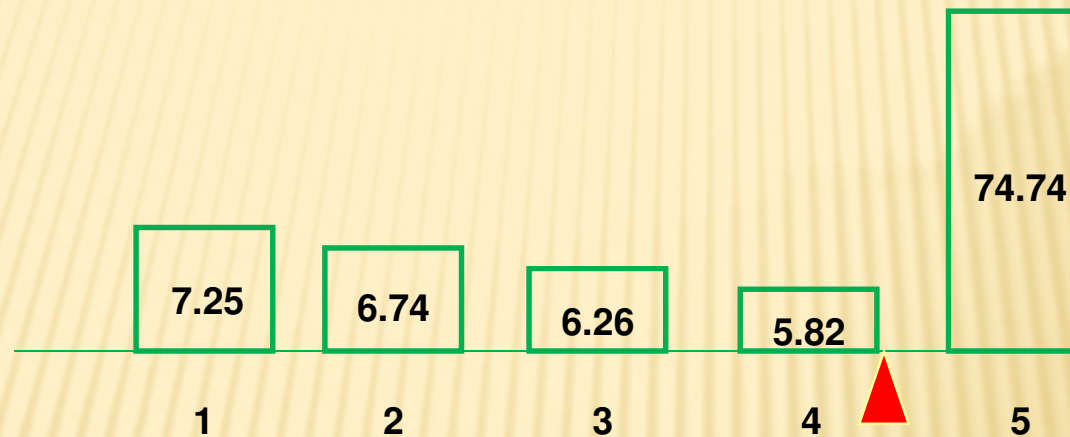
MACAULAY DURATION: 5Y VIETGB

- ✗ Consider the present value of each cash flow, each discounted by yield of 7.60%, (e.g. $7.80/(1.076)^1 = 7.25$, and $7.80/(1.076)^2 = 6.74$, and so on...)



- ✗ The average life (the Macaulay duration) is 4.33 years – where the fulcrum balances out the cash flows (see calculations on following page).

MACAULAY DURATION: 5Y VIETGB



✗ **Macauley Duration** =
$$\frac{(7.25 \times 1) + (6.74 \times 2) + (6.26 \times 3) + (5.82 \times 4) + (74.74 \times 5)}{100.81} = 4.33$$

$$\frac{\text{Sum of PVs of time - weighted cashflows}}{\text{Bond Price}}$$

CONVEXITY

- ✗ Convexity is the curvature of the price/yield curve. It explains the difference between the actual bond price and the price estimated using the Duration model.
- ✗ The price/yield relationship for large changes in yield is convex and not linear. A large decrease in yield results in a greater percentage increase in price than the percentage decrease in price for an equal increase in yield.
- ✗ To determine approximate percentage change in price due to convexity:
$$1/2 \times \text{convexity} \times (\text{percentage yield change})^2$$

CONVEXITY

Convexity (in yrs) is given by:

$$\frac{1}{[1+(y/k)]^2} \frac{\text{Sum}(t \times (t+1) \text{ PVCF } t)}{k^2 \times \text{PVTCF}}$$

DURATION AND CONVEXITY

- ✗ To determine change in price of a bond using duration and convexity:

Total Price Change = Price Change due to Duration + Price Change due to Convexity

- ✗ Duration: way of comparing interest rate risk between securities with different coupons and different maturities.
 - + Macaulay Duration
 - + Modified Duration: measure of interest rate/price sensitivity of a bond.
- ✗ Convexity: represents the extent to which duration underestimates return.

PORTFOLIO RISK VALUE: DV01

- ✗ DV01 is value change in a bond price if 01 bps changed in yield of its tenor
- ✗ **DV01 (in value) = Duration x Bond market value /10.000**
- ✗ For example:
a bond has a duration of 10.44, suppose the market value of this bond that a manager owns is VND50 bn.

If yield change by 100 bps → approx bond value change=5.22 bn
If yield change by 50 bps → approx bond value change=2.61 bn
If yield change by **01 bps** → approx bond value **change=0.05.22** bn
- ✗ A portfolio may consist of many bonds, and each individual bond will have different DV01
- ✗ DV01 of portfolio = Total DV01 of all bonds in the portfolio

TEST

5. A manager owns a below portfolio which consists of the 5 bonds:

- a) How much is the portfolio risk – DV01 ?
- b) If the yield changes in same direction by 25 bps across the curve, what is the risk value ?
- c) If the market yield change as below, what is the approx risk on this portfolio: 2Y up 100bps, 3Y up by 50 bps, 5Y unchanged, 10Y down by 10 bps, 15Y down by 15 bps

(VND in mio)				
Bond	Tenor	Coupon % p.a.	MD	Face Value
1	2	16.50%	1.65	100,000.00
2	3	8.00%	2.40	150,000.00
3	5	9.35%	4.55	250,000.00
4	10	8.10%	7.60	125,000.00
5	15	9.50%	12.80	100,000.00

TEST SOLUTION – BOND RISK AND BEHAVIOR

(VND in mio)								
Bond	Tenor	Coupon % p.a.	MD	Face Value	Market value	DV01	Yield change (bp)	Risk
1	2	16.50%	1.65	100,000.00	106,000	17.49	100	(1,749)
2	3	8.00%	2.40	150,000.00	133,000	31.92	50	(1,596)
3	5	9.35%	4.55	250,000.00	248,000	112.84	0	-
4	10	8.10%	7.60	125,000.00	117,000	88.92	-10	889
5	15	9.50%	12.80	100,000.00	103,000	131.84	-15	1,978
Total				725,000.00	707,000.00	383		(478)

- a. DV01 of the portfolio = VND 383 mio
 b. If 25 bps move across the curve

- c. Nonparallel shift
 Risk = -VND478 mio

$$\text{Risk} = \text{DV01} \times 25 = 383 \times 25 = \text{VND } 9,575 \text{ mio}$$

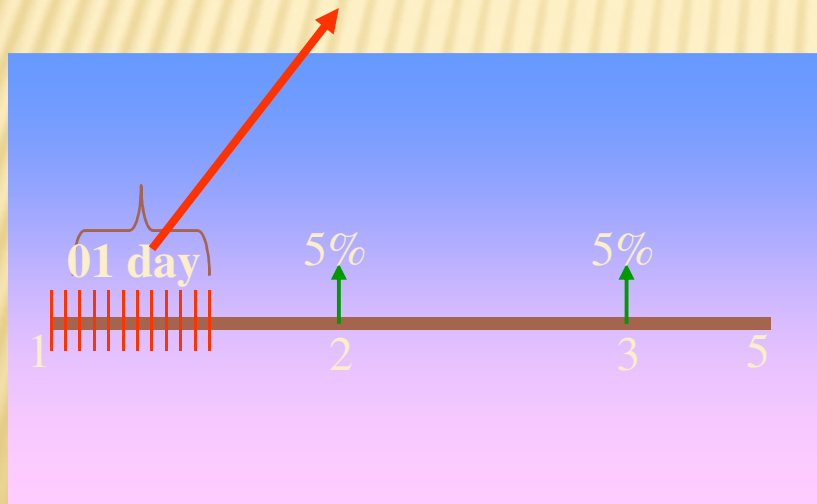
Accounting treatment & Operations

- 1. Bond accounting**
- 2. Bond operation**

PROFIT & LOSS: ACCRUAL V.S MARK-TO-MARKET

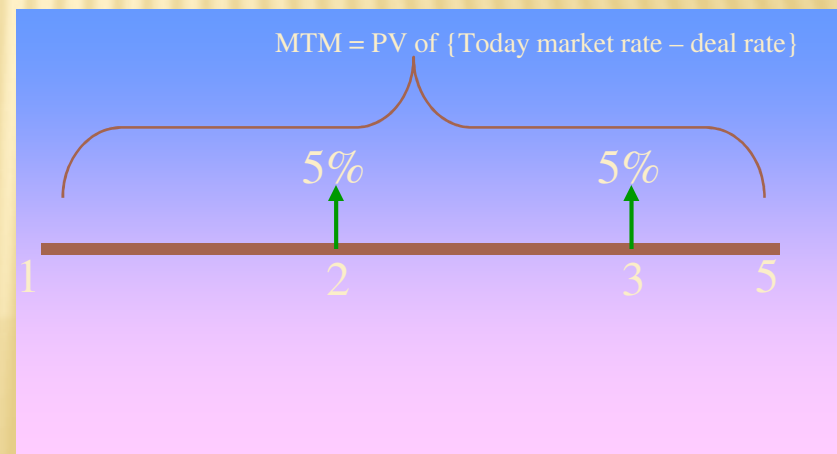
Accrued method

- ✗ This is accounting way
- ✗ P&L = accrued Interest coupon day-by-day
- ✗ 01day accrued P&L
= {1 day} x {cpn%} x {Amount}



Mark-to-market method

- ✗ This is management way
- ✗ P&L = potential and opportunity cost or revenue for the whole remaining maturity
- ✗ MTM P&L = NPV of cash flows



BOND CLASSIFIED FOR ACCOUNTING

- ✖ Bond can be classified into 3 portfolios

	Accounting	MTM
➤ Hold to maturity	Amortised cost	NA
➤ Available for sales (AFS)	Fair value	MTM
➤ Trading	Fair value	MTM - P/L

- ✖ The intention to hold must be clearly stated since the acquisition date.
- ✖ The transfer between portfolio should rarely incur and need approval from Risk Controlling and GM Head.

