Credit Risk Analysis

 $\ensuremath{\mathcal{A}}$ Tryst with Strategic $\ensuremath{\mathcal{P}}$ rudence

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A Tryst with Strategic Prudence

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This book is dedicated to my daughter, Angela

Preface

The aim of the book is to present a reasonably rigorous treatment of credit risk in a way that would be accessible both to students and professionals involved in credit risk management. The book can act as a reference book for practitioners in credit and students who have finance as one of their major topics. The reader is provided with several tools that will enhance analytical skills to be applied to various situations and problems. Gone are the days where 'big names' acted as the litmus test of credit risk. There are cases where many credit decision takers, even at the top level innocently assume 'equity risk' as credit risk, which ultimately lead to avoidable credit losses. The book emphasizes the true nature of credit risk and would enable avoidance of such situations.

Part I introduces the reader to the meaning and other fundamentals of credit. Merits and the demerits of credit, importance of credit and precautions of using credit have been discussed. The role of Credit Risk Management in the overall context of an organization has been discussed. Part II deals with Firm Credit Risk through EIIF (External Risk, Industry Risk, Internal Risk and Financial Risk) Model. The EIIF Model is one of the unique features of this book. Part III contains unique credit risks of two common situations, Project Finance and Working Capital Finance. Part IV covers Credit Portfolio Construction, Portfolio Level Credit Risks and Mitigation Tools among others. It also shows how the core fundamentals of Markowitz Portfolio Selection principles can be adapted for credit portfolio management. Part V describes How to Price Credit Risk and Part VI discusses the Relevance of Security and covers main topics such as Essentials of Good Security, Role of Security and Types of Security.

My special thanks to Jeff Peanick and Srinivasan, who encouraged me to look at the credit risk from a lateral angle as well. Besides, during my tryst with credit risk exceeding a decade, I have been fortunate to have dealt with some of the most complicated credit risks in India and abroad, without which this book would not have been possible. My sincere thanks to Christopher, Dr. (Prof) Stephen Mathews and Ali Al Abkari for their useful suggestions and Deepa Varadarajan of Tata McGraw-Hill for her inspirational guidance. While the views expressed herein are the result of lot of experience, effort, thoughts and interest in the topic, with humility,I seek suggestions to improve the contents of the book, from my esteemed readers.

> CIBY JOSEPH October 2005

Author's Profile



Ciby Joseph, a Fellow Member of Institute of Chartered Accountants of India with expertise in corporate credit analysis and corporate finance exceeding a decade, has handled diverse credit risk assignments both in India and abroad. A university rank holder, his professional interests cover a variety of areas including project evaluation, business valuation, financial modelling, risk management, credit rating and credit operations. Mr. Joseph currently heads Financial Analysis Unit in Credit Risk Management of HSBC Middle East Bank Ltd. in Dubai, United Arab Emirates.

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Basics of Credit Risk

PART ONE



Introduction To Credit

Credit, nowadays, is pervasive and is a common feature of all global economies. The only place where it is probably absent is among tribes still living in deep jungles.

Look around, observe your newspapers, magazines, television or radio or the billboards on highways—everywhere you can see invitations to participate in credit schemes. Manufacturers of automobile and consumer durables offer credit directly or through their finance subsidiaries or offer instalment schemes on easy repayment terms. Credit card issuers attempt to persuade almost everybody to live on credit, and at least some credit card holders find themselves living beyond their means and almost in perpetual credit.

Individuals borrow to fulfil immediate physical needs such as house, furniture, car or consumer durables or to meet consumption expenditure for things as varied as marriage, education or holidays. Businesses borrow to facilitate expansion or to meet working capital requirements, among other things. Governments borrow to keep themselves afloat and hope to repay loans from future tax revenues or further loans. Central governments and big businesses borrow from abroad, and these debts, if not managed properly, can plunge the debtor country into a foreign exchange crisis. Examples are the 2002 Argentina Crisis or the 1997 Far East Asian Crisis.

1.1 MEANING OF CREDIT

The concept of credit has existed from the early days of civilization. Nowadays credit implies monetary or monetary-equivalent transactions. It also includes non-monetary and/or barter transactions. Roughly, we can define credit as "A transaction between two

parties in which one (the creditor or lender) supplies money or monetary equivalent goods, services, etc., in return for a promise of future payment by the other (the debtor or borrower). Such transactions normally include the payment of interest to the lender."

