

**Integrity, Service, Excellence**

**SCHOOL OF LEADERSHIP AND BUSINESS MANAGEMENT**

**FINANACIAL RISK MANAGEMENT**

BACHELOR OF ACCOUNTING AND FINANACE/BANKING AND FINANCE/ BUSINESS ADMINISTRATION

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**AUTHOR: MR A MALUBILA**

**MBA-FINANCE (CBU), BSc BANKING & FINANCE (CBU), Dip-Mat (COSETCO)**

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**OBJECTIVES**

1. To equip students with the basic knowledge of Financial risk management
2. To help student understand and identify the risks faced by financial institutions
3. To help students to evaluate and analyse risks and how to mitigate them using various tools and techniques
4. To provide an understanding of techniques of good lending assessment

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#

# **UNIT 1: ACADEMICBACKGROUND AND TECHNOLOGICALCHANGES IN RISK MANAGEMENT**

Risk management cannot be understood independently of the ‘body of academic research published on risk management techniques and derivative valuation that has evolved since the early 1950s. A common deﬁciency in risk management systems and policy proposals is the lack of a firm theoretical foundation (and therefore consistency). In this unit we review some of the key theories and models, and show how they relate to the development of approaches to risk management in banking. However, it is worth making clear at the outset that the theoretical work on risk management is based on many simplifying assumptions, and that the implementation of theoretical work is not always straightforward. Real life complicated and is composed of many details that models cannot, and may!-u; should not, accommodate. Instead, the role of models is often to simply, complicated structures and to highlight the most important factors. A "good” .ﬁnancial model is one that helps the analyst separate out the major explanation variables from a noisy background.Milton Friedman, in his seminal article "The Methodology of Positive Economy 1953), emphasizes that a model can be only evaluated in terms of its predicted power. It cannot be evaluated in terms of the assumptions employed, or in terms whether the model seems to be sufﬁciently complicated to capture all the relevant details from "real life." ‘In other words, a model can be simple, and yet be judged successful if it helps in predicting the future and in improving the efficiency the decision-making process.

The word "risk" has many meanings and connotations." It is widely used professional traders, risk managers, and the public. Many articles in newspapers and magazines talk about risky and choppy markets. They warn their readers investing "too much" in "risky assets”, and they wonder whether ﬁnancial mark have become "too risky" and volatile. A proliferation of names has emerged to describe the various risks: business risk, ﬁnancial risk, market risk, liquidity risk, default risk, systematic risk, specific risk, residual risk, credit risk, counterparty risk, operations risk, settlement risk, country risk, portfolio risk, systemic risk, legal risk, reputational risk, and more.

The foundations of modem risk analysis are contained in Markowitz's (1952) paper concerning the principles of portfolio selection. Markowitz showed that a rational investor, ie., an investor who behaves in a way that is consistent with Von Neuman - lorgenstern's expected utility maximi2.ation, should analyse alternative portfolios based on their mean and on the variance of their rates of return Markowitz makes two additional assumptions, first, that capital markets are perfect, and second that the rates of return are normally distributed.

Since the utility choices of a consumer can be expressed in terms of two parameters only—mean and variance portfolios of investments can also be presented :or selection according to these two parameters. Note that the two-parameter presentation, while valid for well-diversiﬁed portfolios, does not apply to individual securities. A security should be evaluated only in the context of the portfolio of investments to which it belongs, through its Contribution to the mean and variance of the portfolio. More speciﬁcally, the risk of a single investment should be measured in terms of the variability of its rate of return with the rate of return of the portfolio.

Markowitzs portfolio analysis suggests that the speciﬁc or idiosyncratic risk of single security (i.e., the elements of its risk profile that it does not share with other investments) should not be measured in terms of its volatility as measured by the variance of the rates of return, The variance measures the potential dispersion of future rates of return, but this is not a relevant risk measure for a single Security This is because most of the speciﬁc risk due to volatile returns can easily by diversiﬁed away and eliminated at virtually no cost. It follows that the speciﬁc risk, or idiosyncratic risk, of a security, should not be priced in the marketplace if it can easily be offset against the returns of other securities.

Sharpe (1964) and Lintner (1965) take the portfolio approach one step further by adding the assumption that a risk-free asset exists. They show that ﬁnancial markets are in equilibrium when all investors hold a combination of a riskless asset and the market portfolio of all risky assets in the economy. Therefore, prices of risky assets are determined in such a way that they are included in the market portfolio. They show that in order to be 'in" the market portfolio, a risky asset must be priced according to its relative contribution to the total risk of the market portfolio, as measured by the variance of its rate of return distribution.

The next important development in the analysis of risk occurred in 1973, with the publication of two seminal papers by Fischer Black and Myrcn Scholes, and Robert Merton, on the pricing of options. The papers make use of a framework similar to that used by Markowitz, Sharpe, and Lintner; namely, they assume the existence of perfect capital markets and assume that security prices are lognormally distributed or equivalently, that log-returns are normally distributed. To these, they add the new assumptions that trading in all securities is continuous and that the distribution of the rates of return is stationary. Fischer Black and Myron Scholes come up with the Black—Scholes (BS) option pricing model. The model will be discussed in detail in later units.

In order to complete this brief introduction to the theoretical basis of modern risk management, we must turn to the work Franco Modigliani and Merton Miller published in 1958. These academics showed that in a perfect capital market, with no corporate and income taxes, the capital structure of a firm has no effect on the’ value of the ﬁrm. A corporation cannot increase its value by issuing more debt, despite the fact that the expected cost of debt is lower than the expected cost of

equity. Instead, the greater leverage in the capital structure in the ﬁrm, brought about by the increased level of indebtedness, means that the equity holders immediately face a greater level of ﬁnancial risk. Naturally, they will demand compensation for this in the form of higher rates of return.

This implies that management should concentrate on identifying and implementing investments that will increase the economic value of the ﬁrm, rather reengineering the capital structure of the firm. The cost of capital of the ﬁrm, which is equal to the weighted cost of equity and debts, is important mainly in the sense that it offers a marginal "hurdle rate" for management in their evaluation of new investment.

Many of the contributors to the intellectual framework that we have just sketched out were eventually awarded the Nobel Prize. Their fundamental results will accompany us throughout this book, providing an essential framework for risk analysis and evaluation.

#

# **UNIT 2: RISK IN OUR SOCIETY**

Risk is the uncertainty concerning the occurrence of a loss. It is the probability that a firm is likely to incur extra costs as a result of unexpected circumstances. Risk occurs because a Firm is exposed to a loss exposure. Loss exposure is any situation or circumstance in which a loss is possible, regardless of whether a loss occurs.

**Objective Risk vs. Subjective Risk**

Objective risk is deﬁned as the relative variation of actual loss from expected loss. It can be statistically calculated using a measure of dispersion, such as the standard deviation. Subjective risk is deﬁned as uncertainty based on a person’s mental condition or state of mind. Two persons in the same situation may have different perceptions of risk. High subjective risk often results in conservative behavior.

 **Chance of loss**

 Chance of loss is the probability that an event will occur. There are two types of chances of loss, objective probability and subjective Probability.

Objective probability refers to the long-run relative frequency of an event, assuming an infinite number of observations and no change in the underlying conditions. It can be determined by deductive or inductive reasoning. Subjective probability is the individual’s personal estimate of the chance of loss. A person’s perception other chance of loss may differ from the objective probability.

**Peril and Hazard**

A peril is defined as the cause of the loss. In an auto accident, the collision is the peril. A hazard is- a condition that increases the chance of loss. The following are the types of hazards:

* Physical hazards are physical conditions that increase the chance of loss (ice roads, defective wiring);
* Moral hazard is dishonesty or character defects in an individual, the increase the chance of loss'(faking accidents, inﬂating claim amounts);
* Attitudinal Hazard (Morale Hazard) is carelessness or indifference to a loss, which increases the frequency or severity of a loss (leaving keys in an unlocked ear);
* Legal Hazard refers to characteristics of the legal system or regulatory environment that increase the chance of loss (large damage awards in ‘liability lawsuits).

**Classification of Risk**

* Pure and Speculative Risk –
* A pure risk is one in which there are only the possibilities of loss or no loss (earthquake).
* A speculative risk is one in which both proﬁt or losses are possible ‘(gambling).
* Diversifiable Risk and None diversiﬁable Risk
* A diversiﬁable risk affects only individuals or small groups (car theft‘). It is also called none systematic or particular risk.
* A non diversiﬁable risk affects the entire economy or large numbers of persons or groups within the economy (hurricane). It is also called systematic risk or [fundamental risk.)
* Government assistance may be necessary to insure none diversifiable risks.

**Major Personal and commercial risks**

Enterprise risk encompasses all major risks faced by\_ it business ﬁrm, which include: pure risk, speculative risk, strategic risk, operational risk, and financial risk. Financial Risk refers to the uncertainty of loss because of adverse changes in commodity prices, interest rates, foreign exchange rates, and the value of money. Enterprise Risk Management combines into a single uniﬁed treatment program major risk faced by the firm:

* Pure risk
* Speculative risk
* Strategic risk
* Operational risk
* Financial risk

Personal risks involve the possibility of a loss or reduction in income, extra expenses or depletion of financial assets:

* Premature death of family head;
* Insufficient income during retirement - Most workers are not saving enough for a comfortable retirement;
* Poor health (catastrophic medical bills and loss of earned income);
* Involuntary unemployment. Property risks involve the possibility of losses associated with the destruction or theft of property. This can include physical damage to home and personal property from ﬁre, tornado, vandalism, or other causes.

**Direct loss vs. indirect loss**

A direct loss is a ﬁnancial loss that results from the physical damage, destruction, or theft of the property, such as ﬁre damage to a home. An indirect loss results indirectly from the occurrence of a direct physical damage or theft loss, such as the additional living expenses after a ﬁre to a home. These additional expenses would be a consequential loss.

Liability risks involve the possibility of being held liable for bodily injury or property damage to someone else. There is no maximum upper limit with respect to the amount of the loss. A lien can be placed on your income and ﬁnancial assets and defense costs can be enormous.

**Commercial Risks**

Firms face a variety of pure risks that can have serious ﬁnancial consequences if a loss occurs:

* Properly risks, such as damage to buildings, furniture and office equipment.
* Liability risks, such as suits ‘for defective products, pollution of the environment, and sexual harassment;
* Loss of business income, when the ﬁrm must shut down for some time after a physical damage loss;
* Other risks to ﬁrms include crime exposures, human resource exposures, foreign loss exposures, intangible property exposures, and government exposures.

**Burden of Risk on Society**

The presence of risk results in three major burdens on society:

* In the absence of insurance, individuals would have to maintain large emergency my funds.
* The risk of a liability lawsuit may discourage innovation, depriving society of certain goods and services.
* Risk causes worry and fear

**Techniques for Managing Risk**

There are ﬁve major methods for managing risk:

1. Avoidance

This is where a firm does not take up any transaction that carries a risk.

1. Loss control

Under loss control a risk manager has two options:

* Loss prevention refers to activities to reduce the frequency of losses.
* Loss reduction refers to activities to reduce the severity of losses
1. Retention

This is where an individual or firm retains all or part of a given risk. The following are the types of risk retention:

* Active retention means that an individual is consciously aware of the risk and deliberately ‘plans to retain all or part of it.
* Passive retention means risks may be unknowingly retained because of ignorance, indifference, or laziness.
* Self-Insurance is a special form of planned retention by which part or all of a given loss exposure is retained by the ﬁrm
1. **Noninsurance transfers**

A risk may be transferred to another party by several methods:

* A transfer of risk by contract, such as through a service contract or a hold-harmless clause in a contract;
* Hedging is a technique for transferring the risk of unfavorable price fluctuations to a speculator by purchasing and selling futures contracts on an organized exchange;
* Incorporation of a business ﬁrm transfers to the creditors the risk of having insufficient assets to pay business debts.
1. Insurance

For most people, insurance is the most practical method for handling a major risk.

# **UNIT 3: THE RISK MANAGEMENT PROCESS**

**Meaning of Risk Management**

Risk Management is a process that identifies loss, exposures faced by an organization and selects the most appropriate techniques for treating such exposures. Remember that a loss exposure is any situation or circumstance in which a loss is possible, regardless of whether a loss occurs, e.g., a plant that may be damaged by an earthquake, or an automobile that may be damaged in a collision. New forms of risk management consider both pure and speculative loss exposures.

**Objectives of Risk Management**

Risk management has objectives before and after a loss occurs;

1. Pre-loss objectives:
* To prepare for potential losses in the most economical way;
* To r:duce anxiety;
* To meet any legal obligations.
1. Post-loss objectives:
* Ensure survival of the firm; - Continue operations;
* Stabilize earnings;
* Maintain growth;
* Minimize the effects that a loss will have on other persons and on society.

**Risk Management Process**

The risk management process has the following steps:

* Identify potential losses;
* Management and analyze the loss exposures;
* Select the appropriate combination of techniques for treating the low exposures;
* Implement and monitor the risk management program.

Identify loss exposures

Measure and analyze the loss exposures

Select the appropriate combination of technique of treating the loss exposures

1. Risk Control
* Avoidance
* Loss prevention
* Loss reduction
1. Risk Financing
* Retention
* None insurance transfers
* Commercial insurance

Implement and monitor the risk management program

Fig 3.1 Steps in the Risk Management Process

Step 1: Identifying loss exposures

The following are the loss exposures:

* Property loss exposures’
* Liability loss exposures
* Business income loss exposures
* Human resources loss exposures
* Crime loss exposures
* Employee beneﬁt loss exposures
* Foreign loss exposures
* Intangible property loss exposures
* Failure to comply with government rules and regulations

Risk Managers have several sources of information to identify loss exposures:

* Questionnaires
* Physical inspection
* Flowcharts
* Financial statements
* Historical loss data

Industry trends and market changes can create new loss exposures, e.g., exposure to acts of terrorism.

**Step 2: measuring and analyze loss exposures**

Analyzing loss exposure can involve estimating the frequency and severity of loss for each two of loss exposure:

* Loss frequency refers to the probable number of losses that may occur during some given time period.
* Loss severity refers to the probable size of the losses that may occur.

Once loss exposures are analyzed, they can be ranked according to their relative; importance. Loss severity is more important than loss frequency:

* The maximum possible loss is the worst loss that could happen to the firm during its lifetime.
* The ‘probable maximum loss is the worst loss that is likely to happen.

**Step 2: Selecting the appropriate combination of techniques for treating the loss exposures**

* There are two types of techniques for treating loss exposure: risk control and risk ﬁnancing.
1. **Risk Control** refers to techniques that reduce the frequency and severity of losses. Methods of risk control include:
* Avoidance
* Loss prevention
* Loss reduction

**Avoidance** means a certain loss exposure is never acquired, or an existing loss exposure is abandoned. The chance of loss is reduced to zero and it is not always possible, or practical, to avoid all losses.

**Loss prevention** refers to measures that reduce the frequency of a particular loss e.g., installing safety features on hazardous products.

**Loss reduction** refers to measures that reduce the severity of a loss after is occurs e.g., installing an automatic sprinkler system.

**Step3: Selecting the appropriate risk management technique**

Risk’ ﬁnancing refers to techniques that provide for the funding or losses. Methods of risk ﬁnancing include:

* Retention
* Non-insurance Transfers
* Commercial Insurance

**Retention** means that the ﬁrm retains part or all of the losses that can result from a given loss. Retention is effectively used when no other method of treatment is; available; the Worst possible loss is not serious and losses are highly predictable. The retention level is the dollar amount of losses that the ﬁrm win retain. A financially strong firm can have a higher retention level than a financially weak firm. The maximum retention may be calculated as a percentage of the firm’s net working capital. A risk manager has several methods for paying retained losses:

* Current net income: losses are treated as current expenses;
* Unfunded reserve: losses are deducted from a bookkeeping account;
* Funded reserve: losses are deducted from a liquid fund;
* Credit line: funds are borrowed to pay losses as they occur;
* A captive insurer is an insurer owned by a parent ﬁrm for the purpose of insuring the parent ﬁrm’s loss exposures. A single-parent captive is owned by only one parent. An association or group captive-is an insurer owned by several parents. Many captives are located in the Caribbean because the regulatory environment is favorable. A risk retention group is a group captive that can write any type of liability coverage except employer liability, workers compensation, and personal lines. Captives are formed for several reasons, including:
	+ The parent ﬁrm may have difficulty obtaining insurance;
	+ To take advantage of a favorable regulatory environment;
	+ Costs may be lower than purchasing commercial insurance;
	+ A captive insurer has easier access to a reinsurer;
	+ A captive insurer can become a source of proﬁt;
	+ Premiums paid to a captive may be tax-deductible under certain conditions.
* Self-insurance is a special form of planned retention. Part or all of a given loss exposure is retained by the firm. Another name for self-insurance self- funding. Self-funding is widely used for workers» compensation and group health beneﬁts.

**Advantages of retention**

* Save on loss costs
* Save on expenses
* Encourage loss prevention
* Increase cash flow

**Disadvantages of retention**

* Possible higher losses
* Possible higher expenses
* Possible higher taxes
1. **Risk Financing** – Risk ﬁnancing involves non-insurance and insurance transfers.

**A non-insurance transfer** is a method other than insurance by which a pure risk and its potential ﬁnancial consequences are transferred to another party. Examples includes contracts, leases, hold-harmless agreements etc.

Advantages of non- insurance transfers:

* Can transfer some losses that are not insurable;
* Save money;
* Can transfer loss to someone who is in a better position to control losses.

Disadvantages of non-insurance transfers:

* Contract language may be ambiguous, so transfer may fail;
* If the other party fails to pay, ﬁrm is still responsible for the loss;
* Insurers may not give credit for transfers.

**Insurance** is appropriate-for loss exposures that have a low probability of loss but for which the severity of loss is high. The risk manager selects the coverage’s needed, and policy provisions. A deductible is a provision by which a speciﬁed amount is subtracted from the loss payment otherwise payable to the insured. An excess insurance policy is one in which the insurer does not participate in the loss until the actual loss exceeds the amount a ﬁrm has decided to retain. The risk manager selects the insurer, or insurers, to provide the coverage’s. The risk manager negotiates the terms of the insurance contract. A manuscript policy is a policy specially tailored for the firm. Language in the policy must be clear to both parties.

The parties must agree on the contract provisions, endorsements, forms, and premium. The risk manager must periodically review the insurance program.

**Advantages of Insurance**

* Firm is indemniﬁed for losses
* Uncertainty is reduced
* Insurers may provide other risk management services
* Premiums are tax-deductible

**Disadvantages of Insurance**

* Premiums may be costly
* Opportunity cost should be considered
* Negotiation of contracts takes time and effort
* The risk manager may become lax in exercising loss control

**Market Conditions and the Selection of Risk Management Techniques**

Risk managers may have to modify their choice of techniques depending on market conditions’ in the insurance markets. The insurance market experiences an underwriting cycle. In a “hard” market, when proﬁtability is declining, underwriting standards are tightened, premiums increase, and insurance becomes more difficult to obtain. In a “soft market, when proﬁtability is improving, standards are loosened, premiums decline, and insurance become easier to obtain

**Step 4: Implement and Monitor the Risk Management Program**

Implementation of a risk management program begins with a risk management policy statement that:

* Outlines the ﬁrm’s risk management objectives
* Outlines the ﬁrm’s policy on loss control
* Educates top-level executives in regard to the risk management process
* Gives the risk manager greater authority
* Provides standards for judging the risk manager’s performance

 A risk management manual may be used to describe the risk management program and train new employees. A successful risk management program requires active cooperation from other departments in the firm. The risk management program should be periodically reviewed and evaluated to determine whether the objectives are being attained. The risk manager should compare the costs and beneﬁts of all risk management activities

**Beneﬁts of Risk Management**

The following are the beneﬁts of risk management:

* Pre-loss and post-loss objectives are attainable.
* A risk management program can reduce a firm’s cost of risk. The cost of risk includes premiums paid, retained losses, outside risk management services, ﬁnancial guarantees, internal administrative costs, taxes, fees, and other expenses.
* Reduction in pure loss exposures allows a firm to enact an enterprise risk management program to treat both pure and speculative loss exposures.
* Society beneﬁts because both direct and indirect losses are reduced.

**Personal Risk Management**

* Personal risk management refers to the identification of pure risks faced by an individual or family, and to the selection of the most appropriate technique for treating such risks. The same principles applied to corporate risk management apply to personal risk management.

**UNIT 4: RISK, RETURN AND THE OPPORTUNITY COST OF CAPITAL**

Opportunity seat of capital depends on the risk of the project. Thus, to be able to determine the: opportunity cost of capital one must understand how to measure risk and how investors are compensated for taking risk.