VIETNAMESE ACCOUNTING STANDARD

- ✘ Letter 7459 /NHNN-KTTC regarding accounting for securities investment from sbv.
- ✘ Classified fixed income into 3 groups: held to maturity, Available for Sale and Trading
- ✘ Each will have different accounting method
- ✘ Banks will have to designate type of portfolio when adding new bonds into respective portfolio.

VIETNAMESE ACCOUNTING STANDARD

- ✖ Trading:
 - + Record at cost
 - + No MTM accounting
 - + No accrued interest accounting
 - + Only recognized pnl when sold.
- ✖ Available for sale:
 - + Record at face value
 - + Allocate discount / premium in straight line method monthly until maturity
 - + accrued interest accounting
- ✖ Held to maturity:
 - + Similar to Available for Sale

VIETNAMESE ACCOUNTING STANDARD

- ✘ Most bank use Available for Sale or Held to Maturity method.
- ✘ There is no concept of MTM hence at any point in time, management can not estimate potential impact on pnl if portfolio is liquidated.
- ✘ Straight line allocation of discount / premium can create difference impact on pnl reporting depending on coupon yield

HOW TO MANAGE REPUTATION RISK

- ✘ Reputation risk is real and, like other forms of risk, it must be managed and controlled
- ✘ It is everybody's responsibility to be on the lookout for transactions or clients that may raise Reputation Risk issues
- ✘ Reputation Risk need to be identified, determine whether they are acceptable and provide procedures for further escalation, approval and mitigation

HOW TO MANAGE REPUTATION RISK

- ✗ **Client handling: guideline on**
 - + **Customer adoption,**
 - + **Handling client order**
- ✗ **Approval and Escalation process**
- ✗ **Product & Inventor guideline**
 - + **Transaction appropriate to the investor ?**
 - + **Transaction raise any social responsibility issue ?**
 - + **Off market rate ? Historical rate rollover ?**
 - + **Investor's improperly entering the transaction ?**

HOW TO MANAGE REPUTATION RISK

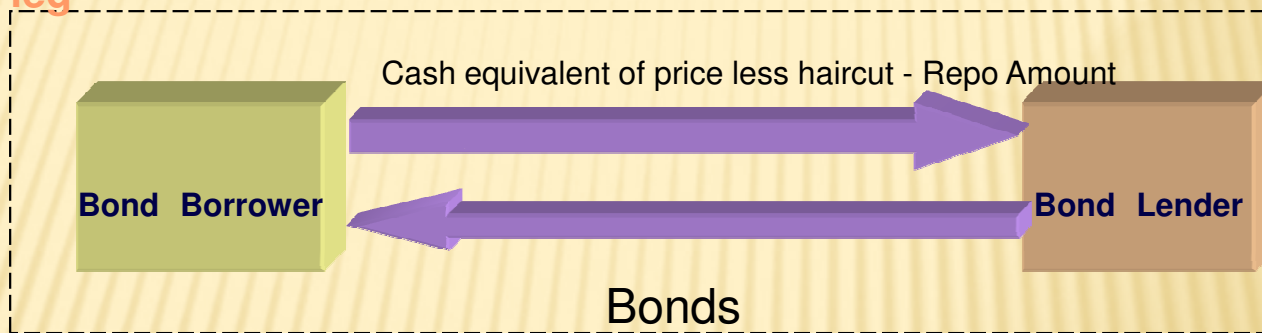
- ✗ **Gifts : gift received, gifts to public or government officials**
- ✗ **Complaints policy: fairly, effectively, and promptly**
- ✗ **Conflict of Interest**

Part III :