The second part of this definition is interesting—it shows that credit is not cost-free. The creditor parts with the resources because he has the incentive—either directly or indirectly. The incentive is required because the lender has opportunity cost—he could have deployed the resources elsewhere gainfully. Accordingly, for the sacrifice of this opportunity, the lender expects a return, which is normally known as interest. Down the ages, how much a lender can charge as interest has always been under dispute, prompting certain segments of society to view interest as an evil. However, it is an undeniable fact that interest is a type of cost of capital, charged by lenders. While excessive or imprudent borrowings can be catastrophic, cost of capital cannot be blamed for the imprudence.

Of course, interest rates that do not justify the underlying economic realities and result in deprival of economic assets of the borrower are exploitation—a strategy followed by big powers. The East India Company ensured the dependency of some its vassal states in India by lending them large sums of money at exorbitant interest rates. The book *The Honourable Company* by John Keay, talks of loans given by the East India Company to the Nawab of Arcot at exorbitant interest rates of 20% to 25%. This ensured not only the indebtedness of Nawab to the Company but also channelled the revenues of the Carnatic into the Company's pockets without any hassle.

The borrower is responsible for the borrowings he makes and he should face the consequences, even if he loses his shirt ultimately. So the caveat is 'Let the borrower be aware'.

1.2 CREDIT LOSS

Naturally, some debtors do not pay back the credit as promised, creating a credit loss, sometimes even making the creditor bankrupt. But the majority of the debtors meet their commitments. That is why the world economy survives. Credit losses or bad debts occur in both finance and non-finance businesses. The reasons vary. In certain cases, if credit is extended to crooks, it is bad debt from inception. However, the bulk of credit losses happen because of genuine business failures. The reasons vary from increase in competition, new technology, substitutes, increase in prices, decline in demand, overestimation of demand, oversupply position in the market, government regulations, union problems, mismanagement, death of key persons, business cycles, overambitious projects, financial losses, excessive leverage, concentrated exposure,

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defective diversification and so on. A proper credit-risk analysis will bring to light the probability of credit loss arising out of genuine business factors.

There are situations where the creditor ends up losing even if the debtor settles the dues on time. One cause is inflation. If the rate of inflation exceeds the interest rates, the suppliers of credit are badly affected. In such situations, the inflation actually redistributes money from lenders to borrowers. If the interest rates are 10% and the inflation is 20%, the saver will lose 10% of the real value of the savings. However, banks and other financial intermediaries do not lose much in an inflationary situation because they in turn pass on the reduction in purchasing power to depositors. Moreover, the central bank of any economy may increase the interest rates, to bring down the inflationary pressure by dampening the credit off-take.

Another cause could be devaluation of a foreign currency, in which the debt is denominated. Here, the creditor loses to the extent of the rate of devaluation. For instance, the devaluation of Argentina's peso has taken its toll on many banks in the US, Spain and leading exporters to that country. Accordingly, a US creditor who had a receivable of one million Argentina pesos in early 2002 (when peso had parity with USD) would find the value in USD plunging from USD one million to USD 333K in a period of six months.

1.3 ROLE OF CREDIT

Idle economic resources can be effectively put to use through credit. Borrowers who do not have enough resources to pursue an activity can borrow the resources, which can be returned to the lender after having achieved the objective.

There is a practical difficulty for those with surpluses to identify potential borrowers. This is where financial intermediaries come in. Broadly, banks and other financial intermediaries collect economic resources—mainly in the form of deposits—from the public and engage in intelligent lending.

Financial intermediaries play an important role in any economy. From the macro economic perspective, the main function of the financial system in any country is to mobilize resources for economic growth. Financial intermediaries not only intermediate between savers and investors but set economic prices of capital, in line with the monetary policy of the nation.