**Risk and risk premium**

The risk premium on ﬁnancial assets compensates the investor for taking risk. The risk premium is the difference between the return on the security and the risk free rate. To measure the average rate of return and risk premium on securities one has to look at very long time period to eliminate the potential bias from ﬂuctuations over short intervals. Over the last 100 years U.S. common stocks have returned an average annual nominal compounded rate of return of 10.1% compared to 4.1% for U.S. Treasury bills. As U.S. Treasury bill has short maturity and there is no risk of default, short-term government debt can be considered risk-free. Investors in common stocks have earned a risk premium of 7.0 percent (10.1 - 4.1 percent). Thus, on average investors in common stocks have historically been compensated with a 7.0 percent higher return per year for taking on the risk of common stocks.

**Table 4.1: Average nominal compounded returns, standard deviation and risk premium on U.S. securities, 1990-2000.**

 Annual return Std. Variation Risk premium

U.S Treasury Bills 4.1% 4.7% 0.0%

U.S Government bonds 4.8% 10.0% 0.7%

U.S Common stocks 10.1% 7.0% 7.0%

*Source: F. Dimson, P. R Mash and M Stauton, Triumph of the optimists: 101 Years of*

*Investment return University Press, 2002*

Across countries the historical risk premium varies signiﬁcantly. In Denmark the average risk premium was only 4.3 percent compared to 10.7 percent in Italy. Some of these differences across countries may reflect differences in business risk, while others reﬂect the underlying economic stability over the last century. The historic risk premium may overstate the risk premium demanded by investors for several reasons. First, the risk premium may reflect the possibility that the economic development could have turned out to be less fortunate. Second stock return have for several periods outpaced the underlying growth in earnings and dividends, something which cannot be expected to be sustained.

The risk of ﬁnancial assets can be measured by the spread in potential outcomes. The variance and standard deviation on the return are standard statistical measures of this spread.

**Variance**

This is the expected’ (average) value of squared deviations from mean. The variance measures the return volatility and the units are percentage squared.

$$Variance \left(r\right)=σ^{2}=\frac{1}{N-1}\sum\_{t=1}^{N}(r\_{t}-\overline{r})^{2} $$

Where $\overline{r}$ denotes the average return and N is the total number of observations.

**Standard deviation**

This is the square root of variance. The standard deviation measures the return volatility and units are in percentage.

$$Std. dev. \left(r\right)= \sqrt{variance \left(r\right)}=σ $$

Using the standard deviation on the yearly returns as measure of risk it becomes clear that U.S. Treasury bills were the least variable security, whereas common stock were the most variable (table 4.1). This insight highlights the risk-return tradeoff, which is key to the understanding of how ﬁnancial assets are priced.

**Risk-return trade off**

Investors will not take on additional risk unless they expect to be compensated with additional return. The risk-return tradeoff relates the expected return of an investment to its risk. Low levels of uncertainty (low risk) are associated with low expected returns, whereas high levels of uncertainty (high risk) are associated with high expected returns. It follows from the risk return tradeoff that rational investors will when choosing between two assets that offer the same expected return prefer the less risk one. Thus, an investor will take on increased risk only if compensated by higher expected returns. Conversely, an investor who wants higher return must accept more risk. The exact trade-off will differ by investor based on individual risk aversion characteristics (i.e. the individual preference for risk taking):

**The effect of diversification on risk**

The risk of an individual asset can be measured by the variance on the returns. The risk of individual assets can be reduced through diversiﬁcation. Diversiﬁcation reduces the variability when the prices of individual assets are not perfectly correlated. In other words, investors can reduce their exposure to individual assets by holding .1 diversiﬁed portfolio of assets. As a result, diversiﬁcation will allow for the same portfolio return with reduced risk. A classic example of the beneﬁt of diversiﬁcation is to consider the effect of combining the investment in an ice-cream producer with the investment in a manufacturer of umbrellas. For simplicity, assume that the return to the ice-cream producer is +15% if the weather is sunny and -10% if, it rains. Similarly the manufacturer of umbrellas beneﬁts when it rains (+15%) and loses when the sun shines (-10%). -Further, assume that each of the two weather, states occur with probability 50%.

**Expected return Variance**

Ice-cream producer 0.5 × 15% + 0.5×(-10%)=2.5% 0.5×[15-2.5]2+0.5×[-10-2.5]2=12.52%

Umbrella manufacturer 0.5 × (-10%) + 0.5×15%)=2.5% 0.5×[-10-2.5]2+0.5×[-15-2.5]2=12.52%

Both investments offer an expected return of +2.5% with a standard deviation of 12.5 percent. Compare this to the portfolio that invests 50% in each of the two stocks. In this case, the expected return is -l-2.5% both when the weather is sunny and rainy (0.5 × 15% + 0.5 × (-10%) = 2.5%). However, the standard deviation drops to 0% as there is no variation in the return across the two states. Thus, by diversifying the risk related to the weather could be hedged. This happens because the returns to the ice-cream producer and umbrella manufacturer are perfectly negatively corre1ated.Obviously the prior example is extreme as in the real world it is difﬁcult to find investments that are perfectly negatively correlated and thereby diversify away all risk. More generally the standard deviation of a portfolio is reduced as the number of securities in the portfolio is increased. The reduction in risk will occur if the stock returns within our portfolio are not perfectly positively correlated. The beneﬁt of diversiﬁcation can be illustrated graphically:

**Figure 4.1 How portfolio diversification reduces risk**

10

7.5

5

2.5

0

Unique risk

Variability in returns

(standard deviation %)

Total

risk

Market risk

 0 5 10 15

Number of stock in portfolio

**UNIT 5: PORTFOLIO RISK**

 Portfolio risk is the possibility that an investment portfolio may not achieve its objectives. There are a number of factors that contribute to portfolio risk, and while you are able to minimize them, you will never be able to fully eliminate them. Total portfolio risk = Unique risk + Market risk

**Unique risk**

These are risk factors affecting only a single assets or a small group of assets;

Unique risk is also called:

* ldiosyncratic risk.
* Unsystematic risk,
* Company unique risk.
* Diversiﬁable risk.
* Firm speciﬁc risk.

Examples c f unique risk is a strike among the workers of a company, an increase in ‘the interest rate a company pays on its short-term debt its bank, a product liability suit.

**Market risk**

This is an economy-wide source of risk that affects the overall stock market. Thus, market risk inﬂuences a large number of assets, each to a greater or lesser extent. Market is also called:

* Systematic risk;
* Non-diversiﬁable risk.

Examples of market risk are the changes in the general economy or major political events such as changes in general interest rates, changes in corporate taxation, etc. As diversiﬁcation allows investors to essentially eliminate the unique risk, a well-diversiﬁed investor will only require compensation for hearing the marker: risk of the individual security. Thus, the expected return on an asset depends only on the mar at risk.

**Measuring market risk**

Market risk can be measured by beta, which measures how sensitive the return is to market movements. Thus, beta measures the risk of an asset relative to the average asset. By deﬁnition the average asset has a beta of one relative to itself. Thus, stocks with betas below 1 have lower than average market risk; whereas a beta above 1 means higher market risk than the average asset.

**Estimating beta**

Beta is measuring the individual asset's exposure to market risk. Technically the beta on a stock is deﬁned as the covariance with the market portfolio divided by the variance of the market:

$$β\_{t}=\frac{covariance with market}{variance of market }=\frac{σ\_{im}}{σ\_{m}^{2}}$$

In practice the beta on a stock can be estimated by ﬁtting a line to a plot of the return to the stock against the market return. The standard approach is to plot monthly returns for the stock against the market over a 60-month period.

Stope= 1.14

R2=0.084

Return on

stock, %

Return on

Market, %

Intuitively, beta measures the average change to the stock price when the market rises with an extra percent. Thus, beta is the slope on the ﬁtted line, which takes the value 1.14 in the example above. A beta of 1.l4 means that the stock ampliﬁes the movements in the stock market, since the stock price will increase with 1.14% when the market rise an extra 1%. In addition it is worth noticing that r-square is equal to 8.4% of the variation in the stock price is related to market risk.

**Portfolio risk and return.**

The expected return on a portfolio of stocks is a weighted average of the expected returns on the individual stocks. Thus, the expected return on a portfolio consisting of n stocks is.

$$portfolio return=\sum\_{i=1}^{n}w\_{i}r\_{i}$$

Where $w\_{i}$ denotes the fraction of the portfolio invested in stock *i* and *ri*, is the expected rett m on stock

**Example:**

Suppose you invest 50% of your portfolio in Nokia and 50% in infinix. The expected return on your Nokia stock is 25% while infinix offers 15%. What is the expected return on your portfolio?

$$portfolio return=\sum\_{i=1}^{n}w\_{i}r\_{i}=0.5×25\%+0.5×15\%=20\%$$

A portfolio with 50% invested in Nokia and 50% in infinix has an expected return of 20%.

**Portfolio variance**

To understand how the portfolio variance is calculated consider the simple case where the portfolio only consist of two stocks, stock 1 and 2. In this case the calculation of variance can be illustrated by ﬁlling out four boxes in the table below.

**Table 5.1 calculation of portfolio variance**

|  |  |  |
| --- | --- | --- |
|  | Stock 1 | Stock 2 |
| Stock 1 | $$w\_{1}^{2}σ\_{1}^{2}$$ | $$w\_{1}w\_{2}σ\_{12}=w\_{1}w\_{2}ρ\_{12}σ\_{1}σ\_{2}$$ |
| Stock 2 | $$w\_{1}w\_{2}σ\_{12}=w\_{1}w\_{2}ρ\_{12}σ\_{1}σ\_{2}$$ | $$w\_{2}^{2}σ\_{2}^{2}$$ |

In the ‘top let comer of Table, you weight the variance on stock 1 by the fraction of the portfolio invested in stock]. Similarly, the bottom left comer-. is the variance of stock 2 times the square of the fraction of the portfolio invested in stock2.‘ The two entries in the diagonal boxes depend on the covariance between stock 1 and 2. The covariance is equal to the correlation coefficient times the product of the two standard deviations on stock 1 and 2. The portfolio variance is obtained by adding the content of the four boxes together:

$$portfolio varinace= w\_{1}^{2}σ\_{1}^{2}+w\_{2}^{2}σ\_{2}^{2}=2w\_{1}w\_{2}ρ\_{12}σ\_{1}σ\_{2} $$

The beneﬁt of diversiﬁcation follows directly from the formula of the portfolio’ variance, since the portfolio variance is increasing in the covariance between stock 1 and 2. Combining stocks with a low correlation coefficient will therefore reduce the variance on the portfolio.

**Example:**

Suppose you invest 50% of your portfolio in Nokia and 50% in inifinix. The standard deviation on Nokia's and infinix's return is 30% and 20%, respectively. The correlation coefficient between the two stocks is 0.4. What is the portfolio variance?

$$portfolio varinace= w\_{1}^{2}σ\_{1}^{2}+w\_{2}^{2}σ\_{2}^{2}=2w\_{1}w\_{2}ρ\_{12}σ\_{1}σ\_{2}$$

$$=0.5^{2}×30^{2}+20^{2}+2×0.5×0.5×0.4×30×20=445=21.0.1^{2}$$

A portfolio with 50% invested in Nokia and 50% in infinix has a variance of 445, which is equivalent to a standard deviation of 21.1%

For a portfolio of n stocks the portfolio variance is equal to:

$$portfolio variance=\sum\_{i=1}^{n}\sum\_{j=1}^{n}w\_{i}w\_{j}σ\_{ij}$$

Note that when *i=j*, $σ\_{ij}$ is the variance of stock $i,σ\_{1}^{2}$ . Similarly, when $ i\ne j$, $σ\_{ij} $is the covariance between stock $σ\_{ij}=ρ\_{ij}σ\_{i}σ\_{j}$ .

**Portfolio’s market risk**

The market risk of a portfolio of assets is a simple weighted average of the betas on the individual assets.

$$portfolio beta=\sum\_{i=1}^{n}w\_{i}β\_{i}$$

Where $w\_{i}$ denotes the fraction of the portfolio invested in stock i and B; is market risk of stock *i*.

Example:

Consider the portfolio consisting of three stocks A, B and C.

 Amount invested Expected return Beta

Stock A 1000 10% 0.8

Stock B 1500 12% 1.0

Stock C 2500 14% 1.2

What is the beta on this portfolio? As the portfolio beta is a weighted average of the betas on each stock, the portfolio weight on each stock should be calculated. The investment in stock A is $1000 out of the total investment of $5000, thus the portfolio weight on stock A is 20%, whereas 30% and 50% are invested in stock B and C, respectively. The expected return on the portfolio is

$$rp= \sum\_{j=1}^{n}w\_{i}r\_{i}=0.2×10\%+0.3×12\%+0.5×14\%=12.6\%$$

Similarly, the portfolio beta is:

$$β\_{ρ}=\sum\_{i=1}^{n}w\_{i}β\_{i}=0.2×0.8×0.3×1×0.5×1.2=1.06 $$

The portfolio investing 20% in stock A, 30% in stock B, and 50% in stock C has an expected return of 12.6% and a beta of 1.06. Note that a beta above 1 implies that the portfolio has greater market risk than the average asset.

**UNIT 6: PORTFOLIO THEORY**

Portfolio theory is the foundation for estimating the return required by investors for different assets. Through diversiﬁcation the exposure to risk could be minimized, which implies that portfolio risk is less than the average of the risk of the individual stocks. To illustrate this consider Figure 6.1, which shows how the expected realm and standard deviation change as the portfolio is comprised by different combinations of the Nokia and infinix stock.

**Figure 6.1 Portfolio diversification**

Expected Return (%)

100% in Nokia

50% in Nokia

100% in infinix

 Standard deviation

If the portfolio invested 100% in infinix the expected return would be 15% with a standard deviation of 20%. Similarly, if the portfolio invested 100% in Nokia the expected return [would be 25% with a standard deviation of 30%. However, a portfolio investing 50% in Nokia and 50% in infinix would have an expected return of 20% with a standard deviation of 21.1%. Note that the standard deviation of 21.1% is less than the average of the standard deviation of the stocks (0.5×20% + 0.5×30% = 25%). This is due to the beneﬁt of diversiﬁcation. In similar vein, every possible asset combination can be plotted in ‘risk-return space. The outcome of this plot s the collection of all such possible portfolios, which defines a region in the risk-return space. As the objective is to minimize the risk for a given.

expected return and maximize the expected return for a given risk, it is preferred to move up and to the left in Figure 6.2. Figure 6.2

**Portfolio theory and the efficient frontier**

expected Return (%)

 Standard deviation

The solid line along the upper edge of this region is known as the efficient frontier. Combinations along this line represent portfolio for which there is lowest risk for a given level of return. Conversely, for a given amount of risk, the portfolio lying on the efficient frontier represents the combination offering the best possible return. Thus, the efficient frontier is at collection of portfolios, each one optimal for a given amount of risk.

The Sharpe-ratio measures the amount of return above the risk-free rate a portfolio provides compared to the risk it carries.

 $shape ratio on portfolio i=\frac{r\_{i}-r\_{f}}{σ\_{i}}$

Where $r\_{i}$the return on portfolio is $i,r\_{f}$ is the risk free rate and fat is the standard deviation on portfolio *i’s*. Thus, the Shape-ratio measures the risk premium on the portfolio per unit of risk.

In a well-functioning capital market investors can borrow and lend at the same rate. Consider an investor who borrows and invests fraction of the funds in a. portfolio of stocks and the rest in short-term government bonds. In this case the

investor can obtain an expected return from such an allocation along the line from the risk free rate $r\_{f}$ through the tangent portfolio, where the investor is borrowing additional’ funds to invest in the tangent portfolio. This line is known as the capital allocation fine and plots the expected return against risk (standard deviation).

**Figure 6.3 Portfolio theory**

Expected Return (%)

Market

Portfolio

Risk free rate

Standard deviation

The tangent portfolio is called the market portfolio. The market portfolio is the portfolio on the efficient frontier with the highest Sharpe-ratio. Investors can therefore obtain the best possible risk return trade-off-by holding a mixture of market portfolio and borrowing or lending. Thus, by combining a risk-free assets with risk) assets, it is possible to construct portfolios risk-return proﬁles are superior to those on the efficient frontier.

**UNIT 7: CAPITAL ASSETS PRICING MODEL (CA PM)**

The Capital Assets Pricing Model (CAPM) derives the expected return on an assets in a market, given the risk-free available to investors and the compensation for market risk. CAPM specifies that the expected return on an asset is a liner function of its beta and market risk premium:

$$expected return on stock i=r\_{i}=r\_{f}+β\_{i}(r\_{m}-r\_{f})$$

Where $r\_{f}$ is the risk-free rate, $β\_{i}$ is stock ί’s sensitivity to movements in the overall stock market, where as $(r\_{m}-r\_{f})$ is the market risk premium per unit of risk. Thus, the expected return is equal to the risk free-rate plus compensation for the exposure to market risk. As $β\_{i}$ is measuring stock ί’s exposure to market risk in units of risk, and the market risk premium is the compensations to investors per unit of risk, the compensation for market risk of, stock ί is equal to the $β\_{i}(r\_{m}-r\_{f})$ Figure 7.1 illustrates CAPM:

**Figure 7.1 Portfolio expected return**

Expected return (%)

Security market line

Market portfolio

Risk free rate

Beta (β)

1.0

The relationship between β and required return is plotted on the *securities market* *line*, which shows expected return as a function of β, Thus, the security market line essentially graphs the results from the CAPM theory. The x-axis represents the .risk (beta), and the y-axis represents the expected return. The intercept is the risk— free rate available for the market, while the slope is the market risk premium $(r\_{m}-r\_{f})$ CAPM as a simple but powerful model. Moreover it takes into account the basic principles of portfolio selection:

1. Efﬁcient portfolios (Maximize expected return subject to risk);
2. Highest ratio of risk premium to standard deviation is a combination of the market portfolio and the risk-free asset;
3. Individual stocks should be selected based on their contribution to portfolio risk;
4. Beta measure the marginal contribution of a stock to the risk of the market portfolio.

CAPM theory states that all assets should be priced such that they fit along the: security market line one way or the other. If a stock is priced such that it offers a higher return than what is predicted by CAPM, investors will rush to buy the stock. The increased demand will be reﬂected in a higher stock price and subsequently in lower return. This will occur until the stock ﬁts on the security market line. Similarly, if a stock is priced such that it offers a lower return than the return implied by CAPM, investor would hesitate to buy the stock. This will provide a negative impact on the stock price and increase the return until it equals the expected value from CAPM.

**Example**

Calculate investor’s expected return on IBM stare if the risk free rate is 8% (US Treasury bill rate), beta is 0.8, and return on a market portfolio is 9%.

$$expected return on stock IBM=r\_{i}=r\_{f}+β\_{i}\left(r\_{m}-r\_{f}\right)$$

$$r=0.08+0.8 \left(0.09-0.08\right)=7.2\%$$

 **Alternative asset pricing models**

Arbitrage pricing theory (APT) assumes that the return on a stock depends partly on macroeconomic factors and partly on noise, which are company speciﬁc events. Thus, under APT the expected stock return depends on an unspecified number of macroeconomic factors plus noise:

$$Expected return=a+b\_{1}×r\_{factor}+b\_{2}×r\_{factor 2}+…+b\_{n}×r\_{factors}+noise$$

Where,$ b\_{1},b\_{2…..,}b\_{n}$ is the sensitivity to each of the factors. As such the theory does not specify what the factors are expect for the notion of pervasive macroeconomic conditions. Examples of factors that might be included are return on the market portfolio, an interest rate factor, GDP, exchange rates, oil prices, etc.

Similarly, the expected risk premium on each stock depends on the sensitivity to each factor$b\_{1},b\_{2…..,}b\_{n}$ and the ‘expected risk premium associated with the factors:

$$Expected risk premium=b\_{1}×\left(r\_{factor 1}-r\_{f}\right)+b\_{2}×\left(r\_{factor 2}-r\_{f}\right)+…+b\_{n}×(r\_{factor n}-r\_{f}$$

In the special case where the expected risk premium is proportional only to the portfolio’s market beta, APT and CAPM are essentially identical. APT theory has two- central statements:

1. A diversiﬁed portfolio designed to eliminate the macroeconomic risk (i.e. have zero sensitivity to each factor) is essentially risk‘-‘free and will therefore be priced such that it offers the risk free rate as interest.
2. A diversiﬁed portfolio designed to be exposed to e.g. factor 1, will offer a risk premium that varies in proportion to the portfolio’s sensitivity to factor

**Consumption beta**

If investors are concerned about an investment’s impact on future consumption rather than wealth, a security’s risk is related to its sensitivity to changes in the investor’s consumption rather than wealth in this case the expected return is a function of stock’s consumption beta rather than its market beta. Thus, under the consumption CAPM the most important risks to investors are those they might cutback future consumption.