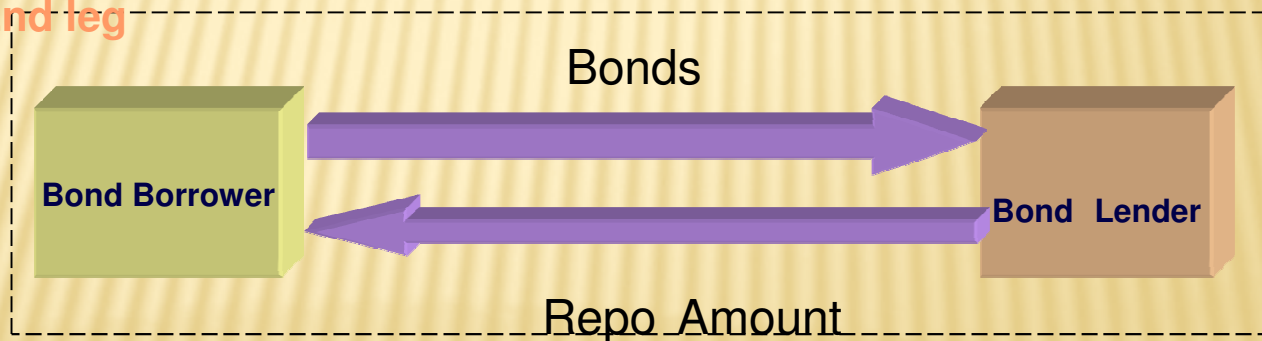
Risk mitigation instruments

REPO AND BUY-SELL BACK TRANSACTIONS

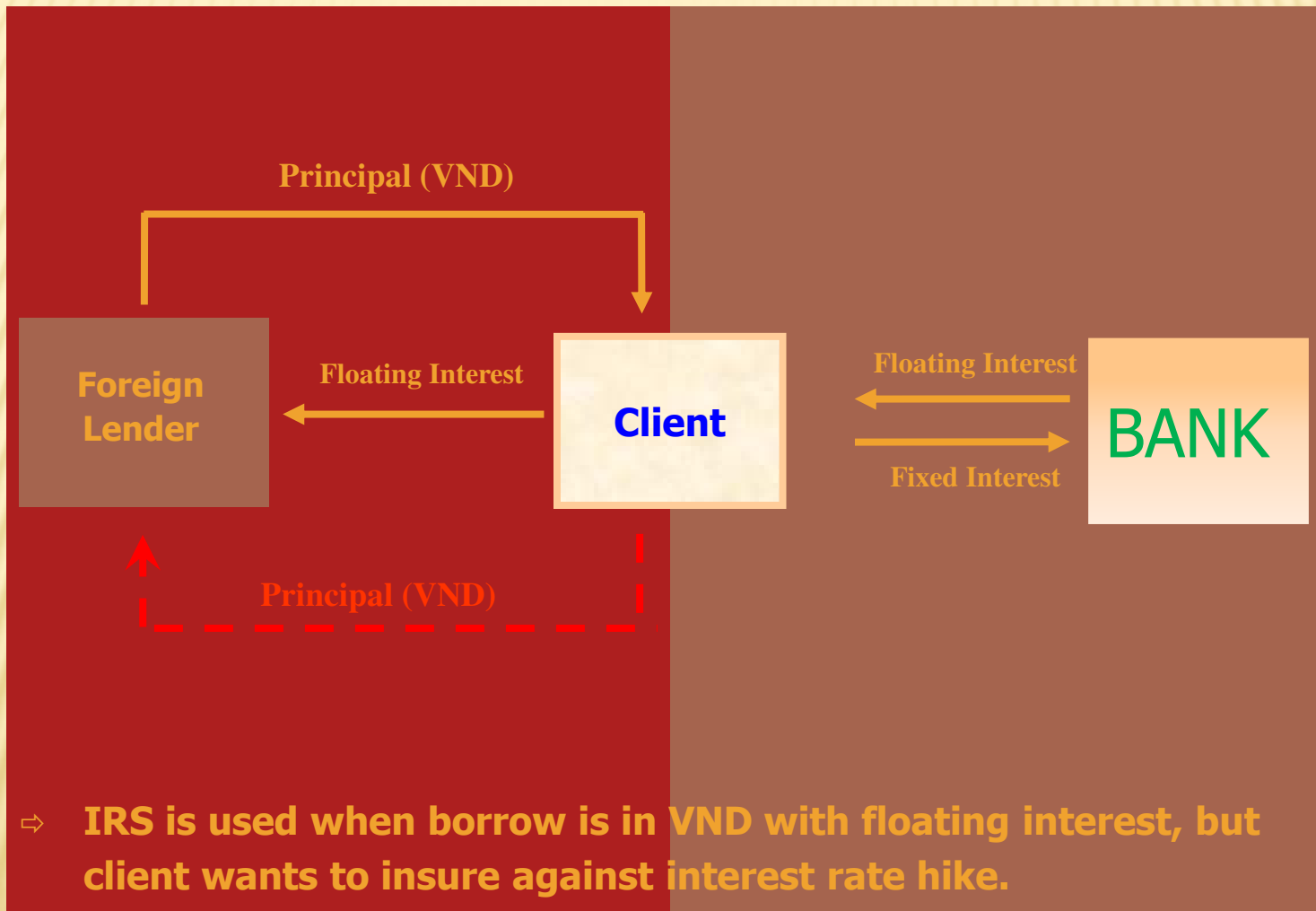
Purchase Leg /
Start leg



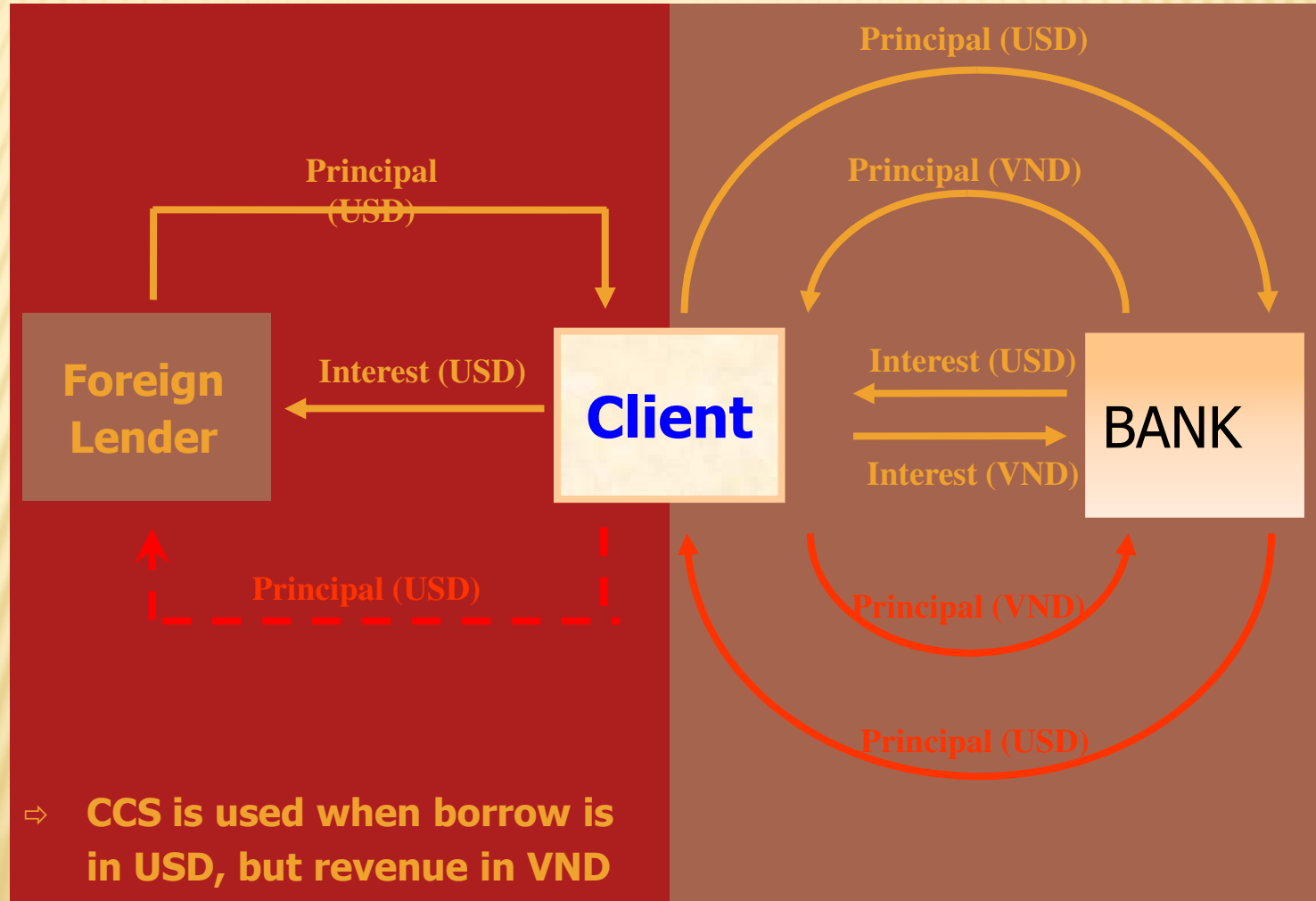
Repurchase
Leg / End leg



INTEREST RATE SWAP



Cross Currency Swap

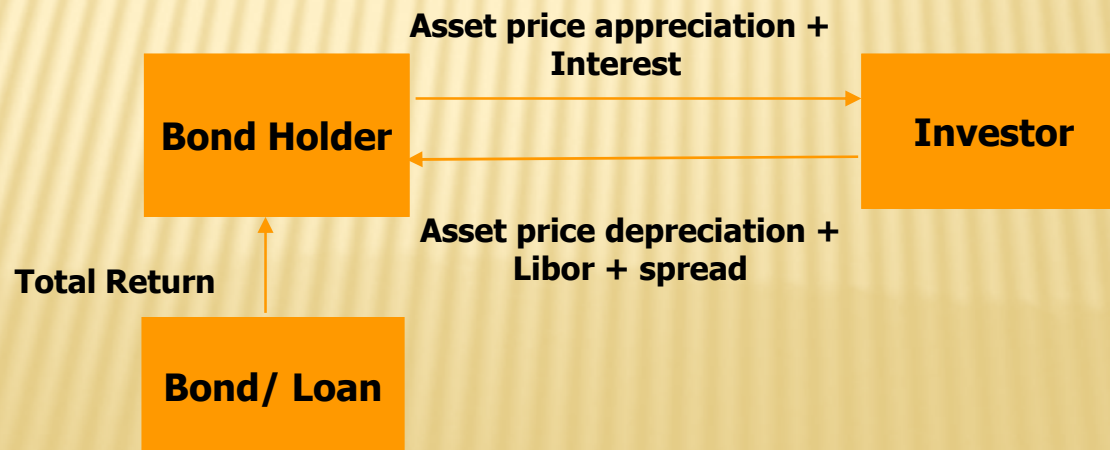


WHAT ARE CREDIT DERIVATIVES?

- ✖ A derivative product is an instrument or contract whose value is determined by the performance of another instrument or contract
- ✖ Credit derivative returns are tied to the performance of a credit risk related measure. These include:
 - + default by a counterparty
 - + credit spreads related to a reference asset
 - + downgrade by a rating agency
- ✖ Like other derivatives, credit derivatives allow for the isolation and transfer of a particular type of risk

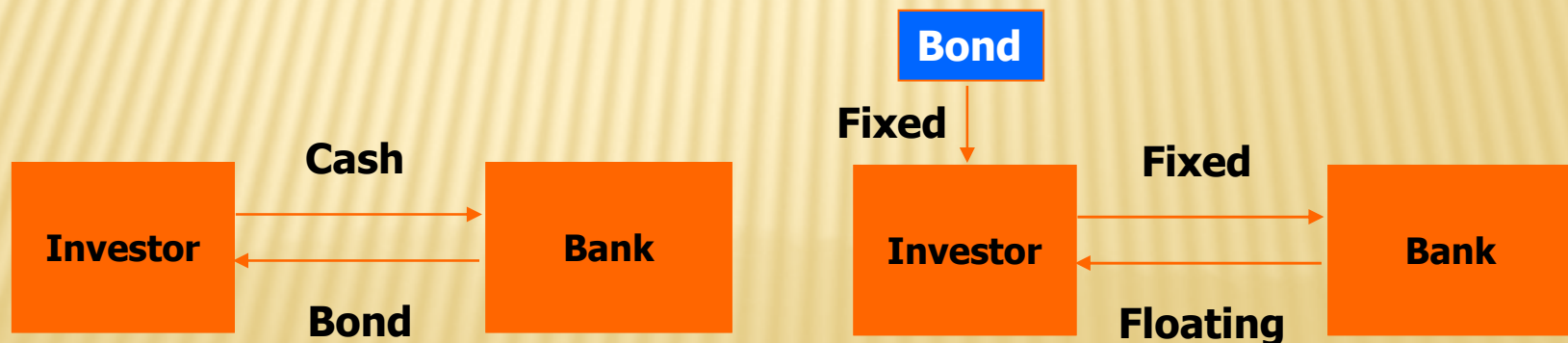
TOTAL RETURN SWAPS

- ✖ Total Return Swaps (TRS) are instruments that enable transfer of economic performance of an asset or a portfolio of assets for a pre-specified time.
- ✖ A TRS replicates the credit and market performance of a reference asset, be it a credit obligation or a portfolio.
- ✖ The difference between a TRS and a Default Swap is that while a Default Swap covers a reference entity or a reference obligation, a TRS covers a reference obligation only