Financial intermediaries play a vital role in making credit available. Financial institutions like banks which can retake the loan proceeds given to one party from another

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can, in fact, increase the credit availability in the economy. This is called 'credit creation' by banks. (*See Appendix A for details.*)

Prudent use of credit results in the economic growth of the borrowers, which in turn leads to overall economic well-being of the society and ultimately the country. Credit stimulates both household consumption and business investment. Hence, a national credit policy is an important tool used to encourage industrial development and business investments, thereby creating employment opportunities and improving the standard of living of the common masses. As purchasing power increases, people tend to spend more on consumer goods and this stimulates further economic growth. Remember how US Fed Reserve chief Alan Greenspan attempted to accelerate credit offtake, especially after 9/11, by slashing the interest rates to the lowest in the last 40 years.

1.4 CREDIT MARKET

Borrowers or users of credit can be classified into different categories. While classification varies depending on the context, the most commonly followed binary categorization is Personal Credit and Business Credit. In certain cases government credit is treated as third category. Another classification is based upon the type such as (a) student loan (b) housing loan/credit (c) mortgage (d) consumer loans (e) instalment loans (f) hire-purchase (g) credit cards and so on. Whatever classification is followed, some overlapping is unavoidable.

Personal Credit

The borrowing needs of individuals vary according to their financial status. These individuals may be salaried employees/self-employed/professionals such as doctors, solicitors or architects. Their needs to borrow money could be for purposes such as buying a house/car/furniture/home appliance; repairing or improving a house/-marriage/holidays, setting up a practice (in the case of professionals); children's education, etc.

In general, the demand for credit by individuals may be categorized into three types.

Low-income people: The demand for credit by this group of people is often limited, since they normally maintain a close balance between incomings and outgoings.

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Conversely, they may attempt to borrow to satisfy consumption needs which they cannot afford on limited income. This category of borrowers should very cautious in using credit unless they are able to identify alternative repayment sources.

Middle-income people: The demand for credit by this group tends to be much greater. This group may have significant financial assets (deposits/shares, etc), but these borrowers tend to show a preference for borrowing for the purchase of consumer durables or assets rather than liquidating their savings. They have realized that borrowing can be used not only as a way of meeting emergencies but also as a means for improving their standard of living.

Affluent people: Credit provides them additional flexibility and access to liquidity, especially if their financial wealth is locked in long-term investments, real estate or otherwise.

Business Credit

The granting of credit to commercial customers is more complex than the personal category. This is because commercial borrowers are engaged in a much wider range of activities and their needs for credit vary according to the nature and size of their operation. Demand for business credit emanates from companies, partnerships, sole proprietorships, clubs and associations, of different nature, size and intentions. They usually avail credit through person(s) acting on their behalf. Businesses are of different types with differing requirements depending upon their nature of activity. Accordingly, the type of funding required by an airline varies from the funding required by the retailer in your locality. The sources of credit not only include financial intermediaries such as banks, but also debt securities, trade credit by suppliers and deposits from public. But for business credit, world trade and economic progress of mankind would not have been impossible. *This book primarily focuses on business credit risk analysis*.

1.5 CREDIT: ANALOGOUS TO FIRE

Credit is like fire-the manner in which it is used determines if it brings woes or benefits.

Merits of Credit Usage. Let us look at the advantages of credit to the borrower:

• Wealth maximization: Credit is a vital part of the financial management of almost all entities engaged in economic activity—whether it is government, business enterprises

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or private individuals. It is common knowledge that in many countries government borrowings are siphoned off by the ruling elite and indirectly the burden falls on the shoulders of the common man. If the borrowing nations use the credit without corruption and inefficiency, it will not only result in more economic development, enhancing the standard of living, but will ease the burden on the population by obviating the need for additional revenue through direct and indirect taxation.

If used wisely, credit helps in multiplying wealth much faster and beyond the existing resources of a nation/business enterprise/individual. The reasoning and logic is simple. While the cost of a credit facility is fixed, if the borrower/user of credit can deploy it at a return higher than the cost of credit, the difference results in wealth creation to the borrower. For example, if you borrow Rs. 10,000 @10% cost and deploy it for 25% return, you end up with a wealth of Rs. 1,500/-. This fundamental concept has found its application in many financial theories of leverage and cost of capital, among others. (We will look more into it, later in this book when we discuss financial risks.) Productive employment of credit calls for good governance/management.

• Tax planning tool: The cost of borrowings is tax-deductible, which saves a proportionate portion of additional wealth from tax. Individuals also borrow credit as a taxplanning tool. For instance, Income Tax Act allows adjustments of interest and instalments on housing loans availed by the salaried classes and the self-employed.