**Three-Factor Model**

The three factor model is a variation of the arbitrage pricing theory that explicitly states that the risk premium on securities depends on three common risk factors: a market factor, a size factor, and a book-to-market factor:

$$Expected risk premium=b\_{market}×\left(r\_{market factor}\right)+b\_{size}×\left(r\_{size factor}\right)+b\_{book-to-market}×(r\_{book-to-market})$$

Where, the three factors are measured in the following way:

* Market factor is the return on market portfolio minus the risk-free rate;
* Size factor is the return on small-ﬁrm stocks minus the return on large» firm stocks (small minus big);
* Book-to-market factor is measured by the return on high book-to-market value stocks minus the return on low book-value stocks (high minus low).

As the three factor model was suggested by lama and’ French, the model is commonly mown as the Fama-French three-factor model.

**UNIT 8: RISK MANAGEMENT TECHNIQUES AND TOOLS**

In previous units, we looked at techniques and tools available to risk managers for reducing risks. In this unit, we concentrate on techniques that are used by risk managers that are “born” on ﬁnancial markets. To these techniques we relate: Forward contracts, futures contracts, swaps and options.

There are actually three ways that institutions, corporations and individuals trade: the spot market, the forwards market and the futures market. The spot market always has been the largest market because it is the "underlying" real asset that the forwards and futures markets are based on. In the past, the futures market was the most popular venue for traders because it was available to individual investors for a longer period of time. However, with the advent of electronic trading, the spot market has witnessed a huge surge in activity and now surpasses the futures market as the preferred trading market for individual investors and speculators.

**Spot Market**

This is the market for immediate delivery. The price used in the spot market is referred to as the spot rate. More speciﬁcally, the spot market is where currencies, and commodities are bought and sold according to the current price. That price. determined by supply and demand, is a reﬂection of many things including current interest rates, economic performance, sentiment towards on-going political situations (both locally and internationally), as well as the perception on the future performance of one currency against another. When a deal is ﬁnalized, this is known as a "spot deal". It is a bilateral transaction by which one part} delivers an agreed-upon amount of the underlying asset to the counter-party and receives a specified amount of money at the agreed-upon price. After a position F closed, the settlement is in cash. Although the spot market is commonly known one that deals with transactions in the present (rather than the future), these trade actually take two days for settlement.

**Forward Market**

This is the market for the buying and selling of good with the exchange of the underlying assets and money at a future date. Although forward contracts usually call for the exchange to occur in either 30, 90 or 180 days, the contract can be customized to call for the exchange of any desired quantities of the underlying assets at any future date acceptable to both parties to the contract. The price of ‘future delivery is typically referred to as a forward rate.

**Futures Market**

Although the futures market trading is similar to forward market trading in that all transactions are to be settled at a future date, futures markets are actual physical locations where anonymous participants trade standard quantities of a commodity or foreign currency (e.g., 125,000 DM per contract) for delivery at standard future dates (e.g., March, June, September, and December).

We now 10 3k’ at each of the tools in detail and for simplicity sake and relevance to our specialty we will use foreign currency as they underlying asset:

1. **Forward contracts**

Unlike the spot market, the forward markets do not trade actual currencies. Instead they deal in contracts that represent claims to a certain currency type, a speciﬁc, price per unit and a future date for settlement. In the forwards market contracts are bought and sold OTC between two parties, who determine the terms of the agreement between themselves.Forward contracts are binding and are typically settled for cash for the exchange in question upon expiry, although contracts can also be bought and sold before they expire. The forwards can offer protective against risk when trading currencies. Usually, big international corporations these markets in order to hedge against future exchange rate ﬂuctuations, speculator take part in these markets as well.

Forward exchange operations carry the same credit risk as spot transactions, but for longer periods of time, however there are signiﬁcant exchange risks involved.

A forward contract between a bank and customer (which could be another bank) calls for-delivery at .a fixed ﬁxture date, of a speciﬁed amount on one currency I against dollar payment, the exchange rate is fixed at the time the contract is entered into. Hence, a forward market is the market in which currencies are bought and sold now hut delivery is done sometimes in the future.

Forward exchange contracts allow a trader who knows that he/she will have to buy or sell foreign currency at a date in ﬁxture to make the purchase or sale at a pre~ determined rate of exchange. The forward currency exchange rate is dependent on:

* Spot rate
* Short term fixed interest rates in each currency.

Forward rate can be calculated today without making any estimates of future exchange. Future exchange rates depend on future events and will often turn out to be very different from the forward rate.

In a typical forward transaction, for example, a U.S company buys textiles from England with payment of £1 million due in 90 days. ’The importer, thus, is short pounds-that is it owes pounds for ﬁxture delivery. Suppose the present price of the pound is $1.71 over the next 90 days, however the pound might rise against the dollar, raising the dollar cost of the textiles. The importer can guard against this exchange risk by immediately negotiating a 90-day forward contract with a bank at a price of say £=$1\_.72. According to the forward contract, in 90 days the bank will give the importer £1 million (which it will use to pay for its textiles order) and the importer will give the bank $1.72 million, which is the dollar equivalent of £1 million at the forward rate of $1.72.

**How are Forward rates derived?**

Forward rates are derived by applying current market interest rates to the spot exchange rate. A simple example might illustrate this point. Suppose that the spot GBP/US dollar rate is 1 G131’ = E13 1.50, and that the one-year interest rate is 6% for sterling at 4% for the US dollar, According to 1'1’ market prices, this means:

* 1,000 GBP has an equivalent spot value of $1,500
* An inventor with sterling 1,000 who wants to exchange the sterling into dollars in one year has two ways of doing this. He can buy $1,500 now (spot) and invest the dollars for one year at 4% to earn $1,560 at the end of one year. Alternatively, he can invest l, 000 GBP’ for one year at 6% to earn 1,060 sterling and then exchange the sterling for US dollars. For market rates to stabilize, this means that given the‘ current spot, exchange rate and current one year interest rates, 1,060 sterling in one; year has an equivalent value of$l.,560, and so appropriate one-year forward rate now would be 1 GBP $1.471? (1,560/1,060). The dollar would be strong; against sterling one year forward (at 1.4717), compared to the spot rate (1.5000. This is because the interest rate is lower on the dollar than on sterling.

**Forward premium and forward discount**

A foreign, currency is at a forward discount if the forward rate expressed in dollar (home currency) is below the spot rate; where as forward premium exists if forward late is above the spot rate. Hence, forward premium is the situation win" the forward rate is greater than the spot rate and forward discount is the situated when the forward rate is less than the spot rate. A premium or discount is simply the amount by which the forward rate differs from the spot rate and the size of the premium or discount depends on the difference in interest rates between the two currencies. Whether the forward rate is weaker or stronger than the spot rate depends on which currency has the higher and which has the lower interest rate. The currency with the lower interest rate is always stronger forward than spot against the currency with the higher interest rate.

**UNIT 9: F‘UTURES MARKET**

 The futures market is the second tool available to risk managers that we are going to look at.

**What is a futures contract?**

Futures contract is a type of derivative instrument, or ﬁnancial contract, in which two parties agree to transact it set of ﬁnancial instruments or physical commodities for future delivery at a particular price. If you buy a futures contract, you are basically agreeing to buy something that a seller has not yet produced for a set price. But participating in the futures market does not necessarily mean that you will be responsible for receiving or delivering large inventories of physical commodities -- remember, buyers and sellers in the futures market primarily enter into futures contracts to hedge risk or speculate rather than to exchange physical goods (which is the primary activity of the cash /spot market. That is why not only producers and consumers but also speculators use future; as ﬁnancial instruments. The consensus in the investment world is that the futures market is a major ﬁnancial hub, providing an outlet for intense competition among buyers and sellers and, more importantly/, providing a centre to manage price risks. The futures market is extremely liquid, risky and complex by nature, but it can, be understood if we break down how it functions. While futures are not for the risk averse, they are useful for a wide range of people.

**History of futures**

Before the North American, futures market originated some 150 years ago, farmers would grow their crops and then -bring them to market in the hope of selling their inventory. But without any indication of demand, supply often exceeded what was needed and un-purchased crops were left to rot in the streets. Conversely, when - given commodity wheat, for instance - was out of season, the goods made from became very expensive because the crop was no longer available.

In the mid-nineteenth century, central grain markets were established and a central market places was created for farmers to bring their commodities and sell them either for immediate delivery (spot trading) or for forward delivery. The latter contracts forward contracts were the forerunners to today's futures contracts. In fact, this concept saved many, a farmer the loss of crops and profits and helped stabilize supply and pi ices in the off-season.

Today's futures market is a global marketplace for not only agricultural goods, but also for currencies and ﬁnancial instruments such as: Treasury bonds and securities (securities futures). It's a diverse meeting place of farmers, exporters, importers, manufacturers and speculators. Thanks to modem technology, commodities prices are seen throughout the world, so an American farmer can match a bid from a buyer in Europe.

Currency futures contracts are currently available for the British pound, Canadian dollar, Swiss franc, Japanese yen, Australian dollar and European currency unit. Contract sizes are standardized according to amount of foreign currency, for example, £62,500, C$ 100,000, SFr 125,000,A$ 100,000, DM 125,000, FF 250, 000, ¥ 12,500,000.

**How futures work**

The futures market is a centralized marketplace for buyers and sellers from around the world who meet and enter into futures contracts. Pricing can be based on an open cry system, or bids and offers can be matched electronically. The future contract will state the price that will be paid and the date of delivery. But don't: worry, as we mentioned earlier, almost all future contracts end without the actual physical delivery of the commodity.

There are mainly two types of futures contracts, namely currency futures and interest rate futures.

In every futures contract, everything is speciﬁed: the quantity and quality of the commodity, the specific price per unit, and the date and method of delivery. The “price” of a futures contract is represented by the agreed-upon price of the underlying commodity or financial instrument that will be delivered in the future. On the futures market, an investor goes long when he enters a contract by agreeing to buy and receive delivery of the underlying asset at a set price « it means that he or she is trying to proﬁt from an anticipated future price increase. A speculator who goes short enters into a futures contract by agreeing to sell and deliver the underlying at a set price - is looking to make a proﬁt from declining price levels. By selling high now, the contract can be repurchased in the future at a lower price, thus generating a profit for the speculator.

The profits and losses of 1 futures contract depend on the daily movements of the market for that contract and are calculated on a daily basis. For example, say the futures contracts for ‘wheat increases to Kl5, 000 per sack the day after the above farmer and bread maker enter into their Futures contract of K10, 000 per sack. The farmer, as the holder of the short position, has lost K5, 000 per sack because the selling price just increased from the future price at which he is obliged to sell his wheat. The bread maker, as the long position, has proﬁted by K5,000 per sack because the price he is obliged to pay is less than what the rest of the market is obliged to pay in the future for wheat. On the day the change occurs, the farmer's: account is debited K25, 000, 000 (K5, 000 per sack X 5,000 sacks) and the bread maker's account is credited by [(25,000 (K5, 000 per sack X 5,000 sacks). As the market moves every day, these kinds of adjustments are made accordingly. Unlike the stock market, futures positions are settled on a daily basis, which means the gains and losses from a day's trading are deducted or credited to a person's account each day. In the stock market, the capital gains or losses from movements in prior aren’t realized until the investor decides to sell the stock or cover his or her short position. As the accounts of the parties in futures contracts are adjusted every day, most transactions in the Futures markets are settled in cash, and the actual physical commodity is bought or sold in the cash market. Prices in the cash and futures market tend to move parallel to one another, and when a futures contract expires, the prices merge into one price. So on the date either party decides to close out their futures position, the contract will be settled. I 1' the contract was settled at K15,000 per sack, the farmer would lose K5, 000 on the futures contract and the bread maker would have made K5, 0()0 on the contract. But after the settlement of the futures contract, the bread maker still needs wheat to make bread, so he will in actuality buy his wheat in the cash market (or from 2: wheat pool) for K15,000 per sack (a total of K75,000,000) because tha.t':: the price of wheat in the cash market when he closes out his contract. However, technically, the bread maker's futures profits of K5, 000 go towards his purchase, which means he still pays his locked-in pi ice of Kl0,000 per sack(K75,000,000) - K25,000,000 = l(50,000,000). The farmer, after also closing out the contract, can sell his wheat on the cash market at Kl5,000 per sack but because of his losses from the futures contract with the bread maker, the farmer still actually receives only Kl0,000 per sack. In other words, the farmer's loss in the futures contract is offset by the higher selling price in the cash market - this is referred to as hedging.

**Risk reduction**

Futures markets can be used to reduce risk when making purchases. Risks are reduced because the price is price-set, therefore letting participants know how much they will need to buy or sell. This helps reduce the ultimate cost to the retail buyer because with less risk there is less of a chance that manufacturers will jack up prices to make up for proﬁt losses in the cash market.

**UNIT 10: OPTIONS MARKET**

Whatever advantages the 'forward or ﬁxtures contract might hold for their purchaser, they have a common disadvantage, While they protect the holder against the risk of adverse movements in change rates, they eliminate the possibility of gaining a windfall profit from favourable movements. This was apparently one of the considerations that led some commercial banks to offer currency options to their customers exchange added currency options were first offered in1983 by the Philadelphia Stock Exchange (PHLX).

**What is an option?**

In principal, an option is a ﬁnancial instrument that gives the holder the right-but not the obligation to sell (put) or buy (call) another ﬁnancial instrument at a set price and expiration date. The seller of the put option or call option must fulfil the contract if the buyer so desires it. Because the option not to buy or sell has value the buyer must ‘pay the seller of the option some premium for this privilege. A: applied to foreign currencies, call options give the customer the right to purchase and put options give the right to sell, the contracted currencies at the expiration date. An American option can be exercised at any time up to the expiration date; a European option can only be exercised at maturity.

An option that would be profitable to exercise at the current exchange rate is said to be in-the money. Conversely, an out of-the money option is one that would not be proﬁtable to exercise at the current exchange rate. The price at which the option is exercised is called exercise price or strike price. An option whose exercise prim- is the same as the spot exchange rate is termed as at-the-money. If the exercise price for an option is more favourable for the option holder than the current market price of the underlying item, the option is said to be in-the-money. If the exercise price for option less favourable for the option holder than the current market price of the underlying item, the option is said to be out-of-the-money. If the exercise price for an option is exactly the same the current market price of the underlying item, the option is said to be at»-the--money. The option holder is not obliged to exercise the option, and will never do so if the option is out 011 the- money. To see how currency options might be useful, consider a US importer that has a DM62, 500 payments to make a German exporter in 60 days. The importer could purchase a European call option to have the DM delivered to it at a speciﬁed exchange rate (the strike price) on the due date. Suppose the option premium is $0.02 per DM, and the exercise price is $0.64. The importer has paid $1,250 for the right to buy DM62, 500 at a price of $0.64 per DM at the end of 60 days. If at the time importer’s payment fall due, The value of the DM has risen to say, $0.70, the option would be in—the-money. In this case, the importer exercises its call option, and purchases DM for $0.64. The importer would cam profit of $3,750 (62,500 x 0.06), which would more than cover the $1,250 cost of the option. If the rate has declined below the contracted rate, say, $0.60, the option would be out-of- the-money. Consequently, the importer would let the option expire and purchase the DM in the spot market. Despite losing the $1,250 option premium, the importer would still be $1,250 better off than if it had looked in a rate of $0.64 with a forward or futures contract. In contrast, a put option at the same terms (exercise of $0.64 and put premium of $60.02 per DM) would be in-the-money at a spot price of $0.60 and out-of-the money at $0.70. If the spot price falls to, say, $0.58, the holder of put option will deliver DM62, 500 worth $36,250 (0.58 x62, 500) and receive $40,000 (0.64 x 62,500). The option holder’s proﬁt, net of the $l, 250 option premium, is $2,500. As the spot price falls further, the value of the put option rises. At the extreme, if the spot rate falls to 0, the buyer’s proﬁt on the contract will reach $38,750 (0.64x 62,500)-1,250). Below 21 spot rate of $0.62, the gain on the put option will be more.

The terms “European" and “American” have nothing to do with where the different types of option are available. Both European and American option can be obtained anywhere in the world.

**Option pricing and valuation**

The value of an option is comprised of two components; intrinsic va1ue and time value. The intrinsic value of the option is the amount by which the option is in the- money, or S-E, where S is the current spot price and E the exercise price. In other words, the intrinsic value equals the immediate exercise value of the option. Thus, the further in-the-money and option is, the more valuable it is. An out-of-the-money option has no intrinsic value. For example, the intrinsic value of a call option on the Swiss francs with an exercise price of $0.74 and spot rate of $0.77 would be $0.03 per franc. The intrinsic value of the option for spot rates less than the exercise price is zero. Any excess of the option value over its intrinsic value is called the time value of the contract. An option will generally sell for at least its intrinsic value.

The more out-of-the-money an option is, the lower the option price. Intrinsic value is the difference between the strike price for the option and the current market price of the underlying item. Only an in-the-money option ha: intrinsic value, however. Intrinsic value cannot be negative, so an out-of-the-money option has intrinsic value’ of 0.

Time value is the value placed on the option. This reflects the likelihood that the market price of the underlying item will move so that the option will become in- the-money or even further in the-money (deep-in-the money)

**Put-Call parity**

The Black-Scholes model is used to price call options. The price of a put option can be derived from the price of a call using the put-call parity formula:

Value of a put option + Current value of underlying security = Value of call

Present value of exercise price.

This relationship expresses what is known as put-call parity. i.e. that put and call options must have the same time value when they are identical with respect to exercise price, expiry date and underlying security, otherwise arbitrage proﬁts can be made.

**Example**

 The price of a six-moth European call option on shares in Zambia breweries is 53 pounds. The strike price for the options is 260 pounds and the current market price of the shame is 290 pounds. What should be the price of a six-month European put option for ‘he same expiry date and the same strike price, if you are given that the present value of the exercise price is 252 pounds?

**Solution**

Value of Put option + 290 '= 53 +252

Value of Put option = 15

The value of the put is lower than the value of the call in this example because the call is in-the money whereas the put is out-of-the-money.

**Options market structure**

Options might be bought and sold on an options exchange. Exchange traded options in include options on equity shares and options on futures contracts. Some currency options are also exchange traded, for example on the Philadelphia stock exchange. Interest rate options and most currency options are over the counter (OTC) options. A feature of exchange traded options is that, like future contract: they are standardized instruments. Each option of a given type is for a standard quantity of the underlying item. Because they are standardized, they are easy to buy and sell. CTC options, in contrast, are tailored to the specific requirements of the option buyer. The drawback to a tailor -made OTC option is that it cannot easily be re-sold by the option holder. If the option is no longer required, the option holds.

# **UNIT 11: SWAPS**

In this unit, we cover alternative strategies for hedging currency or interest rate risk, in addition to forward contracts, futures, and options, especially strategies for long term risk.

**What are swaps?**

A swap is a contractual agreement between two parties to exchange cash ﬂows at predetermined periodic intervals. In a swap, two encounter parties agree to a contractual arrangement wherein they agree to exchange ‘cash ﬂows at periodic, intervals. There are two types of interest rate swaps:

1. **Single -currency interest rate swap**

“Plain vanilla” ﬁxed-for-ﬂoating swaps are often just called *interest rate swaps*. In this arrangement one counter patty exchanges the interest payments of a floating - rate debt obligation for the fixed rate interest payments of the other counterparty. The same currency is used. The main reasons tor using interest rate swaps are to better match cash inﬂows and outﬂows and to obtain savings.

1. **Cross-Currency interest rate swap**

This is often called a currency swap; ﬁxed for fixed rate debt service in two (or more) cu1rencics.One counterparty exchanges the debt service obligations of a bond denominated in one currency for the debt service obligations of the other counterparty denominated in another currency. Some reasons for using these swap are to obtain debt ﬁnancing in the swapped denomination at a cost saving anti hedge long-term foreign exchange risk

The most popular currencies used in swaps are the Euro, the American dollar, the Japanese Yen, Swiss francs and Great British Pounds.

**The Swap Bank**

A swap bank is a generic term to describe a ﬁnancial institution that facilitate: swaps between counterparties. The swap bank can serve as either a broker or dealer.might have to negotiate with the option writer about terms for an early cancellation of their agreement.

**Options premium**

An option is purchased by the buyer from the option seller or writer. The purchase price is called the option premium. With an OTC option, the option premium is the price paid to the option writer, and is negotiated between the buyer and the writer. With an exchange traded option, the premium is the market price of the option at the time it is purchased. The premium that an option holder has paid can be compared continually with current market price for the option. Exchange-traded options are therefore similar to future.