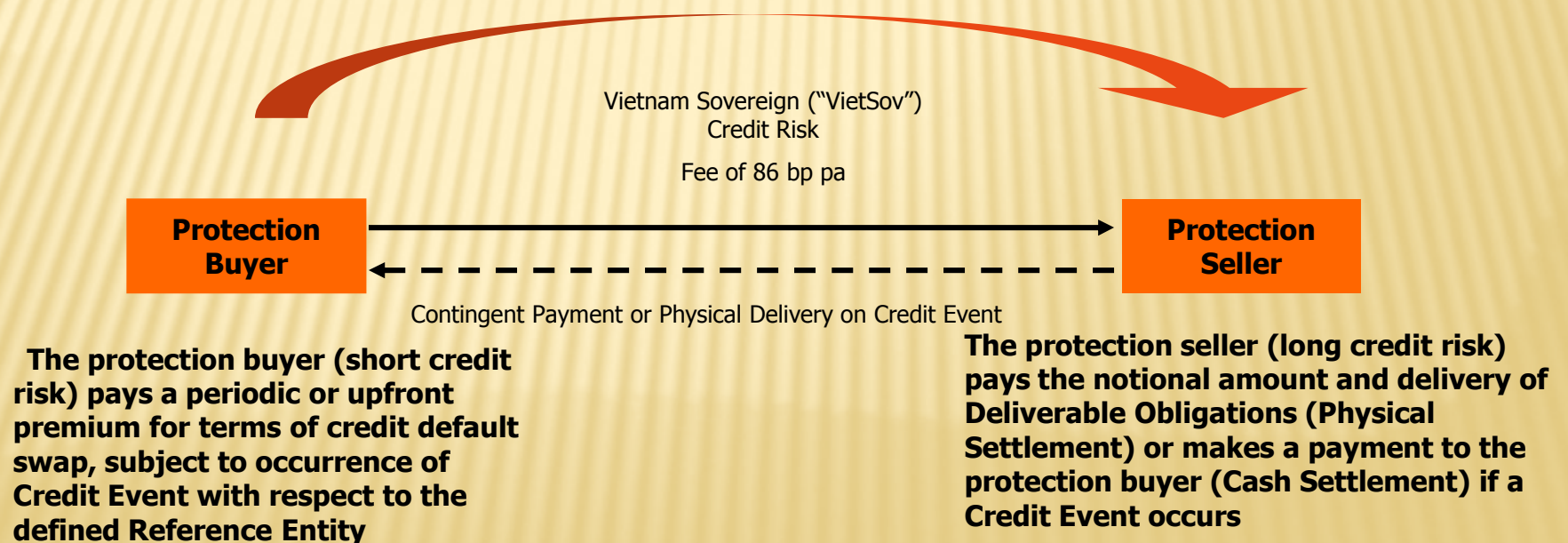
ASSET SWAPS

- ✗ Asset swap entails purchasing a fixed rate asset and simultaneously entering into a swap to convert fixed interest cash flows to floating.
- ✗ Investor's motive is to earn a credit spread on a fixed rate security while minimizing interest rate or market risk.
- ✗ Simple, transparent and flexible Structure.
- ✗ Sometimes the trade can have a call option on the bond sold by the investor (especially in the case of Convertible bonds).



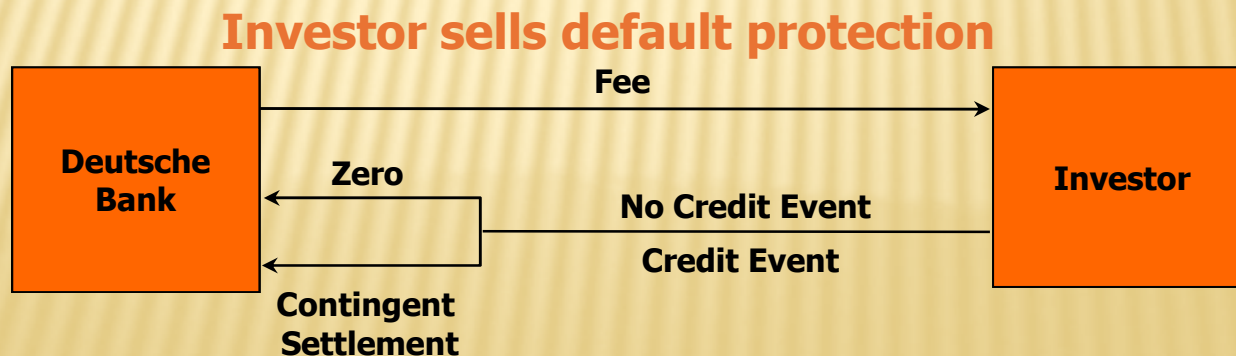
CREDIT DEFAULT SWAP

- ✗ CDS is a bilateral OTC agreement, which transfers a defined credit risk from one party to another
- ✗ CDS is analogous to insurance policy (or financial guarantee)



CREDIT DEFAULT SWAP

- ✗ A transaction which allows the transfer of the credit risk of a Reference Entity between counterparties in swap form
- ✗ Two parties enter into a swap agreement whereby
- ✗ the protection buyer pays a fixed periodic payment, usually expressed in basis points per annum on the notional amount, for the life of the agreement
- ✗ the protection seller makes no payments unless some specified credit event relating to a Reference Entity occurs, in which case the protection seller is obligated to make a contingent settlement

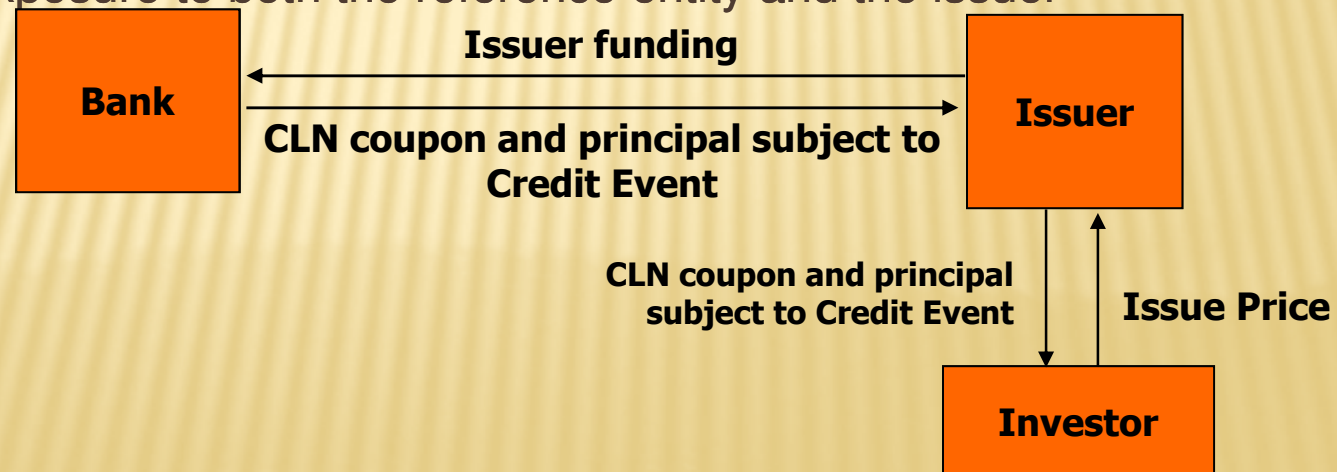


CREDIT DEFAULT SWAP

- ✖ Buyer of protection
 - + synthetically short a reference asset, credit, or portfolio
 - + hedge credit risk which otherwise cannot be sold due to tax, legal, accounting, or relationship reasons
 - + free up credit lines
- ✖ Seller of protection
 - + synthetically long a reference asset, credit, or portfolio
 - + access exposure which may be otherwise difficult due to legal or settlement restrictions
 - + leverage