Companies and business add value not only by value differential, but also through the tax advantage of borrowed funds. For example, suppose ABC Ltd starts operations with a project cost of Rs. 100 million, fully funded by equity on which it earns profit before interest and tax (PBIT) of Rs. 25 million after the first year of operations. Assuming a tax rate @ 50%, the net profit attributable to shareholders would be SAR 12.5 million with a return on equity (RoE) of 12.5%. Think what would happen if 50% is borrowed @10%. After meeting the interest costs of Rs.5 million, the PBT would be Rs. 20 million on which a tax of Rs.10 million would have to be paid. Attributable net profit to shareholders would be Rs. 10 million with an RoE of 20%. Notice the sudden jump in RoE due to the leverage effect.

If individuals borrow to create assets it will improve their wealth. Most individuals who borrow to construct or purchase houses or residential units, find that the market value of the house has outstripped the gross repayment obligations of the housing loan.

• **Business control**: When confronted with the choice of type of capital, many entrepreneurs prefer debt capital because they can retain control over the business. In the case of equity capital, the new shareholders have the right to ownership privileges,

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effectively reducing the existing owners' control over business. Secondly, while with borrowings the existing owners can enjoy the full benefits of the additional business after meeting the fixed finance obligations, additional equity capital means the new owners will partake in the whole benefits.

There are many advantages to society and the country from business lending. As businesses borrow more and spend, the local society/economy is benefited as it creates more demand. Business spending on credit has far-reaching implications for the country's economy, as it can drive up the demand for goods and services, accelerating economic growth.

• **Convenience**: The owners need not bring all the funds to run the show. They can obtain credit when required and settle it later, as mutually agreed.

Demerits of Credit Usage

However, using credit is not without disadvantages. As far as business credit is concerned, it is true that if the RoI (Return on Investment) exceeds the borrowing costs, the leverage is beneficial to the borrowers. On the flip side, when the RoI is lower than the borrowing costs, the borrower has to bring funds/cash from other sources to meet the interest obligations, over and above the principal portion. Any default will not only result in compounding of the interest burden, but charges such as penalty interest, etc., add to the woes. So, instead of improving shareholder value, it can destroy the value. Ultimately, the business entity could find itself out of business or in negative limelight. Trust built up over years could be lost. Unpaid financial institutions and suppliers and other creditors could take actions that would bring a bad name to the borrower in business circles. Almost all bankruptcies are caused by the creditors pressurizing the borrower to pay up.

Bankruptcies hurt the creditors too. In the US the bankruptcies during 2000 and 2001 were at a record high, resulting in the sharp drop of share prices of leading banks such as Citigroup and JP Morgan. Bankruptcies are universal. Some of the 'famous' bankruptcies are of CRB Capital (India), Yokokawa Securities (Japan) Daewoo (Korea), Worldcom, Enron, Global Crossing (USA), etc.

In the new environment of globalization and opening up of markets, corporate mismanagement and increasing competition, accurate credit-risk analysis becomes even more important today than in the past.

The main hazard for users of personal credit (i.e. individuals), is the tendency to spend beyond the means of an individual or household. Nowadays, easy availability of credit

from credit cards or other sources of credit tempts many to 'keep up with the Jones' otherwise known as 'demonstration effect'. It is not unusual to read in newspapers about people committing suicide because of debts. Another hazard of relying on credit is the fixed repayment obligations. Unexpected drying up of future inflows—say loss of job, fall in income from self-employment—result in repayment defaults and associated costs such as penal interests and finally confiscation of the collateral, if any, plus the associated damage to personal prestige. Similarly, contingent and unexpected expenses such as accidents, major hospital expenses, etc, which will strain the cash available for repayments, cannot be wished away. Since no accurate estimation of these events is possible, individuals/ households should always be conservative while borrowing.

Using credit for maximizing wealth is not that simple. Many nations and a number of companies have found that the 'debt trap' is deadly. Argentina and Enron are two examples.