**Hedging risk**

Options offer a wide range of methods for limiting the risks associated with an exposure. Option holders can obtain ‘Insurance’ against adverse movements in exchange rates commodity prices while maintaining the ability to proﬁt should the prices move favourably.

With FRNS there is interest rate risk for the INC if interest rates changes, therefore, the MNC prefers fixed-rate debt to guarantee a fixed, stable interest expense. Swap Bank can broker an interest rate swap deal (for a fee) with Bank A and Company B that will benefit both (Bank A Company B, and the swap bank). Here is how:-

 "Risky " BBB "Safe" AAA

 Company B Bank A Difference Risk Premium for Co.B

Fixed-Rate 11.25% 10% (11.25 – 10%) +1.25% Fixed-rate

Floating-Rate LIBOR+0.5% LIBOR (LIBOR + 0.5% - LIBOR (0.50% Variable-rate)

 **QSD 0.75%**

The key to an interest-rate swap is the QSD (Quality Spread Differential), the difference or spread between fixed -interest rates (Risky - Safe), and variable interest rates (Risky - Safe). Company B would have to pay 1.25% more than Bank A for fixed rate debt, but only .50% more for variable rate. The QSD is 0.75%, reflecting the difference or additional default risk premium on ﬁxed rate debt for. MNC. The yield curve for ﬁxed-rate risky debt is much steeper than for safe debt, since with ﬁxed-rate debt lenders will: 1) Not have opportunities to adjust (raise) the rate on the fixed, and 2) Not have the opportunity to cancel the debt if the company gets in trouble ,and 3) Not be able to change the terms of the loan, All of these would be possible under ﬂoating-rate agreements, and lenders therefore have to "lock-in’ a high default risk premium for ﬁxed-rate debt at the beginning of the loan.

When a QSD exists, it represents the potential gains from trade if both parties together, through the swap bank. Here is one example of how the 0.75% QSD can be split up: Bank A will save 0.375% per year in interest savings (or $37,500;: year for 5 /ears for $l Om) and the MNC will save 0.25% in the form of interest rate savings (0 $25,000 per year for 5 years), and the swap bank cams 0.125% per year proﬁt on $ 10m to arrange the deal (or 59 12,500 per year for5 years).

As a broker, the swap bank matches counterparties but does not assume any of the risks of the swap. ’Commission is earned. As’ a dealer, the swap bank stands ready to accept either side of a currency swap, and they later lay off their risk, or match it with a counterparty. Swap banks will tailor the terms of interest rate and currency swaps to customers’ needs. They also make a market in “plain vanilla” swaps and provide quotes for these. Since the swap banks are dealers for these swaps, there is a bid-ask spread. For example, 6.60 - 6.85 means the swap bank will pay ﬁxed-rate payments at 6.60% against receiving dol1ar‘LIBOR or it will receive fixed-rate payments at 6.85% against receiving dollar LIBOR.

**Example of an interest rate swap**

Bank A is AAA-rated bank in U.K., and needs it $l0m cash inﬂow to ﬁnance 5- year, floating-rate (based on LIBOR), Eurodollar term loans I0 its commercial clients. To minimize (eliminate) interest rate risk, rank would prefer to match floating-rate debt (CD3 or notes) with its expected floating-rate assets (Eurodollar loans). Bank has two sources of debt/deposits available:

1. 5-Year FIXED-RATE BONDS @ 10% or
2. 5-Year FLOATING.-RATE NOTES (FRNs) @ LBOR

With ﬂoating rate loans and ﬁxed rate debt, there is interest rate risk. Therefore, bank prefers ﬂoating-rate debt, to match the floating rate loan (asset). For example, if the bank pays LIBOR for its deposits and charges LIBOR + 2% on its loans, it will always have a 2% spread (profit margin), whether LIBOR increases or decreases. Company B is a BBB rated Multinational Corporatio-1 (MNC) in U.S and needs $l0m debt for 5 years to inﬂuence a capital expenditure (new project, investment in property/plant, replace worn out equipment, etc.). The MNC has two: sources of debt available;

1. 5-Year FIXED-RATE BONDS @ 11.25% (higher risk than AAA bank)
2. 5-Year FLOATING-RATE NOTES (FRNS) @ LIBOR + .50.

Or there is $75,000 in annual savings ($10m\_x 0.75%) to split 3 ways: $37,500, $25,000 and $l2, 500 every year, or $375,000 in total savings over 5 years ($187,500 $125,000 and$62,500).

Without the swap, Bank A will pay variable-rate at LIBOR, and Co. B will pay ﬁxed-rate at 11.25%. With the swap, Bank A will pay all-in-cost (interest expense, transactions cost, service charges) interest expense of LIBOR - 0.375% (saving 0.375%) and Co. B will pay all-in-cost interest expense of 11% (saving 025%).

Here is how:

Instead of actually issuing the type of debt they really want, each party issues the opposite of what they want, and then they swap CFs. Instead of variable debt at LIBOR, Bank A issues fixed-rate Eurodollar bonds at 10%. Instead of issuing ﬁxed rate at 11.25%, Company B issues variable-rate debt at LIBOR + .50%. The patties issue the debt that they don't want, and make interest payments directly to the bondholders for 5 years. The swap batik then arranges the following CF payments:

1. Co. B pays 10.50% ﬁxed-rate interest (on $'l0m) to the Swap Bank, and the bank passes on1o‘.375% interest payment to Bank A in U.K. (Swap bank makes the difference = 10.50% -1o.37s% = .125%).

2. Bank A pays LIBOR on $10m to the Swap Bank and they pass on LIBOR Company B. As a result, here is the net position of each party:

**Bank A**

Pays-10%! ﬁxed-rate interest to bondholders

Pays variable-rate -LIBOR interest to Swap Bank

Receives +l0.375% ﬁxed interest rate from swap Bank

NET INTEREST = PAY LIBOR - 0.375% variable rate (w/swap), vs. LIBOR (w/swap)

**Company B.**

Pays variable-rate - (LIBOR + 0.5%) to bondholders

Pays -10.50% ﬁxed-rate to Swap Bank

Receives + (LIBOR) from Swap Bank

NET INTEREST= PAY 11.00% Fixed Rate (w/swap), vs. 11.25% (w/o swap)

**Swap Bank**

Receives 10.50% ﬁxed-rate from Co. B

Pays 1o.37s% to Bank A age: of+0.125% on fixed-rate debt)

Receives LIBOR from A

Pays LIBOR to Co. B

NET INCOME = 0.125%

Net result: Bank A borrows 310m at LIBOR - 0.375% instead of LIBOR, gets a variable-rate, and saves 0.375% per year interest rate, or $37,500 per year in interest expense (3 187,500 over 5years).

Company B borrows $10xn.at 11% instead of 1 \_1.25%, gets a ﬁxed rate, and saves 0.25% per year in interest fete, .or $25,000 per year in interest expense ($125,000 over 5 years).

Swap Bank makes 0.125%rper year on $10111 to arrange the deal, or $12,500 per year ($62,500) total.

**Example of Currency Swap,**

An American MNC like General motors has a subsidiary in Germany, and there is an investment opportunity expansion in Germany that will 640m and will have an economic life of 5 years. Current spot rate is $1.3 0/€, so the ﬁrm could consider raising $52min U33: by issuing bonds at 8% (payable in dollars), and converting $52m to €40 ﬁnance the expenditure. Hopefully cash ﬂows (in Euros) would be generated from the project to the interest payments in US dollars. The main problem with this transaction is that the MNC is likely to face foreign exchange risk because German earnings are in Euros, interest payments due in the USA are in USD.

Alternative ‘Loan: Raise €40m in the Eurobond market by issuing 5-year Euro bonds or payable in Euros. Eurobond rate is 6% for a well-known German or European firm, but the U.S. subsidiary in Germany must pay 7% because it might be relatively unknown or new, so there is a +1% risk premium.

Assume there is a German MNC with a mirror-image ﬁnancing need. It has a U.S. subsidiary needing $52111 for an expansion project in U.S. with a 5-year life. German MNC could borrow€40m in Germany at 6%, and convert to dollars, but there is also transaction exposure since cash flows would be generated in U.S. to make Euro interest payments in Germany.’ Company could issue Eurodollar bonds in U.S., but would face a9% (normal rate is 8%)'interest race because the German subsidiary «s not well-known in U.S and would pay a +1 % risk premium.

A Swap Bank could arrange a Currency Swap’ to: 1) Eliminate the long-term currency risk for both MNCs (transaction -exposure), and 2) Reduce interest expense for both companies. Each company has a "comparative advantage" at raising money in its home country, so each MNC would issue debt domestically 21' ,a savings of 1% compared to the foreign MNC raising funds(U.S. company raise- $52m in U.S. at 8%, vs. 9% for the German MNC; German company raises €40“. in Germany at 6%, vs. 7% for the U.S.—MNC).

The principal sums would be exchanged through a Swap Bank - U.S. company issues $5251 debt in U.S. at 8% and transfers $52m to the German subsidiary in U.S. and the German company issues €40m of debt Germany at 6% and transfers €40m to the U.S. subsidiary in Germany. Every year the U.S. subsidiary in Germany would submit €2.4m (€40m at 6% - instead of borrowing at 7%) to in» parent company in U.S., which would transfer the money to the Swap bank, which transfers funds to the German MNC to pay the Euro loan. The Germany

subsidiary in U.S would submit $4.16m ($52m at 2% - instead‘:/4f 9% on its own) to the Germany MNC, which would I1-ansfcr the money to the Swap Bank, and the bank would transfer funds to the U.S. MNC to pay for the dollar loan. At maturity, principal payments would take place the same way. Each company saves 1% per year on $52milli0n (640m), or $520,000 annually (€400,000), or $2.6m (€2m) over 5 years.

# **UNIT 12: RISK MANAGEMENT FOR INTERNATIONALY ACTIVE BANKS**

When banking systems in a number of industrial countries weakened in the late 1980s, pressure developed for harmonizing bank regulation among industrial countries, at least for large internationally active banks in these countries. Prior to 1988, bank ‘regulators tended to regulate bank capital by setting minimum levels for the ratio of capital to total assets. However, deﬁnitions of capital and the ratios considered acceptable varied from country to country. Some countries enforced their regulations more diligently than other countries. Increasingly, banks were competing globally, and a bank operating in a country where capital regulations were slack was considered to have a competitive ‘edge over one operating in a country with tighter and more strictly enforced capital regulations. In addition, the huge exposures of the major international banks to less developed countries such as Mexico, Brazil, and Argentina, as well as the accounting games sometimes used for those exposures, were starting to raise questions about the adequacy of capital levels.

Another problem was that the types of transaction entered into by bank wen: becoming more complicated. The over-the-counter derivatives market for produce such as interest rate swaps, currency swaps, and foreign exchange options will be growing fast. These contracts increase the credit risks being taken by a bank. ‘Consider, for example, an interest rate swap. If the counterparty in the interest rate swap transaction defaults when the swap has a positive value to the bank and a negative value to the counterparty, the bank is liable to lose money. Many of these newer transactions were «off balance sheet». This means that they had no effect or the level of assets reported by a bank. As a result, they had no effect on the level or assets reported by a bank. As a result, they had no effect on the amount of capital the bank was required to keep. It became apparent to regulators that total asset:

were no longer a good indicator of the total risks being taken. A more sophisticated approach than that of setting minimum levels for the ratio of capital to total balance-sheet assets was needed.

The design of the cross harder or transnational regulations’ was delegated to a newly established Basel Committee on Bank Supervision. ThéiBB36i Committee on Banking Supervision’ consists of senior representatives of bank supervisory authorities and central banks from Argentina, Australia, Belgium, Brazil, Canada, ' China, France, Germany, Hong Kong SAR, India, Indonesia, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, Russia, Saudi Arabia, Singapore, South ‘Africa, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. ‘It usually meets at the Bank for International Settlements (sis) in Basel, Switzerland, where its permanent Secretariat is located.

***Basel I***

The 1988 BIS Accord was the first attempt to set international risk-based standards for capital adequacy. It has been subject to much criticism as being too simple and somewhat arbitrary. In fact, the Accord was a huge achievement. It was signed by all 12 members of the Basel Committee and paved the way for signiﬁcant increases in the resources banks devote to measuring, understanding, and managing risks. The BIS Accord deﬁned two requirements that bank capital had to satisfy. The ﬁrs‘; was that the ratio of a bank’s assets to its capital had to be less than 20. This requirement was similar to that existing prior to 1988 in many countries.) The second requirement involves what is known as the Cooke ratio. For most banks there was no problem in satisfying the capital multiple requirements. The Cooke ratio was the key regulatory requirement.

In calculating the Cooke Ratio, both on-balance-sheet and off-balance-sheet items are considered. They are used to calculate what is known as the bank’s total risk

weighted assets (also sometimes referred to as the *risk-weighted amount*). It is a measure of the bank's total credit exposure.

***Risk weights for on-balance-sheet items***

***Risk weight (%) Asset category***

**0 Cash, gold, bullion, claims on OECD governments such as Treasury**

 **bonds or insured residential mortgages**

**20 Claims on OECD banks and OECD public sector entitles such as**

 **securities, issued by US government agencies or claims on**

**municipals**

**50 uninsured residential mortgage loans**

**100 All other claims such as corporate bonds and less-developed country**

 **debt , claims on non-OECD banks Real estate, premises, plant and**

 **equipment**

**Example**

The assets of a bank consists of $100 million of corporate loans, $10 million of OECD government bon ds, and $50 million of residential mortgages. The total of risk-weighted assets is

1. × 100 + 0.0 × 10 + 0.5 × 50 = 125

Or $125 million

***Capital Requirement***

The accord required banks to keep capital equal to at least 8% of the risk-weighted asset.

$$Minimum ratio= \frac{Capital }{Risk weighted assets }\geq 8\%$$

The capital had two components:

1. *Tier 1 capital.* This consists of items such as equity and noncumulative perpetual preferred stock net of good will.
2. *Tier 2 capital.* This is sometimes referred to as *supplementary capital.* It includes instruments such as cumulative perpetual preferred stock, certain types of

99 year debenture issues, and subordinated debt (i.e., debt subordinated to depositors) with an original life of more than five years.

***The 1996 Amendment***

In 1995, the Basel Committee issued a consultative proposal to amend the 1988 Accord. This became known as the I996 Amendment». It was implemented in 1998 and was then sometimes referred to as «BIS 98». The amendment involves keeping capital for assets and liabilities that are held for trading.

***Basel II***

In June 1999, the Basel Committee proposed new rules that have become known as Basel II. These were revised in January 2001 and April 2003. A number of quantitative impact studies (QISs) were carried out to test application of the new rules and the amount of capital that will be required. A final set of rules agreed to by all members of the Basel committee was published in June 2004. This was update in November 2005. Implementation of the rules began in 2007 after a further QIS.

The Basel II capital requirements apply to «internationally active» banks. In the United States, there are many small regional banks and the 'JS regulatory authorities have decided that Basel II will not apply to them, (These banks are regulated under what is termed Basel IA, which is similar to Basel I). Some of the larger regional banks are voluntarily implementing Basel II, possibly to signal to their shareholders that they manage risks in a sophisticated way. In Europe, all banks, large or small, are regulated under Basel II. Furthermore, the European Union requires the Basel II rules to be applied to securities companies as well as banks.

Basel II is based on three pillars:

1. Minimum capital requirements

2. Supervisory review

3. Market discipline

In Pillar 1 the minimum capital requirement for credit risk in the banking book is calculated in a new way that reflects the credit ratings of counterparties. The capital requirement for market risk remains unchanged from the 1996 Amendment and there is a new capital charge for operational risk. The general requirement in Basel I that banks hold a total capital equal to 8% of risk-weighted assets (RWA) remains unchanged. When the capital requirement for a. risk is calculated in a way that does not involve RWAs, it is multiplied by 12.5 to convert it to an RWA. As a result, it is always the case that:

 *Total capital*

$$=0.08×(credit risk RWA+Market risk RWA+operational risk RWA)$$

Pillar 2, which is concerned with the-supervisory review process, allows regulators in different countries some discretion in how rules are applied (so that they can take account of local conditions), but seeks to achieve overall consistency in the application of the rules. It places more emphasis on early intervention when problems arise. ‘Supervisors are required to do far more than just ensuring that the minimum capital required under Basel II is held. Part of their role is to encourage banks to develop and use better risk management techniques and to evaluate these techniques. They should evaluate risks that are not covered by Pillar 1 enter into an active dialogue with banks when deficiencies are identiﬁed.

Pillar 3, market discipline, requires banks to disclose more information about the way they allocate capital and the risks they take. The idea here is that banks will be subjected to added pressure to make sound risk management decisions if shareholders and potential shareholders have more information about those decisions.

***Credit risk capital under Basel*** ***II***

For credit risk, banks have three choices under Basel II:

1. The standardized approach
2. The foundation internal ratings based (IRE) approach
3. The Advanced IRB approach

For the standardized approach, risk weights are largely a function of external ratings.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Credit  | AAA toAA- | A+ to A- | BBB+BB+ | Below BB- | Unrated |
| Risk weight  | 20% | 50% | 100% | 150% | 100% |

For the IRB approaches:

* Risk weights :1 function of internal credit ratings
* Theoretically unlimited number of grades (minimum 7 for performing, loans)
* Foundation IRB - banks estimate of probability of default
* Advanced IRB - banks also estimate loss given default and exposure at default

# **UNIT 13; BASEL III**

One of the main reasons the economic and financial crisis, which began in 2007, became severe was that the banking sectors of many countries had built up excessive on and off-«balance sheet leverage. This was accompanied by a gradual erosion of the level and quality of the capital base. At the same time, many banks were holding insufficient liquidity buffers the banking system therefore was not able to absorb the resulting systemic trading and credit losses nor could it cope with the reinter mediation of large off-balance sheet exposures that had built up in the shadow banking system. The crisis was further ampliﬁed by a procyclical deleveraging process and by the interconnectedness of systemic institutions through an array of complex transactions. During the most severe episode’ of the crisis, the market lost conﬁdence in the solvency and liquidity of many banking institutions The weaknesses in the banking sector were rapidly transmitted to the rest of the ﬁnancial system and the real economy, resulting in a massive contraction of liquidity and credit availability. Ultimately the public sector had to step in with unprecedented injections of liquidity: capital support and guarantees, exposing taxpayers to large losses.

In response to these shortcomings, the Committee in July 2009 completed it number of critical reforms to the Basel II framework. The new framework is what is now known as Basel II]. These reforms will use capital requirements for the trading book and complex securitization exposures, a major source of losses for many internationally active banks. The enhance treatment introduces a stressed value-at-risk (VaR) capital requirement based on a continuous 12-month period of signiﬁcant ﬁnancial stress. In addition, the Committee has introduced higher capital requirements for so-called securitizations in both the banking and tin: trading book. The reforms also raise the standards of the Pillar 2 supervisor, review process and strengthen Pillar 3 disclosures. The Pillar l and Pillar

enhancements; must be implemented by the end of 2011; the Pillar 2 standards became effective when they were introduced in July 2009. The Committee is also conducting a fundamental review of the trading book. The work on the fundamental review of the trading book is targeted for completion by year-end 2011. It is critical that banks’ risk exposures are backed by a high quality capital base. The crisis demonstrated that credit losses and write downs come out of retained earnings, which is part 01' banks’ tangible common equity base. It also revealed the inconsistency in the deﬁnition of capital across jurisdictions and the lack of disclosure that would have enabled the market to fully assess and compare the quality of capital "between institutions. To this end, the predominant form of Tier l capital must be common shares and retained earnings. This" standard is reinforced through a set of principles that also can be tailored to the context of T1027." joint stock companies to ensure they hold comparable levels of high quality Tier I capital. Deductions from capital and prudential ‘filters have been harmonized internationally and generally applied at the level of common equity or its equivalent in the case of non—joint stock companies. The remainders of the Tier 1 capital base must be comprised of instruments that are subordinated, have fully discretionary noncumulative dividends or coupons and have neither a maturity date nor an incentive to redeem. Innovative hybrid capital instruments with an incentive to redeem through features such as step-up clauses, currently limited to 15% of tile Tier 1 capital base, will be phased out. In addition; Tier 2 capital instruments will be harmonized and so-called Tier 3 capital instruments, which were only available to cover market risks, eliminated. Finally, to improve market discipline, the transparency of the capital base will be improved, with all elements of capital required to be disclosed along with a detailed reconciliation to the reported accounts.

**UNIT 14: RISK MANAGEMENT SYSTEMS OF FINANCIAL SERVICE PROVIDERS**

In order to promote sound risk management practices in ﬁnancial institutions in Zambia, the Bank of Zambia issued the Banking and Financial Services Risk. Management Guidelines in 2008. The guidelines were issued in line with the Bank of Zambia’s move to move towards implementing it risk based regulatory approach. These guidelines apply to only those ﬁnancial service providers regulated by the Bank of Zambia. Financial Service Providers for the purpose of these guidelines refer to commercial banks, ﬁnancial institutions and ﬁnancial businesses.