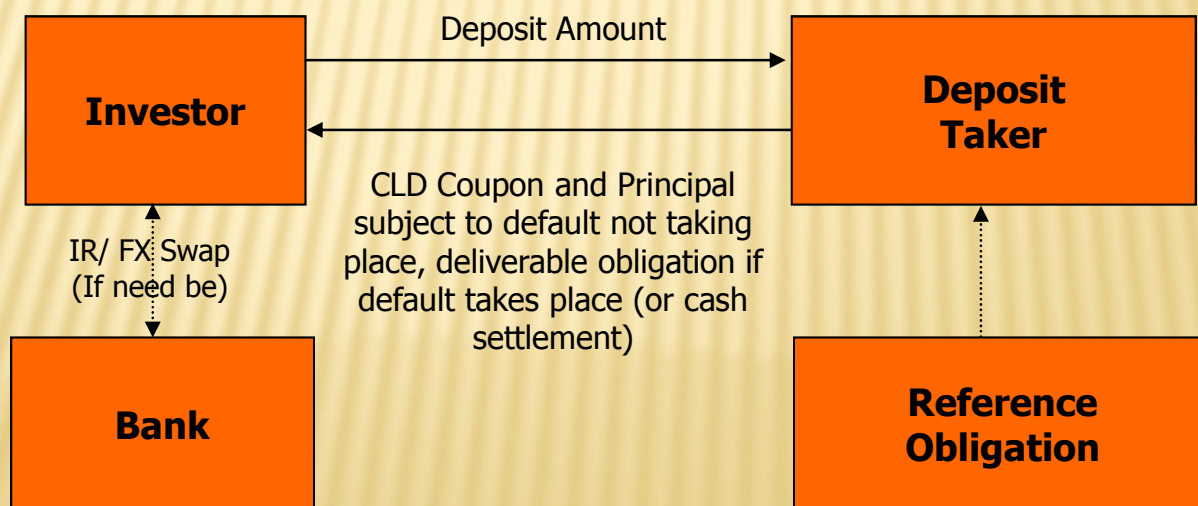
CREDIT LINKED NOTE

- ✗ Notes that have an embedded credit derivative which is tailored to satisfy investor requirements including maturity, currency, coupon, reference entity (credit), principal exposure, and issuer credit
- ✗ The credit linked note consists of:
 - + a coupon payout equal to the coupon from the issuer's note plus the fee from selling the default swap on the reference entity
 - + the repayment of the principal of the note is linked to the credit risk of the reference entity. If a credit event occurs, the notes will accelerate and there will be a credit event settlement. Thus investors have credit exposure to both the reference entity and the issuer



CREDIT LINKED NOTE / DEPOSITS

- ✗ Notes can be structured as Medium Term Notes or trust certificates
- ✗ Amount of principal redemption is linked to the recovery value of the Reference Obligations. In the event of default, principal redemption may be cash or physical delivery of the Reference Obligations
- ✗ In the case of no default, investors continue to have exposure to the issuer of the Medium Term Notes or the underlying collateral of the trust
- ✗ Notes can also be structured to provide 0 to 100% principal protection
- ✗ Credit linked Deposits can also be issued as shown below



HEDGING INTEREST RATE RISKS

- ✗ Concept of duration and PVBP allows us to understand the interest rate risks associated with holding a portfolio of interest rate derivatives (bonds/swaps etc)
- ✗ The perfect hedge would be to enter into an offsetting trade.
- ✗ Example: hedging a single swap
 - + Suppose the swap dealer just entered into a 5y swap with counterparty 1 to receive fixed rate. He can hedge perfectly by entering into a second swap of the same maturity where he pays the fixed rate. In this example, dealer has locked in a profit of 0.05% over 5 years. In reality, it is not easy to find the exact offset.



EXAMPLE: HEDGING A BOND PORTFOLIO AGAINST HIGHER INTEREST RATES

- **A bank has a sizeable amount of fixed-rate domestic government and corporate bonds in its asset portfolio.**
- **The client is concerned that interest rates have bottomed out and may begin to rise soon.**
- **To hedge against this scenario, the following factors must be considered:**
 - **Size of the portfolio**
 - **Liquidity in the bond market**
 - **Transactions costs**
 - **Available hedging instruments**
- **For some of these reasons, the sale or re-balancing of the bond portfolio is probably not optimal**
- **One solution is to hedge the interest rate risk in the swap market by paying fixed rate in a swap - thereby reducing the duration of the bond portfolio**

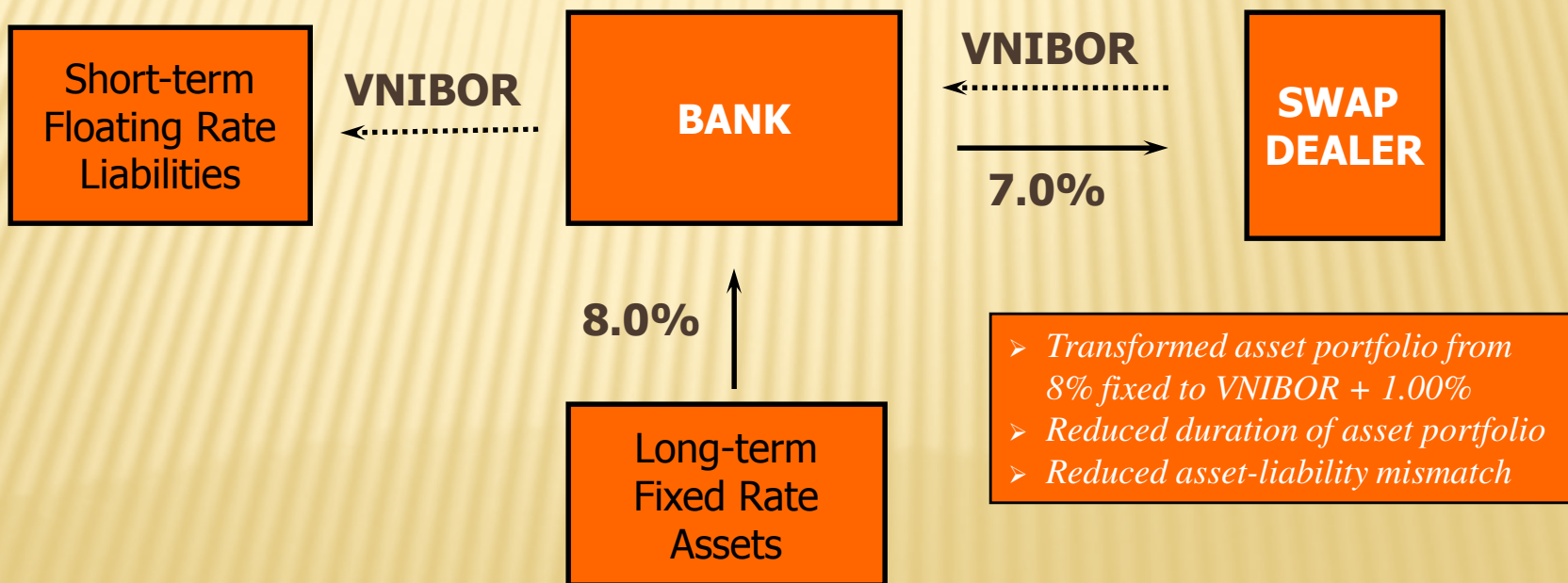
EXAMPLE: HEDGING A BOND PORTFOLIO AGAINST HIGHER INTEREST RATES



IRS APPLICATION 3: ASSET LIABILITY MANAGEMENT

✕ Scenario:

- + A bank is exposed to a significant gap risk. It has long-term fixed rate assets and short-term floating rate liabilities in its portfolio. It feels that interest rates may rise soon.
- + Create synthetic floating and fixed interest assets / liabilities to manage interest rate mismatch between assets and liabilities
- + Bank can enter into a swap and create a synthetic floating rate asset