An interesting example of business credit going beyond the limits and actually harming the country is that of Japan in the 1980s and 1990s. Too much credit has inflationary pressures. Riding on the wave of a booming economy during the mid-1980s most of the Japanese multinationals borrowed to create additional capacities, for which there was little market appetite. At the same time, a real estate boom flourished, fuelled by bank borrowings. As the expanded companies found little demand for augmented capacity, they found the repayment of the loans taken for expansion difficult. As the real estate boom began to decline, the real estate dealers who borrowed to buy up the properties also found themselves cash-strapped. In both cases, the repayment of the borrowings was tardy and sluggish, which, along with the cumulative and compounding interest burden, sent many companies and real estate dealers to bankruptcy. In turn, the lending institutions had to book huge credit losses, triggering the collapse of many banks/financial institutions, leaving thousands of stakeholders mired. So, although credit is a useful tool for the economy and meets several needs and demands of the population, it is a twin-edged sword. That is why the central bank authorities of a country are always vigilant in controlling credit flow in the economy. In capital-scarce countries, this is even more important as the scarce capital has to be channelled to meet the priority needs of the economy.

In short, whether it is business, or managing a country or personal wealth creation, the way the limited resources are managed has a significant impact. Maximization of wealth through optimal utilization of the resources is the true objective of financial management, in any context. While credit has contractual obligations, it can result in additional value

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creation (and hence impact wealth maximization positively) if prudently deployed. Debt within limits is safe and will definitely add value, contributing positively towards wealth maximization.

1.6 SUPPLIERS OF CREDIT

Major suppliers of credit can be briefly classified as follows:

a. Commercial banks: Commercial banks are among the important suppliers of credit in any country. They are the central to the banking system and constitute an integral sub-system of the financial system and channel small savings from households for deployment in the corporate sector. The Indian banking system can be broadly categorized into public sector banks, private sector banks and specialized banking institutions, such as co-operative banks, urban banks and rural banks. The largest public sector bank is State Bank of India and its subsidiaries. Private sector banks can be sub-classified into three types: Old private sector banks, which escaped nationalization as most of them deliberately did business below the cut-off mark that would have triggered nationalization. The second type is foreign banks operating in India and the third type is the new private sector banks, which came into being after 1991, subsequent to the implementation of Narasimham Committee recommendations. Since the nationalization of banks in 1969, public sector banks or nationalized banks acquired a place of prominence. In the last decade, Indian banking has come a long way from being a sleepy business institution to a highly pro-active and dynamic entity. This transformation has been largely brought about by the large dose of liberalization and economic reforms. Industry estimates in 2002 indicate that out of around 275 commercial banks (registered under the Banking Regulation Act, 1949) operating in India, 223 banks are in the public/co-operative sector and 52 are in the private sector, of which 24 are foreign banks, operating in India.

Commercial banks are the largest suppliers of the short-term finance for business requirements in all countries, although the structure of the banking system may be different from the one followed in India. However, the role of a central bank is prominent in all countries to regulate the operations of commercial banks. In India, the Reserve Bank of India (RBI) is the apex body for all matters relating to the banking system, and enjoys wide powers to discipline erring commercial banks.

Credit risk is very vital to the survival of commercial banks and hence one of the primary concerns of commercial banks and regulators. Given the importance of public confidence in the banking sector governments always want to keep commercial banks in good health. So, both central banks and governments are highly concerned about the credit-risk exposure of the banking sector. That is why the level of bad credit assets or non-performing assets is always measured and monitored on an ongoing basis.

b. Term lending/Development institutions: As the name indicates, their main function is to extend term loans, project finance and meet other long-term credit needs of the corporate sector. In post-independence India, a host of development finance institutions have been formed to meet the rapid industrialization requirements. Industrial Development Bank of India and Industrial Finance Corporation, State Financial Corporations, State Industrial & Development Corporations, Industrial Credit & Investment Corporation (now known as ICICI Bank) are the major names in India. Most of the state governments have their own State Finance Corporations to promote industrial development. In Japan and Korea development institutions had played a prominent role in industrializing and ushering in economic prosperity. Realizing their importance almost all nations in the world have formed development institutions.

c. Public debt market: While developed countries have a matured public debt market, in developing countries it is now in the growth phase. Large, established and usually listed public companies with enough credibility and financial standing bypass the banking sector and seek financing directly from the capital market, by way of bonds, debentures or commercial papers. Usually such debt issues require mandatory rating by credit rating agencies. After the debt issue, the rating agencies continue to monitor the financial position of the company. However, in the post- Enron/ WorldCom fiascos, rating agencies, especially those in the US face wariness from the public.