The guidelines set out the minimum requirements for risk management system: and frameworks that FSP are supposed to have in place. The guidelines are in line with international best practices that why the BOZ requires each FSP to have an independent risk management structure that concentrates fully on the risk; management function and develop its own risk management programme to suit 37 own needs and circumstances.

**Deﬁning risk**

For the purpose of these guidelines ﬁnancial risk. in a banking organization i possibility that the outcome of an action or event could bring up adverse impact Such outcomes could either result in a direct loss of earnings / capital or may reo- in imposition of constraints on bank’s ability to meet its business objectives. xxxxxxx constraints pose a risk as these could hinder a bank's ability to conduct its on- xxxx business or to take benefit of opportunities to enhance its business.

**Types of bank losses**

Regardless of the sophistication of the measures, banks often; distinguish between expected and unexpected losses. Expected losses are those that the bank know with reasonable certainty will occur (e.g., the expected default rate of corporate loan portfolio or credit card portfolio‘) and are typically reserved for in some manner. Unexpected losses are those associated with unforeseen events (e.g. losses experienced by banks in the aftermath of nuclear tests, Losses due to a sudden down turn in economy or falling interest rates). Banksrely on their capital as a ‘buffer to absorb such losses.

**Types of bank risks**

Risks are usually deﬁned by the adverse impact on proﬁtability of several distinct sources of uncertainty. While the types and degree of risks and organization may be exposed to depend upon a number of factors such as its size, complexity business activities, volume etc, it is believed that generally the banks face the following risks:

1. Credit risk;
2. Market risk
3. Liquidity risk;
4. Operational risk;
5. Compliance/ legal /regulatory risk;
6. Reputation risks.

Before overarching these risk categories in later units, given below are some basics about risky management and some guiding principles to manage risks in banking organizations, **Commercial bank risk management**

Risk Management is a discipline at the core of every ﬁnancial institution and encompasses passes all the activities that affect its risk proﬁle. It involve identification measurement, monitoring and controlling risks to ensure that:

1. The individuals who take or manage risks clearly understand it;
2. The organization’s Risk exposure is within the limits established by Boards, Directors
3. Risk taking decisions are in line with the business strategy and objectives set by BOD;
4. The expected payoffs compensate for the risks taken;
5. Risk taking decisions are explicit and clear;
6. Sufficient capital as a buffer is available to take risk.

The acceptance and management of ﬁnancial risk is inherent to the business of banking and banks’ roles as financial intermediaries. Risk management as commonly perceived does not mean minimizing risk; rather the goal of risk management is to’ optimize risk-reward trade -off. Notwithstanding the fact that banks are in the business of taking risk, it should be recognized that an institution need not engage in business in a manner that unnecessarily imposes risk upon it: nor it should absorb risk that can be transferred to other participants. Rather it should accept those risks that are uniquely part of the array of bank’s services.

**Bank risk management hierarchy levels**

In every ﬁnancial institution, risk management activities broadly take place simultaneously at following different hierarchy levels:

1. ***Strategic level***: It encompasses risk management functions performed by senior management and BOD. For instance definition of risks, as certain in institution risk appetite, formulating strategy and policies for managing risks and establish adequate systems and controls to ensure that overall risk remain within acceptable level and the reward compensate for the risk taken.
2. ***Macro Level:*** It encompasses risk management within a business area or across business lines. Generally the risk management activities performed by middle, management or units devoted to risk reviews fall into this category.
3. ***Micro Level***: It involves On-the-line risk management where risks area actually created. This is the risk management activities performed by individuals who take risk on organization’s behalf such as front office and loan origination functions. The risk management in those areas is confined to following operational procedures and guidelines set by management.

**UNIT 15: BASIC ELEMENTS OF A SOUND RISK MANAGEMENT SYSTEM OF A BANK**

Expanding business arenas, deregulation and globalization of ﬁnancial activities emergence of new ﬁnancial products and increased level of competition has necessitated a need for an effective and structured risk management in ﬁnancial institutions. A bank’s ability to measure, monitor, and steer risks comprehensively is becoming a decisive parameter for its strategic positioning. The risk management framework and sophistication of the process, and internal controls, used to manage risks, depends on the nature, size and complexity of institutions activities. Nevertheless, there are some basic principles that apply to all ﬁnancial institutions irrespective of their size and complexity of business and are reflective of the strength of an individual bank's risk management practices:

1. **Board and senior Management oversight.**
2. To be effective, the concern and tone for risk management must start at the top. While the overall responsibility of risk management rests with the BOD, it is the duty of senior management to transform strategic direction set by board in the shape of policies and procedures and to institute an effective hierarchy to execute and implement those policies. To ensure that the policies are consistent with the risk tolerances of shareholders the same should be approved from board’:
3. The formulation of policies relating to risk management only would not solve the purpose unless these are clear and communicated down the line. Senior management has to ensure that these policies are embedded in the culture of organization. Risk tolerances relating to quantiﬁable risks are generally communicated as limits or sub-limits to those who accept risks on behalf of organization. However not all risks are quantifiable. Qualitative risk measures ensures effective monitoring and control over risks being taken. The individuals responsible for review function (Risk review, internal audit, compliance etc.) should be independent from risk taking units and report directly to board or senior management who are also not involved in risk taking.
4. There should be an effective management information system that ensures flow of information from operational level to top management and a system to address any exceptions observed. There should be an explicit procedure regarding measures to be taken to address such deviations.
5. The framework should have a mechanism to ensure an on-going review of systems, policies and procedures for risk management and procedure to adopt changes.
6. Integration of Risk Management Risks must not be viewed and assessed in isolation,‘ not only because a single transaction might have a number of risks but also one type of risk can triggerothei risks. Since interaction of various risks could result in diminution or increase in risk, the risk management process should recognize and reﬂect risk interactions in all business activities as appropriate. While assessing», and managing risk the management should have an overall view of risks t1’lCll‘lSl.it1llLll in is exposed to. This requires having a structure in place to look at risk inter relationships across the organization.
7. ***Business Line Accountability***

In every banking organization there are people who are dedicated to risk management activities, such as risk review, internal audit etc. It must not be constructed that risk management is something to be performed by few individuals or a department. Business lines are equally responsible for Li. Risks they are taking. Because line personnel, more than anyone else, understand the risks of the business, such a lack of accountability can lead to problems could be communicated as guidelines and inferred from management business decisions.

1. To ensure that risk taking; remains within limits set by senior management /BOD, any material exception to the risk management policies and tolerances should be reported to the senior management/board who in turn must trigger appropriate corrective measures. These exceptions also serve as an input to judge the appropriateness of systems and procedures relating to risk management.
2. To keep these policies in line with signiﬁcant changes in internal and external environment, BOD is expected to review these policies and make appropriate changes as and when deemed necessary. While a major change in internal or external factor may require frequent review, in absence of any uneven circumstances it is expected that BOD re-evaluate these policies every year.
3. **Risk Management framework**

A risk management framework encompasses the scope of risks to be managed, the process/systems and procedures to manage risk and the roles and responsibilities of individuals involved in risk management. The framework should be comprehensive enough to capture all risks a bank is exposed to and have ﬂexibility to accommodate any change in business activities. An effective risk management framework includes

1. Clearly deﬁned risk management policies and procedures covering risk identiﬁcation, acceptance, measurement, monitoring, reporting and control.
2. A well constituted organizational structure deﬁning I clearly roles and responsibilities of individuals involved in risk taking as well as managing it. Banks, in addition to risk management functions for various risk categories may institute a setup that supervises overall risk management at the bank. Such a setup could be in the form of a separate department or bank’s Risk Management Committee (RMC) could perform such function.
3. **Risk Evaluation/Measurement**

Until and unless risks are not assessed and measured it will not be possible to control risks. Further a true assessment of risk ‘gives management a clear view institutions standing and helps in deciding future action plan. To adequately capture institutions risk exposure, risk measurement should represent aggregate exposure of institution both risk type and business line and encompass short run as well as long run impact on institution. To the maximum possible extent institutions should establish systems / models that quantify their risk proﬁle, however, in some risk categories such as operational risk, quantification is quite difficult and complex. Wherever it is not possible to quantity risks, qualitative measures should be adopted to capture those risks. Whilst quantitative measurement systems support effective decision- making, better measurement does not obviate the need for well-informed. Qualitative judgment. Consequently the importance of staff having relevant knowledge and expertise cannot be undermined. Finally any risk measurement framework, especially those which employ quantitative techniques/model, is only as good as its underlying assumptions, the rigor and robustness of its analytical methodologies, the controls surrounding data inputs and it: appropriate application.

1. **Independent review**

One of the most important aspects in risk management philosophy is to makes xxxxx that those who take or accept risk on behalf of the institution are not the ones measure, ‘monitor and evaluate the risks. Again the managerial structure in hierarchy of risk review function may vary across banks depending upon their size and nature of\_ the business, the key is independence. To be effective the review functions should have sufficient authority, expertise and corporate stature so that the identiﬁcation and reporting of their ﬁndings could be accomplished without any hindrance. The findings of their reviews should be reported to business units, Senior Management and, where appropriate the Board.

1. ***Contingency planning***

Institutions should have a mechanism to identify stress situations ahead of-time and plans to deal with such unusual situations in a timely and effective manner. Stress situations to which this principle applies include all risks of all "types. For instance contingency planning activities include disaster recovery planning, public relations damage control, litigation strategy, responding to regulatory criticism etc. Contingency plans should be reviewed regularly to ensure they encompass reasonably probable events that could impact the organization. Plans should be tested as to the appropriateness of responses, escalation and communication channels and the impact on other parts of the institution.

# **UNIT 16: MANAGING CREDIT RISK**

**What is Credit risk?**

Credit risk arises from the potential that a borrower is either unwilling toper form on an obligation or their ability to perform such obligation is impaired resulting in economic loss to the bank.

In a bank’s portfolio, losses stem from outright default due to inability or unwillingness of a customer or counter party to meet commitments in relation to lending, trading, settlement and other ﬁnancial transactions. Alternatively losses may result from reduction in portfolio value due to actual or perceived deterioration in credit quality. Credit risk emanates from a bank’s dealing with individuals, corporate, ﬁnancial institutions or a sovereign. For most banks, loans are the larges: and most obvious source of credit risk; however, credit risk should stem from activities both on and off balance sheet. In addition to direct accounting loss, credit risk should be viewed in the context of economic exposures. This encompasses opportunity costs, transaction costs and expenses associated with non-performing asset over and above the accounting loss. Credit risk not: necessarily occurs in isolation. The same source that endangers credit risk for the institution may also expose it to other risk. For instance a bad portfolio may attract liquidity problem.

**Components of credit risk management in a bank**

Atypical Credit risk management framework in a financial institution may we broadly categorized in o following main components.

1. Board and senior management’s oversight
2. Organizational structure
3. System and procedures for identification, acceptance, measurement, monitoring and control risks
4. ***Board and Senior Management’s Oversight***

It is the overall responsibility of bank‘s Board to approve bank’s credit risk strategy and signiﬁcant policies relating to credit risk and its management which should be based on, the banks overall business strategy. To keep its current, the overall strategy has to be reviewed by the board, preferably annually. The responsibilities of the Board with regard to credit risk management shall, includes

1. Delineate bank’s overall risk tolerance in relation to credit risk;
2. Ensure that hank’s overall credit risk exposure is maintained at prudent levels and consistent with the available capital;
3. Ensure that top management as well as individuals responsible for credit risk management possess sounds expertise and knowledge to accomplish the risk management function;
4. Ensure that the bank implements sound fundamental principles that facilitate tie. identiﬁcation, measurement, monitoring and control of credit risk;
5. Ensure that appropriate plans and procedures for credit risk management are in place.

The very ﬁrst purpose of bank’s credit strategy is to determine the risk appetite the bank. Once it is determined the bank could develop a plan to optimizer xxxxx while keeping credit risk within predetermined limits. The bank’s credit strategy thus should spell out:

1. The institution’s plan to grant’ credit based on various; client segments products, economic sectors, geographical location, currency aid maturity
2. Target market within each lending segment; preferred of diversiﬁcation/concentration.
3. Pricing strategy.

The senior management of the bank should develop and establish or Policies and credit administration procedures as a part of’ overall credit management framework and get those approved from board. Such policies

Procedure shall provide guidance to the staff on various types of lending, including corporate, SME, consumer, agriculture, etc. At minimum the policy should include:

1. Detailed and formalized credit evaluation/ appraisal process.
2. Credit approval authority at various hierarchy levels including authority for approving exceptions.
3. Risk identiﬁcation, measurement, monitoring and control.
4. Risk acceptance criteria.
5. Credit origination and credit administration and loan documentation procedures.
6. Roles and responsibilities units/staff involved in origination and management of credit.
7. Guidelines on management of problem loans.
8. ***Organizational structure***

Each bank depending upon its size, should constitute a Credit Risk Management: Committee: (CRMC), ideally comprising of head of credit risk management Department, credit department and treasury. This committee reporting to bank’s risk management committee should be empowered to oversee credit risk taking activities and overall credit risk management function. The CRMC should be mainly responsible for:

1. The implementation of the credit risk policy / strategy approved by the Board;
2. Monitor credit risk on a bank-wide basis and ensure compliance with limit. approved by the Board; A
3. Recommend to the Board, for its approval, clear policies on standard for presentation of credit proposals, ﬁnancial ‘covenants, rating standards and benchmarks.
4. Decide delegation of credit approving powers, prudential limits on large credit exposures, standards for loan collateral, portfolio management, loan review mechanism, risk concentrations, risk monitoring and evaluation, pricing of loans, provisioning, regulatory/legal compliance ,etc.

Further, to maintain credit discipline and to enunciate credit risk management and control process there should be a separate function independent of loan origination function. Credit policy formulation, credit limit setting, monitoring of credit exceptions / exposures and review /monitoring of documentation are functions that should be performed independently of the loan origination function. For small banks where it might not be feasible to establish such structural hierarchy, there should be adequate compensating measures to maintain credit discipline introduce adequate checks and balances and standards to address "potential conflicts of interest. Ideally, the banks should-institute a Credit Risk Management Department. (CRMD), typical functions of CRMD include:

1. To follow a holistic approach in management of risks inherent in bank’s portfolio and ensure the risks remain within the boundaries established by the Board or Credit Risk Management Committee.
2. The department also ensures that business lines comply with risk parameters and prudential limits established by the Board or CRMC.
3. Establish systems and procedures relating to risk identiﬁcation, Management. Information System, monitoring of loan / investment portfolio quality and early warning. The department would work out remedial measure review deﬁciencies/problems are identified.
4. The Department should undertake portfolio evaluations and conduct comprehensive studies on the environment to test the resilience of the loan portfolio.

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# **UNIT 17: SYSTEMS AND PROCEDURE FOR CREDIT RISKS**

The following are the systems and procedures for identiﬁcation, acceptance, measurement, and monitoring and control-of credit risk:

**Credit Origination**

Banks must operate within a sound and well-deﬁned criteria for new credits as well as the expansion of existing credits. Credits should be extended within the target markets ant lending strategy of the institution. Before allowing a credit facility, the bank must make an assessment of risk profile of the customer/transaction. This may include:

1. Credit assessment of the borrower’s industry, and macro-economic factors,
2. The purpose of credit and source of repayment.
3. The track record / repayment history of borrower.
4. Assess/evaluate the repayment capacity of the borrower.
5. The Proposed terms and conditions and covenants.
6. Adequacy and enforceability of c collaterals.
7. Approval from appropriate authority

**Limit setting**

An important element of credit risk management is to establish exposure limits for single borrowers and group of connected borrowers. Institutions are expected to develop their own limit structure while remaining within the exposure limits set by the Bank of Zambia. The size of the limits should be based on the credits strength of the borrower, genuine requirement of credit, economic conditions and the institution’s risk tolerance. Appropriate limits should be set for respective products and activities. Institutions may establish limits for a -specific industry, economic sector or geographic regions to avoid concentration risk.

Credit limits should be reviewed regularly at least annually or more frequently if borrower’s credit quality deteriorates. All requests of increase, in credit limits should be substantiated.

**Credit Administration**

On-going administration of the credit portfolio is an essential part of the credit process. Credit administration function is basically a back office activity that support and control extension and maintenance of credit. A typical credit administration unit performs following functions:

1. Documentation. It is the responsibility of credit administration to ensure completeness of documentation (loan agreements, guarantees, transfer of title of collaterals etc.) in accordance with approved terms and conditions.
2. Credit Disbursement. The credit administration function should ensure that the loan application has proper approval before entering facility limits into computer systems. Disbursement should be effected only after completion of covenants, and receipt of collateral holdings. In case of exceptions necessary approval should be obtained from competent authorities.
3. Credit monitoring. After the loan is approved and draw down allowed, the loan should be continuously watched over. These include keeping track of borrower’s compliance with credit terms, identifying early signs of irregularity conducting periodic valuation of collateral and monitoring timely repayments.
4. Loan Repayment. The borrowers should be communicated ahead of time as and when the principal/mark up instalment becomes due. Any exceptions such as non- payment or late payment should be tagged and communicated to the management, Proper records and updates should also be made after receipt.
5. Maintenance of Credit Files. Institutions should devise procedural guidelines and standards for maintenance of credit ﬁles. The credit ﬁles not only include all correspondence with the borrower but should also contains sufficient information necessary to assess ﬁnancial health of the borrower and its repayment performance. It need not mention that information should be filed in organized way so that external / internal auditors or SBI’ inspector could review it easily.
6. Collateral and Security Documents. Institutions should ensure that all security documents are kept in a ﬁreproof safe under dual control. Registers for documents should be maintained to keep track of their movement. Procedures should also be established to track and review relevant insurance coverage for certain facilities/collateral. Physical checks on security documents should be conducted on a regular basis.

**Measuring credit risk**

The measurement of credit risk is of vital importance in credit risk management. A number of qualitative and quantitative techniques to measure risk inherent in credit portfolio are evolving. To start with, banks should establish a credit risk rating framework across all type of credit activities among other things, the rating framework may, incorporate:

Business Risk

* Industry Characteristics
* Competitive Position (e.g. marketing/technological edge)
* Management

Financial Risk

* Financial condition -
* Proﬁtability
* Capital Structure
* Present and future Cash ﬂows

An internal rating framework would facilitate banks in a number of ways such as:

1. Credit section
2. Amount of exposure
3. Tenure and price of facility
4. Frequency or intensity of monitoring
5. Analysis of migration or deteriorating credits and more accurate computation of future loan loss provision
6. Deciding the level of Approving authority of loan.

**Credit Risk Monitoring & Control**

Credit risk monitoring refers to incessant monitoring of individual credits inclusive of Off-Balance sheet exposures to borrowers as well as overall credit portfolio of the bank. The banks credit policy should explicitly provide procedural guideline relating to credit risk monitoring. At the minimum it should lay down procedure relating to:

1. The roles and responsibilities of individuals responsible for credit risk monitoring;
2. The assessment procedures and analysis techniques (for Individual loans & overall portfolio);
3. The frequency of monitoring;
4. The periodic examination of collaterals and loan covenants;
5. The frequency of site visits;
6. The identiﬁcation of any deterioration in any loan.

Given below are some key indicators that depict the credit quality of a loan:

1. Financial Position and Business Conditions. The most important aspect about a borrower is its financial health, as it would determine its repayment capacity. Consequently institutions need carefully watch ﬁnancial standing of borrower. The Key ﬁnancial performance indicators on proﬁtability, equity, leverage and liquidity / should be analyzed. While making such analysis due consideration should be given to business/industry risk, borrower’s position within the industry and external factors such as economic condition, government policies and regulations.
2. Conduct of Accounts. In ease of existing borrower the operation in the account would give a fair idea about the quality of credit facility institutions should monitor the borrower’s account activity, repayment history and instances of excesses over credit limits. For trade ﬁnancing, institutions should monitor cases of repeat extensions of due dates tor trust receipts and bills.
3. Loan Covenants. The borrower’s ability to adhere to negative pledges and ﬁnancial covenants stated in the loan agreement should be assessed, and any breach detected should be addressed promptly.
4. Collateral valuation. Since the value of collateral could deteriorate resulting in unsecured lending, banks need to reassess value of collaterals on periodic basis. The frequency of such valuation is very subjective and depends upon nature of collaterals.