ASSET SWAP APPLICATION

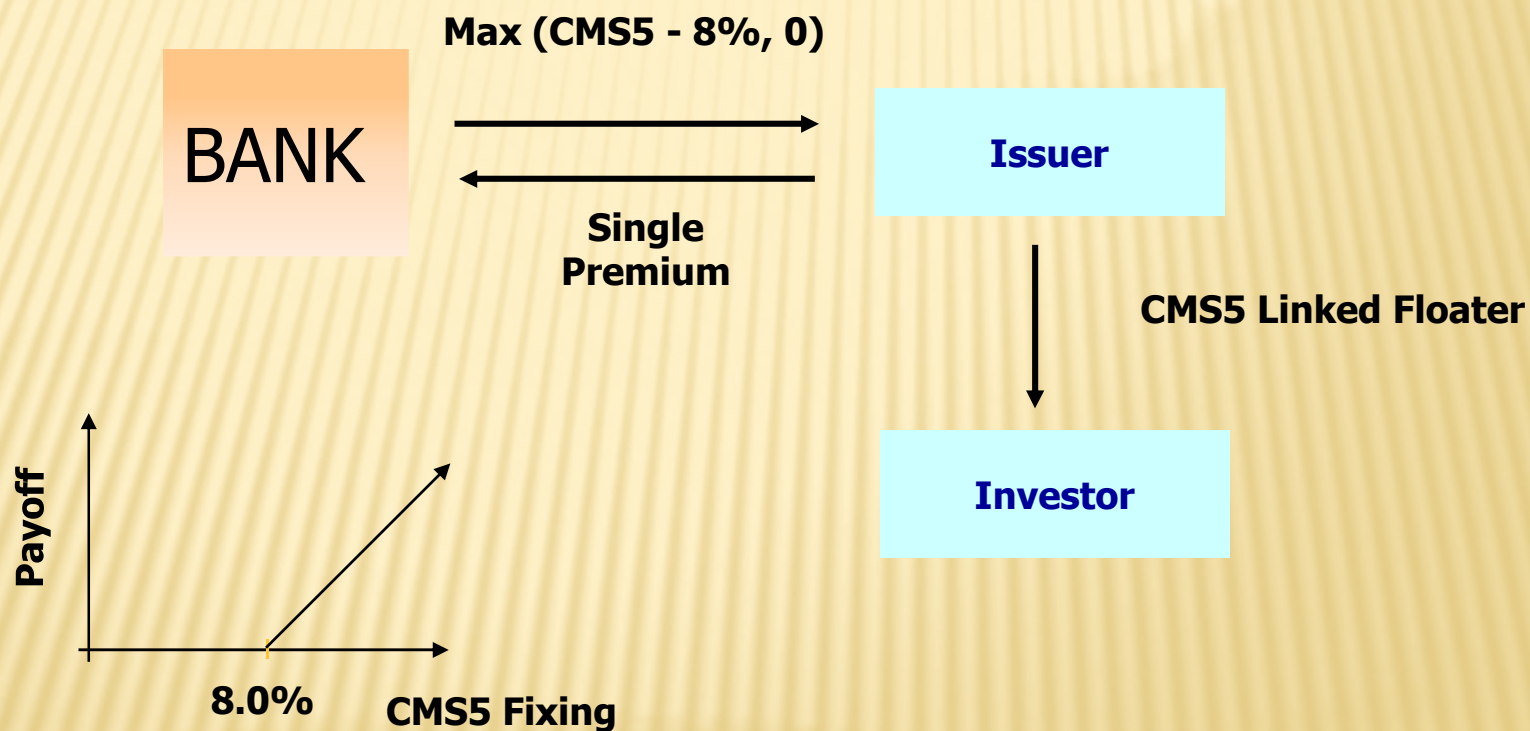
✖ Scenario:

- + An insurance company has bought a floating rate bond at an attractive yield. However, its liabilities are typically long-term and fixed rate. The insurer would like to convert the bond into a fixed-rate asset.
- + Insurance company can enter into an asset swap.
- + Insurer agrees to pay all the floating rate cash flow from the asset to the counterparty. It will receive fixed rate payments periodically.
- + An asset swap allows users to alter the characteristics of an asset while still maintaining ownership.
- + Fixed to floating or floating to fixed



INTEREST RATE CAPS AND FLOORS

✗ Example 2 (continued) - Purchasing a CMS5 Cap to hedge out an existing Floating Rate Issue



INTEREST RATE SWAPTIONS

- ✖ Option to enter into an Interest Rate Swap at a specific rate (the “strike”) on a specific date in the future
- ✖ Payers Swaption - buyer of swaption has the right to PAY a fixed rate and receive floating
 - + protection in case the yield curve rises
- ✖ Receivers Swaption - buyer of swaption has the right to RECEIVE a fixed rate and pay floating
 - + protection in case yield curve falls
- ✖ Difference Between Cap vs Swaption?
 - + Cap = strip of many options on an index with one fix
 - + Swaption = one option into a forward rate with many fixes

INTEREST RATE SWAPTIONS

- ✖ Example - Using a Payers Swaption to protect against a rise in swap rates and a steepening of the yield curve
- ✖ Company thinks that rates will remain low in Vietnam for the next year and wishes to continue paying floating on their 6 year liability. However they are concerned about a possible rise in rates from 1 years time.
- ✖ Company buys 1 year into 5 year PAYERS swaption, struck at 7.50% for a certain option premium.
- ✖ In 1 years time, if the then 5 year swap rate is above 7.5% Company can exercise right to pay 7.50% fixed against receiving floating.
 - + $\text{MTM Value} = (\text{Fix} - 7.50\%) \times \text{DV01 of 5 Year Swap} \times \text{Notional}$

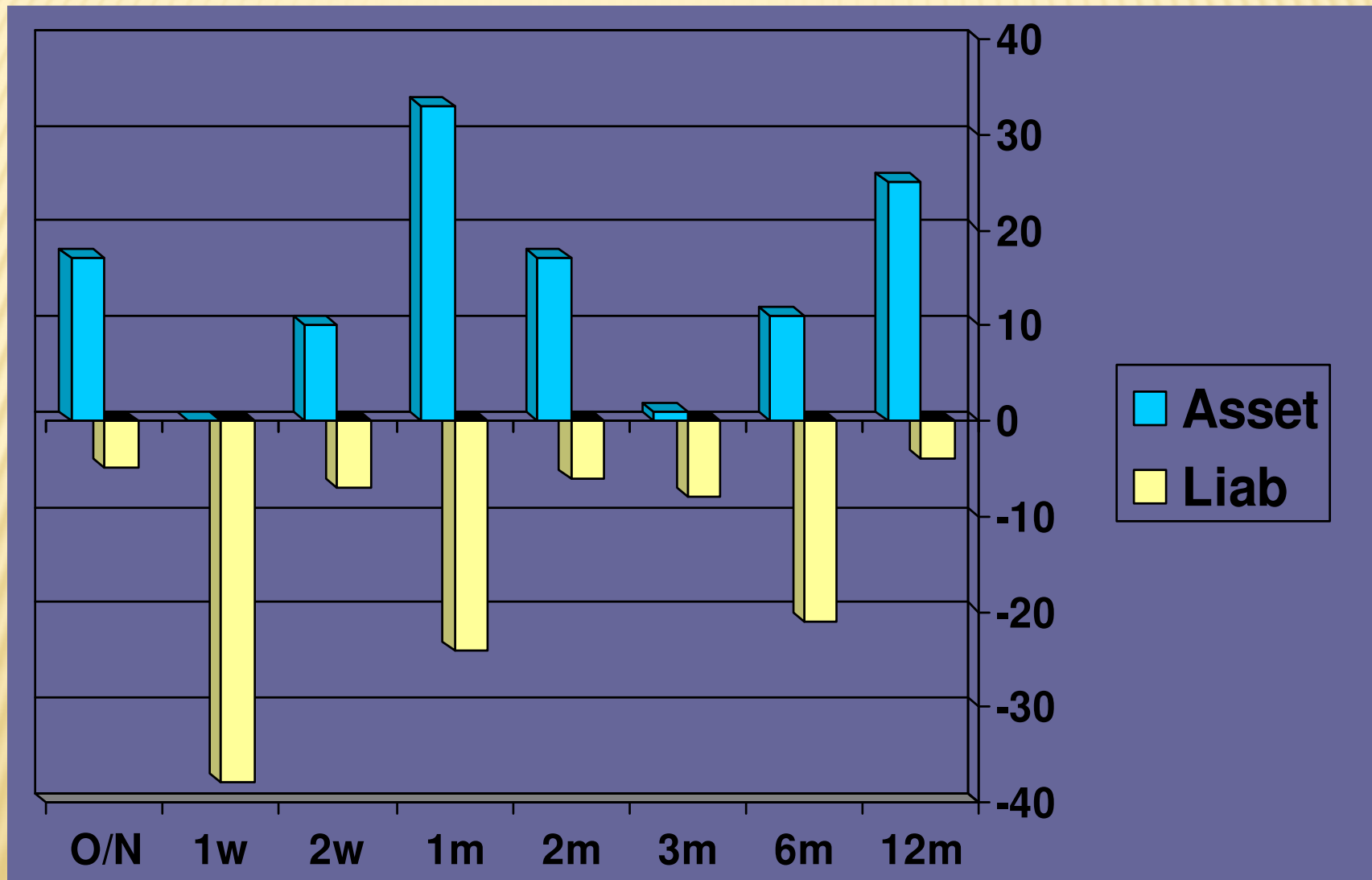
BALANCE SHEET LIMITS

- To manage the size & composition of b/s based on regulatory, capital, and funding consideration
 - Funding structure/diversification for optimal asset/liab mix
 - Allocation of funding to business units
 - Short-term funding for long-term loans
 - Liquidity ratio & Market dependence

BALANCE SHEET LIMITS GUIDELINE

- ❑ Market dependence (interbank)
 - Reduce dependency on wholesale market funds (interbank)
 - Includes interbank & Intergroup borrowing
 - Factors to consider - market size, market share, ability to raise funds in interbank market
 - Local Currency Limit
 - Foreign Currency Limit
 - A combined Limit
- ❑ Commitments Ratio
 - Undrawn Committed Lending Facilities as percent of Total Liabilities
 - General norm - 30 %
- ❑ Medium Term Mismatch Ratio
 - Contractual Cashflow mismatch over one year as a percent of total liabilities
 - Norm - 20 %
 - Exceptions possible

ASSET & LIABILITY PROFILE



MARGINING OR HAIRCUT

- ✖ Margining

The fact that the securities in a repo transaction can rise and fall in value means that some form of margin must be built in to protect the lender.