d. Other institutions in credit financing: A host of other entities undertake credit financing, as part of their normal operations. Housing finance companies such as HDFC, LIC Housing and other banking major subsidiaries (e.g. Can Bank Housing) are some of the significant players in this segment. Insurance companies have a large pool of resources at their disposal, which are deployed in a variety of lending/investment activities. Non-banking financial institutions (NBFCs) also play an active role in lease and hire-purchasing financing along with certain specialized subsidiaries of nationalized banks. Mutual funds deploy varying amounts of money in the credit market depending

Chapter 1: INTRODUCTION TO CREDIT

upon its nature. Chit companies form another important category of traditional suppliers of credit in Indian villages, towns and cities.

e. **Trade credit**: Another source of credit is the supplier/trader/manufacturer who offers credit for short periods, ranging from 30 to 120 days. While in monopoly situations the seller can impose stricter terms such as "cash in advance", competition compels liberal credit terms as a major source of competitive advantage. Trade credit is used by both domestic and foreign suppliers, with the latter having tendencies to protect it through letters of credit. Trade credit is a sales promotion technique. Lengthening and shortening of the credit period depends on the quantum of additional sales generated/lost as well as the financial power of the entity. As we will later see in 'Industry Risks' (Chapter 6) the credit terms prevalent in an industry are a function of the 'bargaining power' of suppliers and buyers. However, the choice whether to extend credit to a particular customer is a pure credit decision, more or less in line with financial institutions.

Different categories of suppliers of international credit exist. The world of international suppliers of capital (both debt and equity) is vast and sometimes bewildering, given the massive resources at their disposal. Both rich closely-held private companies (such as the Rothschilds) and multilateral institutions are active in international credit. Well known multilateral institutions include the World Bank, IMF, IDA, ADB, IFC, multinational banks and governments. Given the foreign exchange flows involved, over-reliance on international credit can bring havoc as has been proven by the repetitive instances of economic collapses around the world, in our recent memory. While in the 1980s and early 1990s the entire Latin America suffered, during 1997/98 it was the turn of the tiger economies of the Far East, while in 1998/99 both Turkey and Russia had to bear the brunt. The latest story of 2002 is of Argentina. India too had a close brush with such a situation in 1991.

A common element passing through all the categories of credit supplier discussed above, is the credit risk analysis. While this is an expanding area of knowledge, different types of suppliers subject the credit exposure to varying degrees of credit risk analysis. The collapse of banks/financial intermediaries in Japan and other countries, including India, under the weight of bad credit assets (credit losses) highlights the significance of credit risks. Wherever credit plays a significant role, the underlying risk should be thoroughly analyzed and managed.

Credit Risk Analysis (CRA) is more than establishing creditworthiness. In fact, creditworthiness is a vague term. There are ranges of creditworthiness, the proper grasp of which is critical to understand the probability and quantum of credit losses. Secondly, as

in other return/risk relationships, the level of pricing to be charged is determinable only if the underlying credit risk is properly evaluated. Thirdly, often the relationship between the creditor and borrower is longstanding, especially in banks and other financing institutions. Even in trade credit, the buyers continue to off-take goods and services for extended periods. Accordingly, most of the suppliers of credit are also interested in the upside potential of the customer although the downside risk is a vital consideration of credit risk analysis.

Given the multifarious nature of credit risk, the modern techniques of credit analysis deploy a variety of tools to study and understand its various ramifications. We will see the repertoire of techniques/tools used to study credit risk in the ensuing chapters.



Credit Risk

Credit risk exists whenever a product or service is availed with a promise to settle payment in future, as agreed upon. Credit risk is pervasive in both the business sector as well as the non-business sector where credit is used extensively. Individuals/house-holds who are electricity consumers, telephone users and credit card holders expose respective suppliers to credit risks. Similarly, banks/financing companies are also exposed to credit risk, in their day-to-day business operations.