**Risk review**

The institutions must establish a mechanism of independent, on-going assessment of credit risk management process. All facilities except those managed on a portfolio basis should be subjected to individual risk review at least once in a year. The results of such review should be properly documented and reported directly to board, or its subcommittee or senior management without lending authority. The purpose of such reviews is to assess the credit administration process, the accuracy of credit rating and overall quality of loan portfolio independent of relationship with the borrower.

**Delegation of Authority**

Banks are required to establish responsibility for credit sanctions and delegate authority to approve credits or changes in credit terms. It is the responsibility of banks board to approve the overall lending authority structure, and explicitly delegate credit sanctioning authority to senior management and the credit committee. **Managing problem credits**

The institution should establish a system that helps identify problem loan ahead of time when there may be more options available for remedial measures. Once the loan is identiﬁed as problem, it should be managed \_under a dedicated remedial process. A problem loan management process encompass following basic elements:

1. Negotiation and follow-up, Proactive effort should be taken in dealing with borrowers to implement remedial plans, by maintaining frequent contact and internal records of follow-up actions. Often rigorous efforts made at an early stage prevent institutions from litigations and loan losses.
2. Workout remedial strategies. Sometimes appropriate remedial strategies such as restructuring of loan facility enhancement in credit limits or reduction in interest rates, help improve borrower’s repayment capacity. However it depends upon business condition, the nature of problems being faced and most importantly borrower’s commitment and willingness to repay the loan. While such remedial strategies often bring up positive results, institutions need to exercise great caution in adopting such measures and ensure that such a policy must not encourage borrowers to default intentionally. The institution’s interest should be the primary consideration in case of such workout plans. It needs not mention here that competent authority, before their implementation, should approve such workout plan.
3. Review of collateral and security document. Institutions have to ascertain the loan recoverable amount by ‘updating the values of available collateral with formal valuation. Security documents should also be reviewed to ensure the completeness and enforceability of contracts and collateral/guarantee
4. Status Reports and Review Problem credits should be subject to more frequent review and monitoring. The review should update the status and development of the loan accounts and progress of the remedial "plans. Progress made on problem loan should be reported to the senior management

# **UNIT 18: THE PRINCIPLES OF GOOD LENDING**

When a bank is asked to lending money, it must reach a decision about whether or not to respond favourably to the request. The answer should be “y as” if the lending proposition is sound. Certain principles of good lending should guide a decision about whether or not to lend money, Since the purpose of lending is to earn interest and so make a profit, it follows that these principles of good lending should be concerned with ensuring, as far as it is possible to do so, that the borrower will be able to make the scheduled repayments, in full and within the required period of time.

**The lending proposition**

Although a bank might try to encourage customers to ask for a loan or an overdraft (e.g. by television advertising, or by sending a mail short of letters or brochures about personal loans to selected customers) the initial specific lending/borrowing proposition must come from the customer himself. It is then the task of the bank to decide whether:

* the proposition is acceptable in its current form;
* the proposition would be acceptable if it were amended; or
* the proposition is not acceptable.

**The banker’s judgment in a lending decision**

It is worth stressing from the outset that in deciding whether or not to lend money, a banker must use his judgment. Hopefully, however, his judgment will be sound, based on a careful assessment of facts. Facts will be obtained from the customer himself (either from his *original* proposition, or from subsequently personal interviews or correspondence) and from any available ﬁnancial records. To help him in his assessment of the banking proposition from a customer, the banker will or might have access to: - -Details of the customer’s bank account (unless the customer currently banks elsewhere);

* Details of the ﬁnancial position of a business customer, as show in a profit and loss account and a balance sheet for each of the last few years;
* Management ﬁgures for the business, provided to the bank by the customer ~ c. g. monthly ﬁgures for sale, debtors, creditors etc.
* Details of *budgeted* income and expenditure, either for the customer’s business as a whole or for a particular capital expenditure project which the proposed advance would help to ﬁnance.

In practice, cash budgets and other -financial forecasts are not easy to get out of small business customers, who are alien not used to preparing ﬁnancial statements. But a banker ought to ask for them. After all, why should a bank lend money to a business customer who hasn’t thought properly about the future of his business, the cash it will need, and the proﬁts it ought to make‘?

**Lending guidelines**

There are also certain guidelines to help the banker towards his lending decision. Although these guidelines are not infallible, and do not have to be allowed religiously, they do provide useful pointers which a banker should refer to and consider. When a banker receives a proposition from a customer who wants to borrow money, he should consider:

* *the amount of the loan*. The proposition must state exactly how much the customer wants to borrow. The banker must verify, as far as he is able to do so. that the full amount required has been estimated correctly;
* *the customer‘s stake*. A bank should not want to lend money to a customer when isn’t able or willing to invest and risk some of his own money too. The customer ought to have a stake in the cost of the investment for which the ﬁnance is needed.

(l00% loans to personal customers are not unknown, but they could be risky for the lending bank);

* *the purpose of the loan*. So me loan requests should be refused because the purpose of the loan would not be acceptable to the bank;
* *what would be the term of the loan?* Traditionally, bank have lent “short” i.e. short term loans or overdrafts although more recently, longer-term lending to companies (medium-term loans) and private customers (mortgages) has been common;
* *how would the loan be repaid?* Would the customer be able to obtain sufficient income to make the necessary repayments‘? If not, the loan request should be refused;
* *does the loan require security?* If so, is the proposed security adequate?
* *does the character and past record of the customer* suggest that he could be relied on to make the loan repayments on schedule?
* *do the business or family connections of the customer* suggest that he or she should be given the required’ loan?

These guidelines will now be considered in some greater detail,

**How much is needed**?

The customer must specify how much money he wants to borrow. It is not for the banker to suggest how much he would be prepared to lend. No matter whether the proposition is considered at branch level or at a higher level in the bank’s organization, the bank must ask the customer from the outset to put forward a complete proposition if you think about it carefully, you should see the commercial sense behind this. The bank has to consider the customer’s proposition as a whole, and this must include details about total cost, the customer’s own ﬁnancial stake, the bank’s share of the cost and the repayment terms. Just because the customer might be able to provide adequate security for an even large advance does not me in that the bank should offer him more money than he needs.

The banker ought to consider whether the customer has asked for as much as he really needs. Suppose, for example, that a bank agrees to advance £15,000 to a small business customer, only to find that the customer comes back several months later asking for more money, say a further £10,000, because he had underestimated his costs, or the amount of working capital he needed to invest. The bank might then be faced with the choice between lending even more money, to keep the customer’s venture afloat, or to take action against the customer to recover its money. It would have been far preferable for the bank to have considered the customer’s initial proposition as a request for an advance of £25,000, and to have made a decision accordingly.

The most suitable methods of trying to decide whether a business customer has asked for an advance for as much as he really needs are:

* Studying ‘ he budgets (if any) prepared by the customer;
* Studying the balance sheet of the customer, and his likely working capital position and liquidity after the advance has been made.

If the banker suspects that the customer will be short of liquid funds, he should suggest to the customer that the might have estimated his borrowing requirements incorrectly

**Capital: the customer’s stake**

When a customer asks for an advance, he should usually be expected to put up some money himself towards the total capital expenditure or investment. There are several reasons why this makes good sense‘.

* The bank should not be expected to provide risk capital. If an investment by the customer goes wrong,’ and the customer has none of his own money in the investment, the “loss” would be borne by" the bank, if the customer ﬁnds himself unable to repay the loan advance. On the other hand, if the customer has a substantial stake himself in the investment, losses would first be borne by the customer before the bank’: stake is endangered. Investments rarely lose everything. Something can usually be salvage even out of a disaster, and so provided that the size of the customer’s stake is adequate, the bank should be able to recover its money, if the worst -came to the worst, out of the salvage value of the failed investment.
* If the customer puts some of his own money into a venture, he is more likely to put his greatest efforts into ensuring that the venture succeeds. A financial commitment induces greater personal commitment.

 The size of the customer’s stake will depend on a variety of circumstances, and it is worth considering business customers and personal customers separately.

* *Business customers*. A general guideline is that a bank should not lend more money than the customer has invested in his business himself, even when the bank has obtained adequate security.
* *Personal customers*. With personal lending, rather different considerations apply, because the bank will often be relying of the customer’s income from salary or wages to repay the loan, and not from the “profits” of the investment itself. Provided that there is adequate security, a bank will be prepared to meet a greater proportion of the total expenditure. However, in lending to business customers, and personal customers, whatever the agreed size of the bank’s share of the total cost, one golden rule should usually apply. The customer should usually contribute enough to ensure that bank’s stake is not put at risk, allowing for the security provided.

**What is the purpose of the advance?**

The customer must specify the purpose of the advance he wants the bank to make: to him. This is a requirement for personal loans as well as business loans. In the case of an advance to a business, the purpose of the loan might give some indication about the customer's ability to repay it.

* If a customer asks for an advance in order to purchase a fixed asset, the bank must be satisﬁed that the business will be able to use the asset to improve its turnover and proﬁts sufficiently in order to repay the loan on the speciﬁed terms.

However, if at customer asks for an advance to:

* Repay another loan; -
* Pay a tax bill; or
* Pay a dividend to shareholders,

he would be risking the bank to become a creditor of his business just so that some other creditors can be paid off or the shareholders rewarded.

The trade of the business would not benefit from 1:16 bank advance, and so there might be doubts about its ability to generate enough cash to make its scheduled payments to the bank.

* If a customer asks for an overdraft to pay off his trade creditors, the bank should want to know why the business could not do this out of its regular trading income. The customer would be asking the bank to become a creditor of the business in place of the other trade creditors, as so it ought to make sure that the current cash shortage of the business is not caused by trading losses.
* If the intended purpose of an advance is to finance extra stock-holding, or a larger volume of debtors, the bank should consider the liquidity of the business, and its likely ability to ﬁnd the cash to make the scheduled repayments.
* A loan to set up a new business venture should be viewed in the context that all new ventures are risky, and most of them fail to make proﬁts and survive. Loan for certain other purposes should also be turned down, These are:
* loans for illegal purpose must always be refused. This should be a self-evident point. There would be the twin dangers of:
* Criminal prosecution, and
* The inability of the customer to repay the loan, when his illegal activities are brought to a halt.

Loans for speculative purposes should usually be refused. A customer might ask for money to speculate (e.g by purchasing “futures” in foreign currency or commodity goods such as tea, cocoa, cotton etc., or by purchasing stocks and shares). A bank should not usually put money into speculative investments:

* If the investment ﬂops, the customer might be unable to repay the loan;
* If the investment succeeds in making a huge proﬁt, the customer will take the profit himself. The bank would only get its loan capital repaid with the agreed amount of interest.
* A loan to a company for a reason which is not permitted by the “objects” clause in its Memorandum of Association. A company should not pursue activities which are outside the scope of its objects (and so “ultra vires”). A banker should check the company’s Memorandum of Association, if a company asks for an advance to ﬁnance a new venture in a different market or industry from its current activities. If he considers the intended venture to be outside the scope of the company’s objects, he should refuse an advance.

**The term of the advance**

If a customer asks for a loan, the term of the loan must be acceptable to the bank. Much bank lending is still short-term, but the “traditional” preference of banks for overdrafts and short-term loans has given way to a readiness to consider a longer repayment period.

* Mortgages for house purchases might be repayable over 20 years or more.
* There has been an increase in the amount of medium-term lending to business customers (i.e. about 5-7 years.
* Personal loans might be granted for a term of up to 5 years or so.

Whatever the term of the loan or over draft ability, there must be clear agreement between the banker and the customer about what the term should be, the term of the advance must be settled in order to establish what the periodic repayments should be. «In the case of a loan, these will consist partly of interest and partly of capital repayments. In the early stages, the “repayment” will consist mostly of interest with only a little capital repayment. As time progresses, however, more and more of the “repayment” will represent capital paid back, and correspondingly less will be for interest).

**Repayment of the advance: ability to repay**

This is the most important consideration in the lending decision. There is no point in lending money to a customer if it seems unlikely that the customer will be able to afford the repayments. Even if a bank is offered adequate security for an advance, ‘it would be inappropriate to agree to the advance if the banker judges that he will probably need to make use of the security offered and to realize (sell off: the customer’s assets. Security should be a “safety net” in the event of an unfortunate 'possible outcome; it must not be the bank’s most likely source of repayment when it makes the advance.

Since the ability of a customer to make the scheduled repayments is the most important consideration in the lending decision, a banker must study this aspect of the lending: proposition most carefully. *The source of repayment must be clear from the outset*:

* In the case of a personal customer, the source of repayment will probably be the customer’s regular income, probably has monthly after-tax salary.
* In the case of a business customer, the source of repayment will probably be the profits of the business (which ought to result in net cash receipts by the business).

A banker should look for *evidence* that the source of repayment is likely to be sufficient. In your examination, this could mean having to estimate what the annual (or monthly) payment of ‘interest and capital will be.

If the banker is satisfied that the customer should be capable of meeting the planned repayments schedule, he should try to ensure that the customer’s funds are paid direct to the bank i.e. that the customer uses an account with the bank, into which his regular income or trading receipts will then be paid. In this way:

* The bank will be able to monitor the progress of the loan repayments more easily, and identify difficulties as soon as they arise;
* There will be no likelihood that the customer, in spite of earning the income he anticipated, fails to use the income to make the planned repayments to the bank.

**Ability to repay: personal customers**

If a personal customer proposes to repay a loan out of his monthly salary, a banker should make the following checks:

* If the customer has an account with the bank, check that his regular income appears to be consistent with what the customer is claiming it to be. On other words, if the customer claims that his monthly income is £1,500, a check on his account will show whether or not this is true. ,
* Obtain details of the customer’s other regular outgoings and debts, eg.
* Standing orders (e.g. perhaps to repay a loan to a ﬁnance company);
* Direct debits (e.g. personal pension contributions);
* Quarterly, monthly or annual outgoings, such as payments for gas, electricity, telephone charges, rent, rates, car tax and insurance, children’s school fees etc.

An assessment of the customer’s ability to repay might then be attempted as follows:

 k K

Regular income per month x

Outgoings per month

Standing orders y

Other regular payments (average amount per month) y

Estimated living expenses, perhaps obtained from a discussion with the customer y

Surplus to repay loan x- y

Monthly loan repayments z

Difference

If the surplus to repay the loan exceeds the amount of the required loan repayments, the banker would conclude that the customer is quite possibly capable of making the repayments out of his income. If the surplus is less than the amount of the loan repayments, there would of course be very strong doubts about the customer’ ability to repay. “Borderline” cases, where the surplus to repay the loan and the monthly repayments are roughly the same, might require a more careful consideration.

**Ability to repay: business customers**

If a business customer proposes to repay a loan out of the proﬁts and cash revenues from trading, the banker will want evidence that both proﬁts and cash flows are likely to be sufficient. Evidence would be obtainable from:

* A proﬁt are projection, indicating the likely profitability of a new business venture or capital investment, and likely proﬁtability of the business as a whole;
* A cash low projection, indicating the maximum amount of cash needed (for an overdraft) and the timing and amount of eventual cash receipts;
* Information about the past trading record of the business, perhaps from copies of the ﬁnal accounts of the business for the past three years or so. What the business has achieved in the past could be a guide to what it is likely to achieve in the future.

A proﬁt projection must take account of:

* Interest payments to the bank;
* the tax payable on profit
* proposed dividends to company shareholders. If the company intends to pay out most of its proﬁts as dividends, it might have insufficient retained proﬁts to afford the capital repayments on a loan.

A proﬁt projection and a cash flow projection are not the same thing. For the moment, however, you should remember that:

* a company must be proﬁtable if it is to be able to repay a loan as planned;
* the loan repayments are in “cash”; they are not a transfer of profits. However, the company must obtain the cash to repay the loan from its trading proﬁts;
* however, a “hidden” source of cash in addition to proﬁts is *depreciation*. Depreciation is a charge against the proﬁts of the business, but it is not a cash item of expenditure. This means that if a business, say, cams proﬁts of £10,000, after charging depreciation of £8,000, then the net cash receipts of the business operations will (probably) be in the region 0f £18,000

# **UNIT 19: PRINCIPLES OF GOOD LENDING – SECURITY AND THE FIVE Cs**

**Security**

Security is another important consideration in the lending decision. Some bankers, even today, would argue that it is still the most important consideration, although others would disagree. A banker must ask what the bank's position would be if the customer failed to make the repayments as planned. It has already been stressed that a banker should never want to lend money if he thinks that he will probably need to realize the security.

If a banker decides that must be given as a condition of an advance he must establish:

* Whether there is any security available;
* If security is available:
* Can it be valued easily?
* Could it be sold off fairly easily, should the need arise?
* Is it an asset which has a stable value, a ﬂuctuating value (e.g. stocks and shares) or a value that tends to increase over time (e.g. property)?

If the security has a ﬂuctuating value, the banker must consider the possibility that it might fall in value over the term of the advance. As a general rule, the current value of a security must give a sufficient margin over the amount of the advance to ensure that if the security does subsequently fall in value, the bank’s security is not threatened. **Guarantees and debentures.**

A customer might be asked to give a guarantee, or to provide a guarantee from the third party. In other words, if Mr. A wants to borrow some money from his banking perhaps to help in setting himself up in business, the bank might ask Mr. A for personal guarantee, or alternatively might ask a third party (Mr B or C Ltd) to give their guarantee. A guarantee is of itself merely a personal undertaking by the guarantor. If he defaults, the bank could sue him to enforce his obligation to pay. The guarantee is of little value if the guarantor has no substantial assets or if he becomes bankrupt owing large amounts to other creditors. The bank will therefore try to improve the value of personal guarantee by obtaining a charge, i.e. a priority claim over any substantial assets which the guarantor may have. This is usually done by deposit of title deeds, share certiﬁcates etc. to create an equitable mortgage in favour on the bank. There are two alternative types of arrangement:

* *Third party mortgage* over the guarantor’s property without any personal covenant of guarantee. Eg. X merely deposits securities in support of Y’s liability to the bank. The bank can realize the security but it cannot also sue X since he has no personal obligation;
* *Personal guarantee and a direct mortgage* of property to the bank (e.g. the borrower’s home). The bank can then both sue him on his guarantee and realize the security which he has given.

A company might give a debenture to the bank. If the debenture were given security for an overdraft, it would be for a fluctuating advance at a variable interest rate. The company would charge as security all its undertaking and property, present and future: would give

* a ﬁxed charge on the undertaking and property;
* a ﬁxed charge on any property speciﬁed in a schedule (list) attached to the debenture agreement;
* possibly also a legal mortgage on certain property;
* a ﬂoating charge on all the other aspects of the business.

**Understanding the Five Cs of Credit**

The [five-Cs-of-credit method](https://www.investopedia.com/ask/answers/040115/what-most-important-c-five-cs-credit.asp) of evaluating a borrower incorporates both [qualitative](https://www.investopedia.com/terms/q/qualitativeanalysis.asp) and [quantitative](https://www.investopedia.com/terms/q/quantitativeanalysis.asp) measures. Lenders may look at a borrower's credit reports, credit scores, income statements, and other documents relevant to the borrower's financial situation. They also consider information about the loan itself.

Each lender has its own method for analyzing a borrower's creditworthiness, but the use of the five Cs—character, capacity, capital, collateral, and conditions—is common for both individual and business credit applications.

**1. Character**

Although it's called character, the first C more specifically refers to [credit history](https://www.investopedia.com/terms/c/credit-history.asp): a borrower's reputation or track record for repaying debts. This information appears on the borrower's [credit reports](https://www.investopedia.com/terms/c/creditreport.asp). These credit reports contain detailed information about how much an applicant has borrowed in the past and whether they have repaid loans on time. These reports also contain information on collection accounts and bankruptcies, and they retain most information for seven to 10 years.

Information from these reports helps lenders evaluate the borrower's [credit risk](https://www.investopedia.com/terms/c/creditrisk.asp). For example,

**2. Capacity**

Capacity measures the borrower's ability to repay a loan by comparing income against [recurring debts](https://www.investopedia.com/terms/r/recurring_debt.asp) and assessing the borrower's [debt-to-income (DTI)](https://www.investopedia.com/terms/d/dti.asp) ratio. Lenders calculate DTI by adding together a borrower's total monthly debt payments and dividing that by the borrower's gross monthly income. The lower an applicant's DTI, the better the chance of qualifying for a new loan. Every lender is different, but many lenders prefer an applicant's DTI to be around 35% or less before approving an application for new financing.

 In addition to examining income, lenders look at the length of time an applicant has been employed at their current job and future job stability.

**3. Capital**

Lenders also consider any capital the borrower puts toward a potential investment. A large contribution by the borrower decreases the chance of default. Borrowers who can put a down payment on a home, for example, typically find it easier to receive a mortgage.