- ✖ In repo transactions, there are 2 types of margins :

- + Initial margin

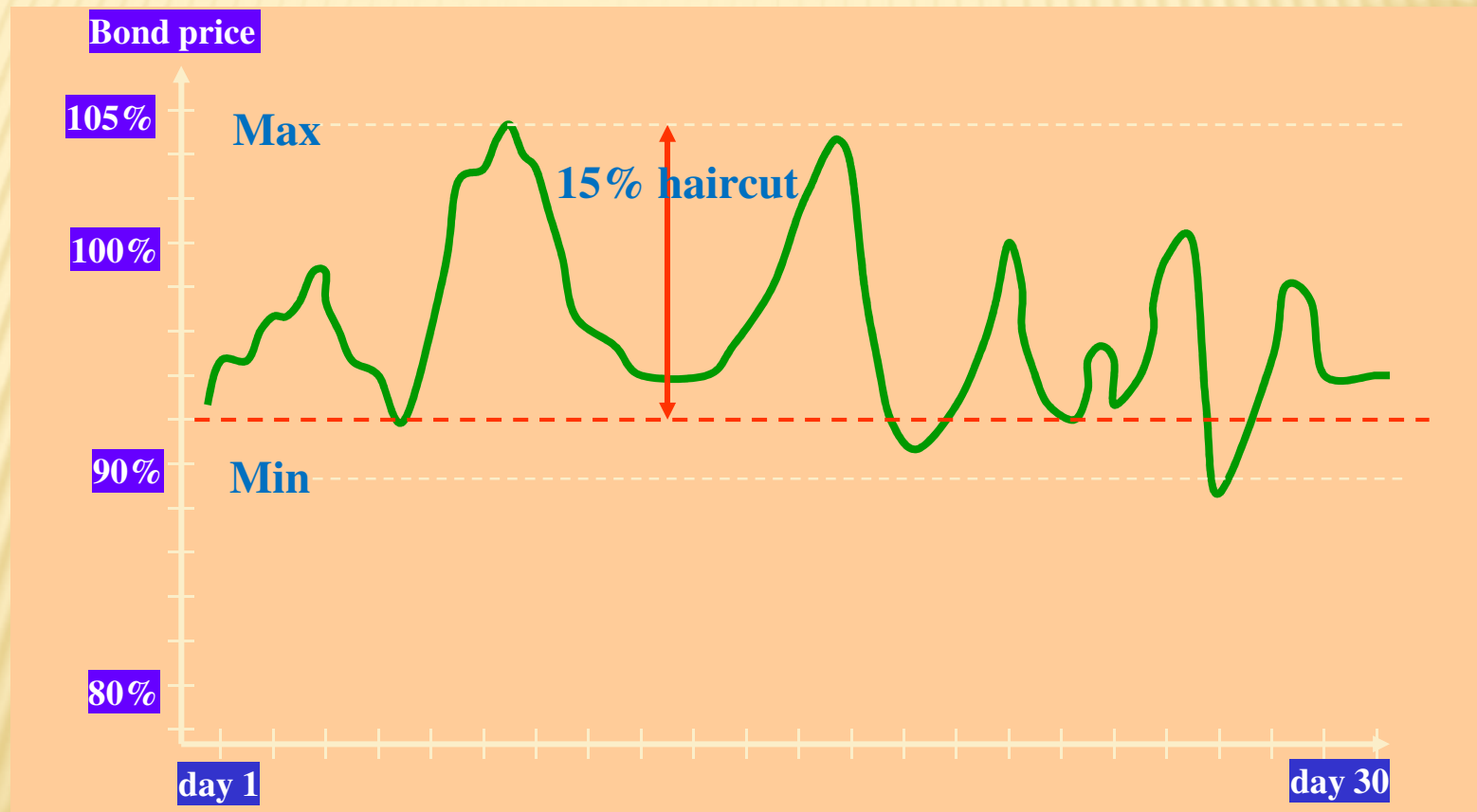
- initial margin (haircut) is the amount by which the value of the securities exceeds the amount of cash

- It is designed to provide one party to a repo transaction with a collective “ buffer” against future price movement.

- + Variation margin

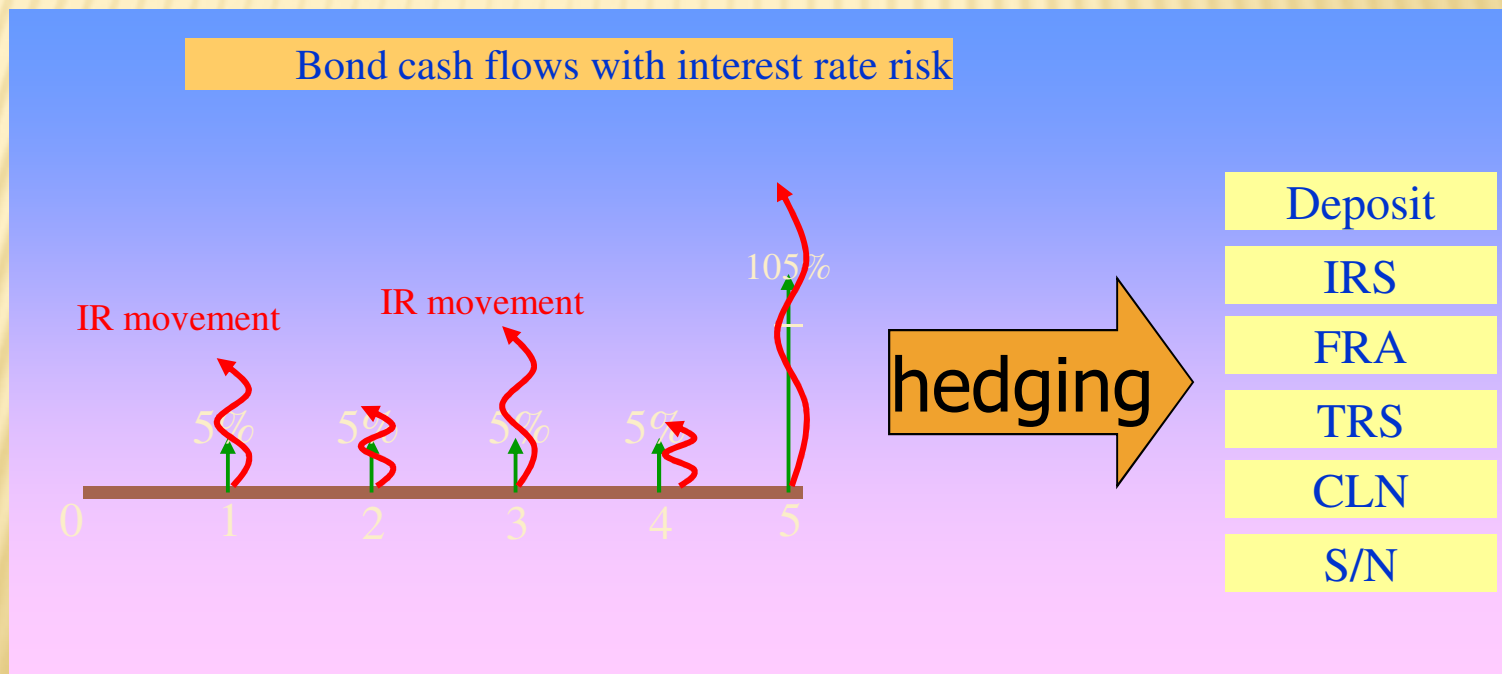
- Variation margin refers to the amount by which the value of the collateralised securities may fluctuate before a margin call will be triggered.

HAIRCUT



INTEREST RATE AND CREDIT RISKS ON THE BOND PORTFOLIO

- ✗ Long or short a bond will create an interest risk in portfolio. Hedging this risk can be done thru other products: Deposit, IRS, FRA, TRS, Credit link Notes, Structures notes



Part IV : Risk management Process

RISK MANAGEMENT PROCESS

- ✖ Identification - Risk/Opportunity
- ✖ Risk Quantification - VaR
- ✖ Portfolio Analysis
- ✖ Reporting and Control
- ✖ Performance Evaluation
- ✖ Portfolio Management

RISK MANAGEMENT PROCESS

- ✕ All these require the interaction of the following:
 - Risk Taker
 - Risk Control
 - Risk Function/Management

RISK TAKERS

- ✘ Risk Takers are responsible for identifying business opportunities and taking initial risk decisions and for the ongoing monitoring and performance of those decisions.
- ✘ Risk Takers have authority to execute transactions within authorized limits or authorities.