**4. Collateral**

[Collateral](https://www.investopedia.com/terms/c/collateral.asp) can help a borrower secure loans. It gives the lender the assurance that if the borrower defaults on the loan, the lender can get something back by repossessing the collateral. Often, the collateral is the object one is borrowing the money for: Auto loans, for instance, are secured by cars, and mortgages are secured by homes.

For this reason, collateral-backed loans are sometimes referred to as [secured](https://www.investopedia.com/terms/s/secureddebt.asp) loans or secured debt. They are generally considered to be less risky for lenders to issue. As a result, loans that are secured by some form of collateral are commonly offered with lower interest rates and better terms compared to other unsecured forms of financing.

**5. Conditions**

The conditions of the loan, such as its interest rate and amount of principal, influence the lender's desire to finance the borrower. Conditions can refer to how a borrower intends to use the money. Consider a borrower who applies for a car loan or a home improvement loan. A lender may be more likely to approve those loans because of their specific purpose, rather than a [signature loan](https://www.investopedia.com/terms/s/signature_loan.asp), which could be used for anything. Additionally, lenders may consider conditions that are outside of the borrower's control, such as the state of the economy, industry trends, or pending legislative changes.

Understanding the Five Cs is critical to your ability to access credit and do it at the lowest cost. Delinquency in just one area can dramatically affect the credit you get offered. If you find that you are denied access to credit or only offered it at exorbitant rates, you can use your knowledge of the Five Cs to do something about it. Work on improving your credit score, save up for a larger down payment, or pay off some of your outstanding debt.

**The role of the banker’s judgment in the lending decision**

We have now looked at a variety of consideration which a banker should assess when making his decision about whether or not to advance -the money asked for by a customer. In many cases, the “yes” or “no” decision ‘might be clear-cut, because the proportion either passes or Fails to conform to the principles of good lending. There will also be many cases where the issue is not so clear, because the customer’s proposition doesn’t conform exactly to the principles of good lending. It is in situations that the banker’s judgment is needed. If every “dubious” proposition were turned down, banks would nun out of people to lend money to. But if too many bad propositions are accepted, the bad debts of the banks might become insupportable.

**Bank policy and lending decision**

Lending decision might also be inﬂuenced by bank policy, so that a banker might agree to make an advance (or refuse an advance) because his bank has adopted a particular policy towards lending, when at other times his decision might have been different. Examples of such bank policies might be:

* a policy in favour of mortgage lending for house purchases be person?»- customers;
* a policy in favour of allowing overdrafts to university and college students.

**The consequences of not Lending**

If a banker decides to turn down a loan request, he must consider the consequences. A ﬂat refusal to lend money might create such bad that the customer decides to take his account to another bank. In some cases, this might not worry the banker unduly; however, as a general rule, it is bad commercial practice to upset customers, because even if a particular lending proposition is being turn down, the customer will still provide valued business for the bank.

The banker must therefore refuse the customer’s request with great tact. In particular:

* the reason For the refusal should be explained. The banker will have a good reason, and if this is properly explained, the customer might see the bank’s point of view.
* if appropriate to the circumstances, the banker should explain to the customer what he would have to do before the bank reconsidered its decision and agreed to give him an advance if the advance if re because the customer’s outgoings exceed his income, the banker must try to show him that drastic action might be needed to put his financial affairs in order.
* if a personal customer in spending above his income, the banker could help him to prepare a budget of his monthly or weekly income and expenditure. This would indicate the extent of the problem, and show by how much the customer must cut back on his spending. The banker might be able to suggest particular ways of saving money. The consequences of not cutting his expenditure might also need to be explained although the banker must still try to avoid causing unnecessary offence. These consequences would include:
* Refusing to honour’ cheques drawn by the customer;
* If the customer has a credit card from the 'bank’s company, informing the company of the customer’s situation, perhaps with a view to withdrawing the card.

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# **UNIT 20 MANAGING MARKET RISK**

**What is market risk?**

It is the risk that the value of on and off-balance sheet positions of a ﬁnancial institution will be adversely affected by movements in market rates or prices such as interest rates, foreign exchange rates, equity prices, credit spreads and/or commodity prices resulting in a loss to earnings and capital.

Financial institutions may be exposed to Market Risk in variety of ways. Market risk exposure may be explicit in portfolios of securities / equities and instruments that are actively traded. Conversely it may be implicit such as interest rate risk due to mismatch of loans and deposits. Besides, market risk may also arise ’rom activities categorized as oft’—balance sheet item. Therefore, market risk is potential for loss resulting from adverse movement in market risk factors such as interest rates, foreign exchange rates, and equity and commodity prices.

There are three types of market risk:

1. Foreign exchange risk
2. Interest rate risk
3. Equity price risk
4. **Foreign Exchange Risk**

It is the current or prospective risk to earnings and capital arising from adverse movements in currency exchange rates. It refers to the impact adverse movement in currency exchange rates on’ the value of open foreign currency position. The banks are also exposed to interest rate risk, which arises from the maturity mismatching of foreign currency positions. Even in cases when spot and forward positions in individual currencies are balanced, the maturity pattern of forward transactions may produce mismatches. As a result, banks may suffer losses due to changes in discounts of the currencies concerned.

In the foreign exchange business, banks also face the risk of default of the counterparties or settlement risk.

**Types of Foreign Exchange Exposure**

The foreign exchange risk exposure of banks is normally broken down into three types:

1. Transaction exposure
2. Translation (accounting) exposure
3. Economic exposure
4. **Transaction exposure**

It is the degree to which the value of future cash transactions can be: affected by exchange rate fluctuations. It relates to the gains and losses to be made when settlement takes place at some future date of a foreign currency denominated contract that has already been entered into.

**Techniques of managing (hedging) transaction exposure**

The following are the methods/techniques of hedging a currency transaction exposure. Internal Techniques

1. **Invoicing in home currency**

A bank or firm to hedge foreign exchange risk will ‘want to do business with foreign entities in home currency so as not make losses in case of unfavorable exchange rate fluctuations. A se1ler’s (receiver of forex) ideal currency, in order of preference, is

1. Home currency
2. Currency stable relative to home currency
3. Market leader’s currency
4. Currency with a good forward market

A seller may also have a healthy interest in a foreign currency in which there is deﬁnitely, or likely, to be future expenditure.

A buyer’s ideal currency is:

1. Own currency
2. Currency stable relative to own currency
3. Currency other suppliers sell in (for convenience and the ease of justifying a purchase)
4. **Leading and lagging**

Leading’ and ‘Lagging’ are terms relating to the "speed of settlement of debts. Leading refers to an immediate payment or the granting of very short term credit. This is beneﬁcial to a payer whose currency (used to settle) is weakening against the payee’s currency. Lagging refers to granting (or taking) of long-term credit.

1. **Multilateral netting and matching**

Matching involves the use of receipts in particular currency to meet payment obligations in the same currency. Netting- involves offsetting the group‘s debtors and creditors in the same currency and only covering the net position. This reduces the amount to be hedged by the group. For example, there is no point in one subsidiary hedging a $1 million debt receivable 2‘: same time as another subsidiary is hedging a $ 1 million debt payable a

**2. External Techniques**

1. **Forward contracts**

Hedging foreign receivable

It concerns the exporters when fear a possible depreciation of the foreign currency up on exchanging the foreign currency for domestic currency ﬂedging foreign receivables involves selling the foreign currency Forward, this means ﬁxing the rate at which the foreign currency will be exchange in the future. Speciﬁcally the ‘process involves the following steps: Sell the foreign currency amount forward at the forward rate/ enter forward contract. Receive the foreign currency amount from the customer; deliver the amount to the bank in exchange for domestic currency.

Hedging foreign payables

Importers would hedge foreign payable when they fear a possible appreciation of the foreign currency. It involves the purchasing of foreign currency forward. This means ﬁxing the exchange rate at which the customer will purchase the foreign currency specially the process involves: Purchase the foreign currency amount forward at a forward rate. When the payment falls due deliver domestic currency amount to the bank, in exchange or foreign currency amount and pay the supplies.

1. Money market hedges

 Hedging receivables

When the exposure arises from future income receivable in foreign currency, a hedge can be created by fixing the value of that income now in domestic currency. In other word, we need to fix the effective exchange value of the future currency income.

Ways of doing this is as follows:

Borrow now in the foreign currency. The term of the loan should be from now until the currency income is receivable. Ideally, borrow just enough money so that the loan plus interest repayable when the loan matures equals the future income receivable in the currency. In this way, the currency income will pay off the loan plus interest, so that the currency income and currency payment match each other. Exchange the borrowed currency immediately into domestic currency at the spot rate. The domestic currency can either be used immediately or put on deposit to earn interest. Either way, the value of the future income in domestic currency is fixed.

A similar approach can be taken to create a money market hedge when there is an exposure to a future payment in a foreign currency. In this situation, a hedge can be created by exchanging domestic currency for foreign currency new (spot) and putting the currency or1 deposit until the future payment has to be made. The amount borrowed plus the interest earned in the deposit period should be exactly enough to make the currency payment when it falls due.

Speciﬁcally it involves the Following steps:

Determine present value of the foreign currency to be paid (using foreign currency interest rate a discount rate). Borrow equivalent amount of home currency (considering spot exchange rate). Convert the home currency into PV equivalent of foreign currency (in spot market now) and make a foreign currency deposit. On payment day, withdraw the foreign currency deposit (which by the time equals the payable amount) and make payment. The cash flows are ﬁxed because the cost in domestic currency is the cost of buying foreign currency spot to put on deposit. The last three techniques of hedging transaction exposure listed below have been tackled extensively in earlier units.

1. Currency futures
2. Currency options
3. Currency swaps
4. **Translation (accounting) exposure**

Translation (accounting) exposure arises from the need to, for purposes of reporting and consolidation, to convert the financial statements of foreign ' operations from the local currency (LC) involved to the home currency (HC). If exchange rates have changed since the previous reporting period, this translation, or restatement, of those assets, liabilities, revenues, expenses, gains and losses that are denominated in foreign currencies will result in foreign exchange gains or losses.

1. Economic exposure

Economic Exposure relates to the possibility that the value of the company (the Present Value of all future cash flows) will change due to unexpected changes in future exchange rates. Its magnitude is difficult to measure as it considers unexpected changes in exchange rates. Even purely domestic ﬁrms may be affected by economic exposure if there is foreign competition within the local markets. Economic exposure is also known as operating, competitive and strategic exposure. The reason is because operating exposure reflects the economic consequences that changes in exchange rate may have on the operating income of the firm and must deal with both strategic and competitive responses to these unexpected changes.

1. **Interest rate risk**

Interest rate risk arises when there is a mismatch between positions, which are subject to interest rate adjustment within a speciﬁed period. The bank's lending, funding and investment activities give rise to interest rate risk. The .immediate impact of variation‘ in interest rate is on bank’s net interest income, while a long term impact is on bank’s net worth since the economic value of bank’s assets, liabilities and off-balance sheet exposures are affected. Consequentially there are the common perspectives for the assessment of interest rate risk:

1. Earning perspective: In earning perspective, the focus of analysis is the impact of variation in interest rates on accrual or reported earnings. This is a traditional approach to interest rate risk assessment and obtained by measuring the changes it the Net Interest Income (N11) or Net Interest Margin (NIM) i.e. the difference between the total interest income and the total interest expense.
2. Economic Value perspective: It reflects the impact of fluctuation in the interest rates on economic value of a financial institution. Economic value of the bank can be viewed as the present value of future cash flows. In this respect economic value is affected both by changes in future cash flows and discount rate used for determining present value. Economic value perspective considers the potential longer-term impact of interest rates on an institution.

**Sources of interest rate risks:**

Interest rate risk occurs due to (1) differences between the timing of rate changes and the timing of cash ﬂows (re-pricing risk); (2) changing rate relationships among different yield curves effecting bank activities (basis risk); (3) changing rate relationships across the range of maturities (yield curve risk); and ‘(4) interest- related optic ns embedded in bank products (options risk). '

1. **Equity price risk**

It is risk to earnings or capital that results from adverse changes in the value of equity related portfolios of a ﬁnancial institution. Price risk associated with equities could be systematic or unsystematic. The former refers to sensitivity of portfolio’s value to changes in overall level of equity prices, while the latter is associated with price volatility that is determined by ﬁrm speciﬁc characteristics.

**UNIT 21: ELEMENTS OF MARKET RISK MANAGEMENT IN FINANCIAL INSTITUTIONS (BANKS)**

 The elements of market risk management in a bank include: Board and senior management oversight, organization structure, market risk measurement, risk monitoring and risk control.

**Board and senior Management Oversight**

Likewise other risks, the concern for management of Market risk must start from the top management. Effective board and senior management oversight of the bank’s overall market risk exposure is cornerstone of risk management process. For its part, the board of directors has following responsibilities:

1. Delineate banks overall risk tolerance in relation to market risk.
2. Ensure that bank’s overall market risk exposure is maintained at prudent lever» and consistent with the available capital.
3. Ensure that top management as well as individuals responsible for market risk management possess sound expertise and knowledge to accomplish the risk management function.
4. Ensure that the bank implements sound fundamental principles that facilitate the identiﬁcation, measurement, monitoring and control of market risk.
5. Ensure that adequate resources (technical as well as human) are devoted market risk management.

While the board gives a strategic direction and goals, it is the responsibility of management to transform those directions into procedural guidelines and xxxxx document and ensure proper implementation of those policies. Accordingly, xxxxx management is responsible to:

1. Develop and implement procedures that translate business policy and strategic direction set by BOD into operating standards that are well understood by bank’s personnel.
2. Ensure adherence to the lines of authority and responsibility that board has established for measuring, managing, and reporting market risk.
3. Oversee the implementation and maintenance of Management Information System that identify, measure, monitor, and control banks market risk.
4. Establish effective internal controls to monitor and control market risk.

**Organizational Structure**

The organizational structure used to manage market risk vary depending upon the nature size and scope of business activities of the institution, however, any structure does not absolve the directors of their ﬁduciary responsibilities of ensuring safety and soundness of institution. While the structure varies depending upon the size, scope and complexity of business, at a minimum it should take into account following aspects:

1. The structure should’ conform to the overall strategy and risk policy set by the BOD.
2. Those who take risk (front office) muss know the organization’s risk profile, products that they are allowed to trade, and the approved limits.
3. The risk management function should be, independent, reporting directly to senior management or BOD.
4. The structure should be reinforced by a strong MIS for controlling, monitor and reporting market risk, including transactions between an institution and its afﬁliates. Besides tie role of Board as discussed earlier, a typical organization set up for Market Risk Management should include:

-The Risk Management Committee;

- The Asset-Liability Management Committee (ALCO);

- The Middle Ofﬁce,

**Risk Management Committee:** It is generally a board level subcommittee constituted to supervise overall risk management functions of the bank. The structure of the committee may vary in banks depending upon the size and volume of the business. Generally it could include heads of Credit, Market and operational risk Management Committees. It will decide the policy and strategy for integrated risk management containing various risk exposures of the bank including the market risk. The responsibilities of Risk Management Committee with regard to market risk management aspects include:

1. Devise policies and guidelines for identification, measurement, monitoring and control for all major risk categories.
2. The committee also ensures that resources allocated for risk management are adequate given the size nature and volume of the business and the managers and staff that take, monitor and control risk possess sufficient knowledge and expertise.
3. The bank has clear, comprehensive and well—documented policies and procedural guidelines relating to risk management and the relevant staff fully understands those policies.
4. Reviewing and approving market risk limits, including triggers or stop losses for traded and accrual portfolios.
5. Ensuring robustness of ﬁnancial models, and the effectiveness of allsystem.-2 used to calculate market risk.
6. The bank has robust Management information system relating to risk reporting.

**Asset-Liability Committee**

Popularly known as ALCO, is senior management level committee responsible for supervision / management of Market Risk (mainly interest rate and Liquidity risks). The committee generally comprises of senior managers from treasury, Chief

Financial Officer, business heads generating and using the funds of the bank, credit, and individuals from the departments having direct link with interest rate and liquidity risks. The CEO or some senior person nominated by CEO should be head of the committee. The size as well as composition of ALCO could depend on the size of each institution, business mix and organizational complexity. To be effective ALCO should have members from each are; of the bank that significantly inﬂuences liquidity risk. In addition, the head of the information system Department (if any) may be an invitee for building up of MIS and related computerization. Major responsibilities of the committee include:

1. To keep an eye on the structure /composition of bank’s assets and liabilities and decide about product pricing for deposits and advances.
2. Decide on required maturity profile and mix of incremental assets and liabilities.
3. Articulate interest rate view of the bank and deciding on the future business strategy.
4. Review and articulate ﬁnding policy.
5. Decide the transfer pricing policy of the bank.
6. Evaluate market risk involved in launching of new products.

**Middle Office**

The risk management functions relating to treasury operations are mainly performed by middle office. The concept of middle office has recently been introduced so as to independently monitor measure and analyse risks inherent in treasury operations of banks. Besides, the unit also prepares reports for the information of senior management as well as bank’s ALCO. Basically the middle ofﬁce performs risk review function of day-to-day activities. Being at highly specialized function, it should be staffed by people who have relevant expertise and knowledge.

**UNIT 22: MARKET RISK MEASUREMENT, MONITORING AND CONTROL**

**Risk measurement**

Accurate and timely measurement of market risk is necessary for proper risk management and control. Market risk Factors that affect the value of traded portfolios and the income stream or value of non-traded portfolio and other business activities should be identiﬁed and quantiﬁed using data that can be directly observed in markets or implied from observation or history. While there is a wide range of risks, measurement techniques ranging from static measurement techniques (Gap analysis) to highly sophisticated dynamic modeling (Monte Carlo Simulation), the banks may employ any technique depending upon the nature, size and complexity of the business and most important the availability and integrity of data. Banks may adopt multiple risk measurement methodologies to capture market risk in various business activities; however management should have an integrated view of overall market risk across products and business lines. The measurement system ideally should:

1. Assess all material risk factors associated with a bank's assets, liabilities, and of!’ Balance sheet positions.
2. Utilize generally accepted ﬁnancial concepts and risk measurement techniques.
3. Have well documented assumptions and parameters. It is important that the assumptions underlying the system are clearly understood by risk managers and top management.

**Repricing Gap Models**

At the most basic level banks may use repricing gap schedules to measure their interest rate risk. A gap report is It static model wherein interest sensitive assets (ISA), Interest sensitive liabilities (ISL) and off-balance sheet items bro stratiﬁed into various time bands according to their maturity (if ﬁxed rate) or time remaining to their next re-pricing (If floating rate). The size of the gap for a given time band - that is, assets minus liabilities plus OBS exposures that re-price or mature within that time hand gives an indication of the bank's re-pricing risk exposure. It ISA of a bank exceed ISL in a certain time band, the bank is said to have a positive GAP for that particular period and vice versa. An interest sensitive gap ratio is also a good indicator of bank’s interest rate risk exposure.

**Relative Interest Sensitive GAP** = Interest Sensitive GAP /Bank’s Total Asset Also an ISA to ISL ratio of bank for particular time band could be it useful estimation of a bank’s position.

Interest Sensitive Ratio = Interest Sensitive Asset/ Interest Sensitive Liabilities **Measuring Risk to Net Interest Income (NII)**

Gap schedules can provide an estimate of changes in bank’s net interest, income given changes in interest rates. The gap for particular time band could be multiplied by a hypothetical ' change in interest rate to obtain an approximate change in net interest income. The formula to translate gaps into the amount of the interest income at risk, measuring exposure over several periods, is:

**(Periodic gap) x (change in rate) x (time over which the periodic gap is in effect) = change in NII**

While sum GAP measurement apparently seen perfect, practically there are some problems such as interest paid on liabilities 01' a bank which are generally short term tend to move quickly compared with that "being earned on assets many which are relatively longer term. This problem can be minimized by assigning weights to various ISA and ISL that take into account the tendency of the bank interest rates to vary in speed and magnitude relative to each other and with the up and down business cycle.

**Measure of risk to Economic Value**

The stratification of Assets and liabilities into various time bands in a gap analyses can also be extended to measure change in economic value of banks assets due to change in interest rates. This can be accomplished by applying sensitivity weights to each time band. Typically, such weights are based one estimates of the duration of the assets and liabilities that tall into each time band, where duration is a measure of the percentage change in the economic value of a position that will occur given a small change in the level cl’ interest rates. Duration-based weights can be used in combination with a maturity/ re-pricing schedule to provide a rough approximation of the change in a bank's economic value that could occur given a particular set of changes in market interest rates.

**Earnings at Risk and Economic Value of Equity Models**

Many bank, especially those using complex ﬁnancial instruments or otherwise having complex risk proﬁles, ‘employ more sophisticated interest rate risk measurement systems than those used on simple maturity/re-pricing schedules. These simulation techniques attempt to overcome the limitation of static gap schedules and typically involve detailed assessments of the potential effects of changes in interest rates on earnings or economic Value by simulating the future path of interest rates and their impact on cash flows. In static simulations, the cash flows arising solely from the bank's current on- and off balance sheet positions are assessed. In a dynamic simulation approach, the simulation builds in more detailed assumptions about the future course of interest rates and expected changes in a bank’s business activity over that time. These more sophisticated techniques allow for dynamic interaction of payments streams and interest rates, and better capture the effect of embedded or explicit options.

**Value at Risk**

Value at Risk (VAR) is generally accepted and widely used tool for measuring market risk inherent in trading portfolios. It follows the concept that reason able expectation of loss cam be deduced by evaluating market rates, prices observed volatility and correlation. VAR summarizes the predicted maximum loss (or worst less) over a target horizon within a given confidence level. The well- known proprietary models that use VAR approaches are JP Morgan’s, Risk metrics, Banker’s trust Risk Adjusted Return on Capital, and Chase’s Value at risk. Generally there are three ways of computing VAR.

* Parametric method or Variance covariance approach
* Historical Simulation
* Monte Carlo method

**Risk Monitoring**

Risk monitoring processes are established to evaluate the performance of bank’s risk strategies/policies and procedures in achieving overall goals. Whether the monitoring function is performed by middle-office or it is a part of banks internal audit it is important that the monitoring function should be independent of units taking risk and report directly to the top management/board.

**Risk Control**

Bank’s internal control structure ensures the effectiveness of process relating to market risk management. Establishing and maintaining an effective system of controls including the enforcement of ofﬁcial lines of authority and appropriate segregation of duties, is one, of the management moat important responsibilities. Persons responsible for risk monitoring and control procedures should be independent of the functions they review. Key elements of Internal control process include internal audit and review and an effective risk limit structure.

**Audit**

Banks need to review and validate each step of market risk in measurement process. This review function can be performed by a number of units in the organization including internal audit/control department or ALCC) support staff small banks external auditors or consultants can perform the function.

**Risk limits**

As stated earlier it is the board that has to determine bank’s overall risk appetite and exposure limit in relation to its market risk strategy. Based on these tolerances the senior management should establish appropriate risk limits. Risk limits for business units, should be compatible with the institution's strategies, risk management systems and risk tolerance. The limits should be approved and periodically reviewed by the Board of Directors and/or senior management, with changes in market Conditions or resources prompting a reassessment of limits institution need to ensure consistency between the different types of limits.

1. Gap Limits: The gap limits expressed in terms of interest sensitive ratio for a given time band aims at managing potential exposure to a bank’s earnings / capit2'=7 due to changes in interest rates. Setting such limits is useful way to limit the volume of a bank’s repricing exposures and is an adequate and effective method of communicating the risk proﬁle of the bank to senior management such gap limits can be set on a net notional basis (net of asset / liability amounts for both on and off’. balance sheet items) or a duration-weighted basis, in each time lf and duration the weighted average term to maturity of a security’s cash flow
2. Factor Sensitivity Limits: The factor sensitivity of interest rate position calculated by discounting the position using current market interest rate and the using the current market interest rate increase or decrease by one basis point.

**UNIT 23: MANAGING LIQUIDITY RISK**

What is liquidity risk?

Liquidity risk is the potential for loss to an institution arising from either its inability 1) meet its obligations or to fund increases in assets as they fall due without incurring unacceptable cost or losses.

Liquidity risk is considered a major risk for banks. It arises when the cushion provided by the liquid assets are not sufficient enough to meet it: obligation. In such a situation banks often meet their liquidity requirements from market. However conditions of funding through market depend upon liquidity in the market and borrowing institution's liquidity. Accordingly an institution short of liquidity may have to undertake transaction at heavy cost resulting in a loss of earning or in worst case scenario the liquidity risk could result in bankruptcy of the institution if it is unable to undertake transaction even at current market prices.

Banks with large off-balance sheet exposures or the banks, which rely heavily on large corporate deposit, have relatively high level of liquidity risk. Furth. The banks experiencing a rapid growth in assets should have major concern for liquidity.

Liquidity risk may not be seen in isolation, because ﬁnancial risks are not mutually exclusive and liquidity risk often triggered by consequence of these other financial risks sued as credit risk, market risk etc. For instance, a bank increasing its credit risk through asset concentration etc may be increasing its liquidity risk as well.

Similarly a large loan default or changes in interest rate can adversely impact a bank’s liquidity position. Further" if management misjudges the impact on liquidity of entering into a new business or product line, the bank’s strategic risk would increase.

**Early Warning indicators of liquidity risk**

An incipient liquidity ‘problem may initially reveal in the bank's ﬁnancial monitoring system as a downward trend with potential long’-term consequences for, earnings or capital. Given below are some early warning indicators that not necessarily always lead to liquidity problem for a bank; however these have potential to ignite such a problem. Consequently management needs to watch carefully such indicators and exercise further scrutiny/analysis wherever it deems appropriate. Examples of such internal indicators are:

1. A negative trend or signiﬁcantly increased risk in any area or product line.
2. Concentrations in either assets or liabilities.
3. Deterioration in quality of credit portfolio.
4. A decline in earnings performance or projections.
5. Rapid asset growth funded by volatile large deposit.
6. A large size of off-balance sheet exposure.
7. Deteriorating third party evaluation about the bank

A liquidity risk management involves not only analyzing banks on and off- balance sheet positions to forecast future cash ﬂows but’ also how the funding requirement would be met. The later involves identifying the funding market the bank has access,- understanding the nature of those markets, evaluating banks current and future use of the market and monitor signs of conﬁdence erosion.

**Liquidity Risk Strategy**:

The liquidity risk strategy deﬁned by the board of the bank should enunciate speciﬁc policies on particular aspects of liquidity risk management, such as:

1. Composition of Assets and Liabilities, The strategy should outline the-mix of assets and liabilities to maintain liquidity. Liquidity risk management and asset/liability management should be integrated to avoid steep costs associated with having to rapidly reconﬁgure the asset liability profile from maximum proﬁtability to increased liquidity.
2. Diversification and Stability of Liabilities. A funding concentration exists when a single decision or a single factor has the potential to result in a signiﬁcant and sudden withdrawal of funds. Since such a situation could lead to an increased risk, the Board of Directors and senior management should specify guidance relating to funding sources and ensure that the bank have a diversified sources of funding day-to-day liquidity requirements. An institution would be more resilient to tight market liquidity conditions if its liabilities were derived from more stable sources.

To comprehensively analyse the stability of liabilities/funding sources the bank need to identify:

* + Liabilities that would stay with the institution under any circumstances;
	+ Liabilities that run-off gradually if problem: arise; and
	+ That run-off immediately at the first sign of problems.
1. **Access to Inter-bank Market**. The inter-bank market can be important sourer; of liquidity. However, the strategies should take into account the fact that in crisis situations access to inter-bank market could be difficult well as costly.

 **ALCO/Investment Committee**

The responsibility for managing the overall liquidity of the bank should be delegated to a speciﬁc, identiﬁed group within the bank. This might be in the form of an Asset Liability Committee (ALCO) comprised of senior management, the treasury function or the risk management department. It simply means that the, ALCO should comprise of senior management from each key area of the institution

That assumes and/or manages liquidity risk. It is important that these members have clear authority over the units responsible for executing liquidity- related transactions so that ALCO directives reach these one units unimpeded. The ACO should meet monthly, if not on a more frequent basis. Generally responsibilities of ALCO include developing and maintaining appropriate risk management policies -and procedures, MIS reporting, limits, and over sight programs. ALCO usually delegates day-to-day operating responsibilities to the banks treasury department. However, ALCO should establish speciﬁc procedures and limits governing treasury operations before making such delegation. Since liquidity risk management is a technical job requiring specialized knowledge and expertise, it is important that senior management /ALCO not only have relevant expertise but also have a good understanding of the nature and level of liquidity risk assumed by the institution and the means to manage that risk. To ensure that ALCO can control the liquidity risk arising from never products and future business activities, the committee members should interact regularly with the bank's risk managers and strategic planners.

**UNIT 24 LIQUIDITY RISK MANAGEMENT PROCESS**

Key elements of an effective risk management process include an efficient Management Information System (M IS), systems to measure, monitor and control existing as well as future liquidity risks and reporting them to senior management.

**Management Information System**

An effective management information system (M1S) is essential for sound liquidity management decisions. Information should be readily available for day to day liquidity management and risk control, as well 15 during times of stress. Data should be appropriately consolidated, comprehensive yet succinct, focused, and available it: a timely manner. Ideally, the regular reports a bank generates will enable it t) monitor liquidity (luring a crisis; managers would simply have to prepare the reports more frequently. Managers should keep crisis monitoring in mind when developing liquidity MIS.

Management should regularly consider how best to summarize complex or detailed issues for senior management or the board. Besides other types of information important for managing day-to-day activities and for understanding the bank’s inherent liquidity risk proﬁle include

1. Asset quality and its trends.
2. Earning.-ii projections.
3. The bank's general reputation in the market and the condition of the market itself.
4. The type and composition of the overall balance sheet structure.
5. The type of new deposits being obtained, as well as its source, maturity, and price.

**Liquidity Risk Measurement and Monitoring**

An effective measurement and monitoring system is essential I for adequate management of liquidity risk. Consequently banks should institute systems that enable them to capture liquidity risk ahead of time, so that appropriate remedial measures could be prompted to avoid any significant losses. Discussed below are some (but not all) commonly used liquidity measurement and monitoring techniques that may be adopted by the banks:

**Contingency Funding Plans**

In order to develop a comprehensive liquidity risk management framework, institutions should have way out plans for stress scenarios. Such a plane commonly known as Contingency Funding Plan (CFP) is a set of policies and procedures that serves as a blue print for a bank to meet its ﬁnding needs in a timely manner and ma reasonable cost. A CFP is a projection of future cash ﬂows and funding sources of a bank under market scenarios including aggressive asset growth or rapid liability erosion. The scope of the CFP is discussed in more detail below.

**Use of CFP for Routine Liquidity Management**

For day-to—day liquidity risk management integration of liquidity scenario will ensure that the bank is best prepared to respond to an unexpected problem. In this sense, a CFP is an extension of on-going liquidity management and formalizes the objectives of liquidity management by ensuring:

1. A reasonable amount of liquid assets are maintained.
2. Measurement and projection of funding requirements during various scenarios.
3. Management of access to funding sources.

**Cash Flow Projections**

At the basic level banks may utilize flow measures to determine their cash position. A cash flow projection estimates a bank’s inﬂows and outflows and thus net deﬁcit or surplus (GAP) over a time horizon. The contingency funding plan discussed previously is one example of a cash flow projection.

**Liquidity Ratios and Limits**

Banks may use a variety of ratios to quantify liquidity. These ratios can also be used to create limits for liquidity management. However, such ratios would be meaningless; unless used regularly and interpreted taking into account qualitative factors. The following are the ratios and limits used for reducing liquidity risk:

1. **Cash Flow Ratios and Limits.**

One of the most serious sources of liquidity risk comes from a bank's failure to "roll over a maturing liability. Cash flow ratios and limits attempt to measure and control the volume of liabilities maturing during a speciﬁed period of time.

1. **Liability Concentration Ratios and Limits**.

Liability concentration ratios and limits help to prevent a bank from relying on too few providers or funding sources. Limits are usually expressed as either a percentage of liquid assets or an absolute amount. Sometimes they are more indirectly expressed as a percentage of deposits, purchased funds, or total liabilities.

1. **Other Balance Sheet Ratios**.

Total loans/total deposits, total loans/total equity capital, borrowed funds/total assets etc are examples of common ratios used by ﬁnancial institutions to monitor current and potential funding levels. Internal Controls In order to h we effective implementation of policies and procedures, banks should institute review process that should ensure the compliance-of various procedures and limits prescribed by senior management. Persons independent of the funding areas should perform such reviews regularly. The bigger and more complex the bank, the more thorough should be the review.

**Monitoring and Reporting Risk Exposures**

Senior management and the board, or a committee thereof, should receive reports on the level and trend of the bank's liquidity risk at least quarterly. Are cent trend in liquidity monitoring is incremental reporting, which monitors liquidity through a series of basic liquidity reports during stable funding periods but ratchets up both the frequency and detail included in the reports produced during periods of liquidity stress. From these reports, senior management and the board should learn how much liquidity risk the bank is assuming, whether management is complying with risk limits, and whether management strategies are consistent with the board's expressed risk tolerance. The sophistication or detail of the reports should be commensurate with the complexity of the bank.

# **UNIT 25: MANAGING OPERATIONAL RISK**

What is operational risk? Operational risk is the risk of loss resulting from inadequate or failed internal processes, people and system or from external events.

Operational risk is associated with human error, system failures and ‘inadequate procedures and controls. It is the risk of loss arising from the potential that inadequate information system; technology failures, breaches in internal cor‘1trols, fraud, unforeseen catastrophes, or other operational problems may result in unexpected losses or reputation problems. Operational risk exists in all products and business activities. **Types of operational risk**

Operational risk event types that have the potential to resulting substantial losses includes Internal fraud, External fraud, employment practices and work place safety, clients, products and business practices, business disruption and system failures, damage to physical assets, and finally execution, delivery and process management.

The objective of operational risk management is the same as for credit, market and liquidity risks that is to find out the extent of the financial instit1tion’soperationa' risk exposure; to understand what drives it, to allocate capital against it and identify trends internally and externally that would help predicting it. The management speciﬁc operational risks is not a new practice; it has always been important for banks to try to prevent fraud, maintain the integrity of ‘internal controls, and reduce errors in transactions processing, and so on. However, what is relatively new is the view of operational risk management as a comprehensive practice comparable to the management of credit and market risks in principles.

Failure to understand and manage operational risk, which is present in virtually all banking transactions and activities, may greatly increase the likelihood that some risks will go unrecognized and uncontrolled.

**Operational Risk Management Principles**

There are 6 fundamental principles that all institutions, regardless of their size or complexity, should address in their approach to operational risk management.

1. Ultimate accountability for operational risk management rests with the board, and the level ‘of risk that the organization accepts, together with the basis for managing those risks, is driven from the top down by those charged with overall responsibility for running the business,
2. The board and executive management should ensure that there is an effective, integrated operational risk management framework. This should incorporate a clearly defined organizational structure, with defined roles and responsibilities for all aspects of operational risk management/monitoring and appropriate tools that support the identiﬁcation, assessment, control and reporting of key risks.
3. Board and executive management should recognize, understand and have deﬁned all categories of operational risk applicable to the institution. Furthermore, they should ensure that their operational risk management framework adequately covers all of these categories of operational risk, including those that do not readily lend themselves to measurement.
4. Operational risk policies and procedures that clearly define the way in which all aspects of operational risk are managed should be documented and communicated These operational risk management policies and procedures should be aligned to the overall business strategy and should support the continuous improvement of risk management.‘
5. All business and support functions should be an integral part of the overall operational risk management framework in order to enable the institution to manage effectively the key operational risks facing the institution.
6. Line management should establish processes for the identiﬁcation assessment, mitigation, monitoring and reporting of operational risks that are appropriate to the needs of the institution, easy to implement, operate consistently over time and support an organizational View of operational risks and material failures.

**Board and senior management’s oversight**

Likewise other risks, the ultimate responsibility of operational risk management rests with the board of directors. Both the board and senior management should establish an organizational culture that places a high priority on effective operational risk management and adherence to sound operating controls. The board should establish tolerance level and set strategic direction in relation to operational risk. Such a strategy should be based on the requirements and obligation to the stakeholders of the institution. Senior management should transform the strategic direction given by the board through operational risk management policy. Although the Board may delegate the management of this process, i.t must ensure that its requirements are being executed. The policy should include:

1. The strategy given by the board of the bank.
2. The systems and procedures to institute effective operational risk management framework.
3. The structure of operational risk management function and the roles and responsibilities of individuals involved.

The policy should establish a process to ensure that any new or changed activity, such as new products or systems conversions, will be evaluated for operational risk prior to going online. It should be approved by the board and documented. The management should ensure that it is communicated and understood, throughout in the institution. The management also needs to place proper monitoring and control processes in order to have effective implementation of the policy. The policy should be regularly reviewed and updated, to ensure it continue to reflect the environment within which the institution operates.

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# **UNIT 26: OPERATIONAL RISK FUNCTION, ASSESSMENT, QUANTIFICATION, MITIGATION, AND CONTROL**

**Operational Risk Function**

A separate function independent of internal audit should be established for effective management of operational risks in the bank. Such a functional let up would assist management to understand and effectively manage operational risk. The function would assess, monitor and report operational risks as a whole and ensure that the management of operational risk in the bank is carried out as per strategy and policy. To accomplish the task the function would help establish policies and standards and coordinate various risk management activities. Besides, it should also provide guidance relating to various risk management tools, monitors and handle incidents and prepare reports for management and BOD.

**Risk Assessment and Quantiﬁcation**

Banks should identify and assess the operational risk inherent in all material products, activities, processes and systems and its vulnerability to these risks. Banks should also ensure that before new products, activities, processes and systems are introduced or undertaken, the operational risk inherent in there is subject to adequate assessment procedures. While a number of technique are evolving, operating risk remains the most difficult risk category to quantify It would not be feasible at the moment to expect banks to develop such measures. However the banks could systematically track and record frequency, severity and other information on individual loss events. Such a data could provide meaningful information for assessing the bank’s exposure to operational risk and developing a policy to mitigate / control that risk.

**Risk Management and Mitigation of Risks**

Management need to evaluate the adequacy of counter measures, both in terms of their effectiveness in reducing the probability of a given operational risk, and of their effectiveness in reducing the impact should it occur. Where necessary, steps should be taken to design and implement cost-effective solutions to reduce the operational risk to an acceptable level. It is essential that ownership for these actions be assigned to ensure that they are initiated. "Risk management and internal control procedures should be established by the business units, though guidance from the risk ‘function may be required, to address operational risks. While the extent and nature of the controls adopted by each institution will be different, very often such measures encompass areas such as Cone of Conduct, Delegation of authority, Segregation of duties, audit coverage compliance, succession planning, mandatory leave, staff compensation recruitment and training, dealing with customers, complaint handling, record keeping, MIS, physical controls, etc.

**Risk Monitoring**

An effective monitoring process is essential for adequately managing operational risk. Regular monitoring activities can offer the advantage of quickly detecting and correcting deficiencies in the policies, processes and procedure for managing operational risk. Promptly detecting and addressing the: deﬁciencies can substantially reduce the potential frequency and/or severity of loss. There should be regular reporting of pertinent information to semi- management and the board of directors that supports the proactive management of operational risk. Senior Management should establish a Programme to

1. Monitor assessment of the exposure to all types of operational risk faced by the institution;
2. Assess the quality and appropriateness of mitigating actions, including the extent to which identiﬁable risks can be transferred outside the institution; and

**Establishing Control Mechanism**

Although a framework of formal, written policies and procedures is critical, it needs to be reinforced through a strong control culture that promotes sound risk management practices. Banks should have policies, processes and procedures to control or mitigate material operational risks. Banks should assess he feasibility of alternative risk limitation and control strategies and should adjust their operational risk proﬁle using appropriate strategies, in light of their overall risk appetite and proﬁle. To be effective, control activities should be an integral part of the regular activities of a bank. **Contingency planning**

Banks should have in place contingency and business continuity plans to ensure their ability to operate as going concerns and minimizes losses it the event of severe business disruption.

Ensure that adequate controls and systems are in place to identify and address problems before they become major concerns. It is essential that:

1. Responsibility for the monitoring and controlling on operational risk should follow the same type of organizational structure that has been adopted for other risks; including market and credit risk;
2. Senior Management ensure that an agreed deﬁnition of operational risk together with a mechanism for monitoring, assessing and reporting it is designed and implemented; and
3. This mechanism should be appropriate to that scale of risk and activity undertaken.

Operational risk metrics or “Key Risk Indicators” (KRIS) should be established for operational risks to ensure the escalation of significant risk issues to appropriate management levels. KRIS are most easily established during the risk assessment phase. Regular reviews should be carried out by internal audit, or other qualiﬁed parties, to analyse the control environment and test the effectiveness of implemented controls, thereby ensuring business operations are conducted in a controlled manner.

**Risk Reporting**

Management should ensure that information is received by the appropriate people, on a timely basis, in a form and format that will aid in the monitoring and control of the business. The reporting process should include information such as:

* The critical operational risks facing, or potentially facing, the institution;
* Risk events and issues together with intended remedial actions;
* The effectiveness of actions taken;
* Details of plans ‘formulated to address any exposures where appropriate;
* Areas of stress where crystallization of operational risks is imminent; and
* The status of steps taken to address operational risk.

**READING MATERIALS**

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