RISK CONTROL

- ✖ Risk Control is responsible for ensuring and reporting compliance to internal limits and regulations.

RISK FUNCTION/MANAGEMENT

- ✘ Risk Function is an independent unit responsible for establishing risk management policies and procedures.
- ✘ Risk Function is responsible for recommending risk allocation and portfolio management methodologies.

RISK TAKING INTENT/OBJECTIVES

- ✗ Balance Sheet Management
- ✗ Market Making
- ✗ Proprietary Trading
- ✗ Investment Management

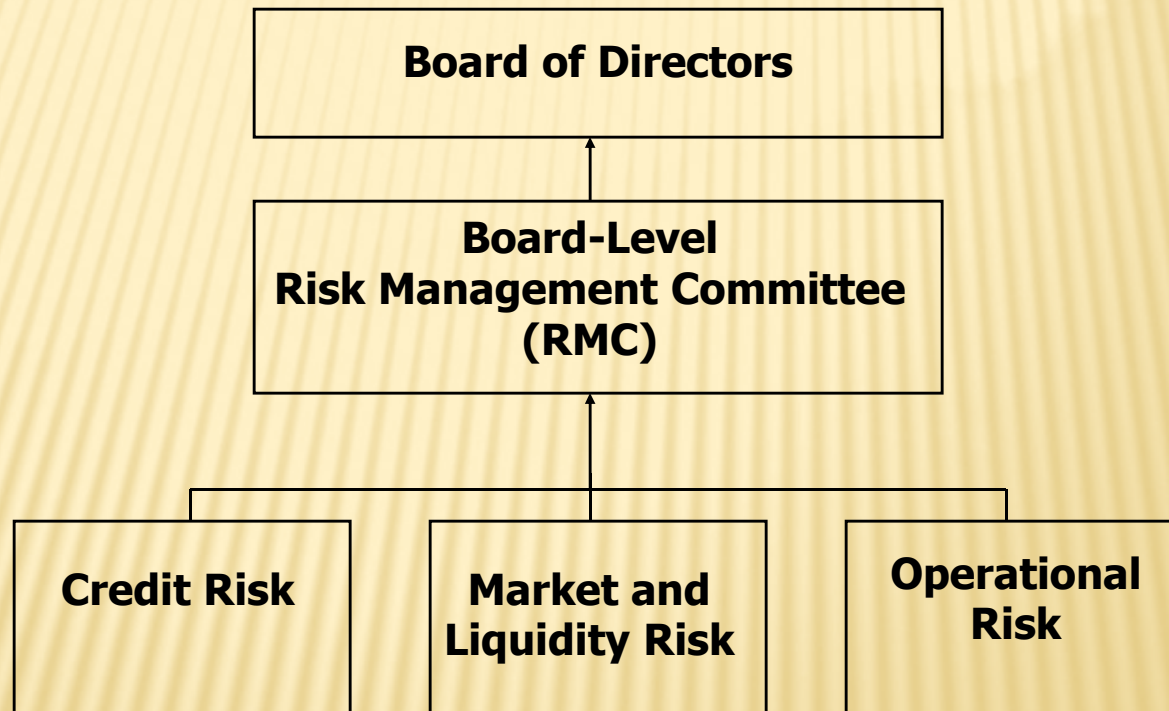
RISK TAKING INTENT/OBJECTIVES

- ✘ Balance Sheet Management: pertains to the core financial and cash management activities.
 - + Leveraging; Interest Rate Mismatch; Cross Border Funding
- ✘ Market Making: providing two-way quotations for financial transactions
 - + Customer Orientation

RISK TAKING INTENT/OBJECTIVES

- ✘ Proprietary Trading: pre-identified tactical positions to profit from correctly assessing future market movements or pricing discrepancies.
 - + Own position; Arbitraging
- ✘ Investment Management: fiduciary management of others' assets.

BOARD OVERSIGHT OVER THE RISK MANAGEMENT PROCESS



ORGANIZATION OF TRADING ACTIVITIES

Principle in the control/management of risk in trading activities is the separation of below functions:

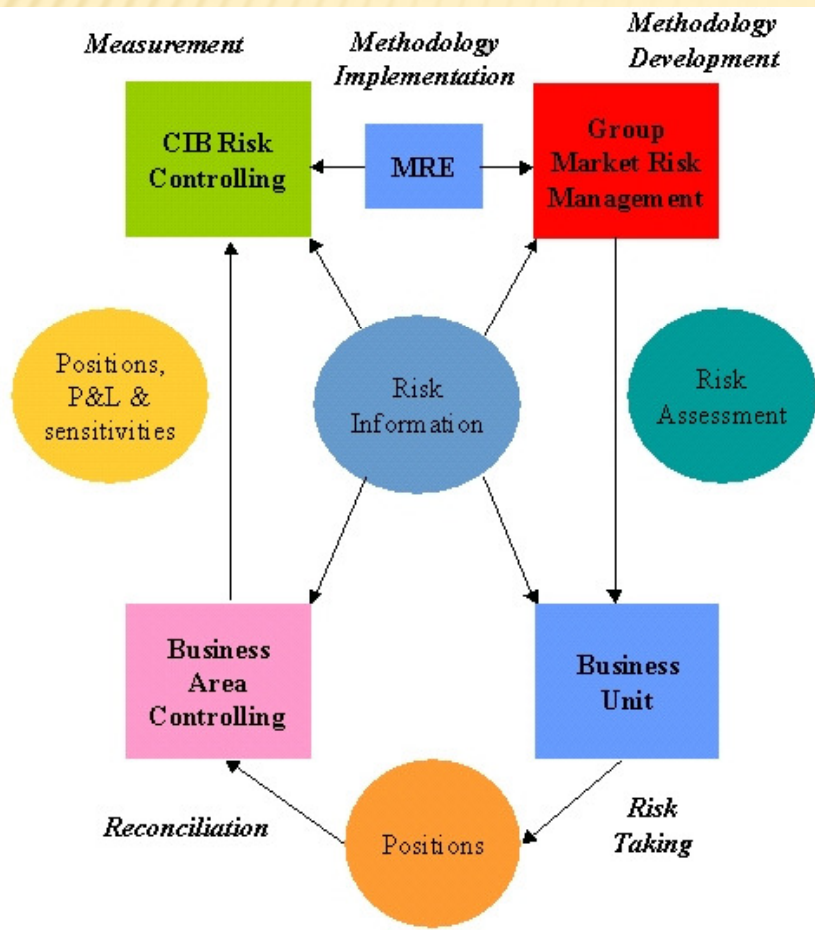
- ✖ Trading: A transaction can be executed by many different means (telephone conversation, electronic message exchange, etc.).

Any transaction must fall within applicable market risk policies, financial and other economic limits set by the Bank and other regulators

ORGANIZATION OF TRADING ACTIVITIES (CONT)

- ✖ Back office processing and control;
On the basis of the business documents obtained from the traders, the back office must write the necessary confirmations and contract notes and attend to the other processing formalities.
- ✖ Accounting;
- ✖ Monitoring.
The risks arising from trading activities are to be monitored in a timely fashion by a member of senior management.

MARKET RISK & RISK PROCESS



Risk Control:

Market risk is monitored and reported by Business Risk Controlling.

Risk Control utilises a Value-At-Risk ("VAR") model and a PV01 model, which provides a statistically based measure of the risk of a portfolio.

NEW PRODUCTS APPROVAL PROCESS

- ✕ Product Programme Key Sections
 - + Product Description
 - + Customer Base
 - + Product Risk/Return Evaluation
 - + Transaction Processing
 - + Product Documentation

NEW PRODUCTS APPROVAL PROCESS

- ✕ Product Programmed Key Sections
 - + Accounting Procedures
 - + Risk Management
 - + Tax Approvals
 - + Legal, Regulatory and Compliance

CREDIT RISK PROCESS

- ✖ Group Credit Risk Management is responsible for:
 - + Development and approval of methodologies and policies regarding credit risk and exposure measurement;
 - + Counterparty limit setting;
 - + Counterparty exposure management;
 - + Authorising any exceptions to existing credit risk policies.

CREDIT RISK PROCESS

- ✘ The counterparty limits are determined independently of trading personnel and be done in line with the rules and procedures for the granting of loans, and must take into account any changes in the financial standing of the counterparties.
- ✘ Credit exposure utilization report v.s limits.....
 - Settlement risk report for cpty
 - PFE utilization report for cpty

DOCUMENTATION

- ✖ Good documentation helps
 - + ISDA/GMRA will enable netting and set-off
 - + Under CSA all trades are constantly valued and additional collateral is placed the Bond Lender