2.1 MEANING OF CREDIT RISK

Credit risk can be defined as "the probability of the loss (due to non-recovery) emanating from the credit extended, as a result of the non-fulfilment of contractual obligations arising from unwillingness or inability of the counter-party or for any other reason." If the probability of the loss is high, the credit risk involved is also high, and vice-versa. The study of credit risk can be bifurcated to facilitate better cognition of the concept.

A single borrower/obligor exposure is generally known as firm credit risk while the credit exposure to a group of similar borrowers, is called portfolio credit risk. This



Fig. 2.1 Bifurcation of Credit Risk

bifurcation is important for the proper understanding and management of credit risk, as the ultimate reasons for failure to pay can be traced to economic, industry- or customer-specific factors. While firm risk decides the fate of overall portfolio, portfolio risk in turn determines the quantum of capital cushion required, which is a function of expected credit loss.

Up to now, we looked at credit risk assuming that both obligor and creditor are located in the same country. Institutions engaged in cross-county credit transactions would argue that credit risk goes beyond the customary view of 'default in repaying the principal and interest'. In such cases the credit risk may manifest itself in subtly different ways, depending on the financial transaction in question, and it is useful to distinguish three main aspects.

Settlement risk¹ arises when the conduit through which the payment is channelled fails to pay. For instance, sometimes monies sent from Middle-East to the USA have been frozen due to the suspicion related to terrorism links. Another reason could be the collapse of banks (e.g. Herstatt Bank in 1974) which had received payments from a number of counter-parties but went bankrupt before payments could be made to the other legs of the transaction. Settlement risk is now being reduced through the initiatives of Bank for International Settlements (BIS), Switzerland.

Another credit risk emanating from cross-border credit is **sovereign risk**, which occurs if the government imposes controls. While the obligor is willing to settle the credit, the government may not allow it.

Foreign currency risk is the loss of credit value resulting from adverse foreign exchange fluctuations.

Accordingly, creditors with significant exposures to foreign markets would prefer to look at how these three risks impact both firm risk and portfolio risk.

Evaluating credit risk is a matter of information processing, which is getting complex in line with the advancement in various areas, technological or otherwise. Certain factors triggering credit risks are controllable while others are not. Understanding and differentiating between the two is highly critical for sound credit risk analysis and management.

¹ Settlement risk is also known as Herstatt risk after the infamous collapse in 1974 of Bankhaus Herstatt, an established German bank. Herstatt ran into funding problems in the middle of a trading day and was immediately closed down by Bundesbank (German Central Bank), by which time most of its FX counterparties had already issued their payment instructions for that day. *Those banks never received their counter-payments on time and it took them years to settle the issue.*

2.2 CAUSES OF CREDIT RISK

Credit risk is subtle and hidden and has to be unearthed carefully, especially in view of the fact that the returns for credit risk are much lower than for other kinds of investments such as equity or real estate. The ultimate credit risk originates from several factors having an international touch (1997 Asian Crisis or Sept 11, 2001) or domestic issues (changes in govt. policy or industry) or company-specific reasons.

Both firm credit risk and portfolio credit risk are impacted or triggered by systematic and unsystematic risks (Fig. 2.2). The ensuing chapters discuss the various levers of impact and how mitigations can be effected. Obviously, rigorous study of credit risk through meticulous dissections is the hallmark of a good credit risk analysis. Not only financial intermediaries and large multinationals, but also all classes of medium/large businesses will benefit from thorough credit risk analysis as it will minimize bad debts and associated costs, such as collection charges, administration time and costs of followup, litigation, etc.

External forces that affect all businesses and households in the country or economic system are called systematic risks, and are considered as uncontrollable risks. For instance, if the economy is witnessing a sharp economic crisis/recession, bankruptcies will increase, triggering credit losses, while stock markets will decline due to lower corporate profits while unemployment rises, among others. *Thus, systematic risks impact all in the playground (viz. economy).* Similarly, political risks such as a military coup, new elected government discontinuing certain policies and programmes, wars, terrorism, international isolation, etc, can severely impact the quality of a credit asset and may lead to losses and are also considered systematic risks. The second type of credit risks,



Fig. 2.2 The various triggers of Credit Risk.

the unsystematic risks/controllable risks do not affect the entire economy or all business enterprises/households. *Such risks are largely industry-specific and/or firm-specific.* A creditor can diversify these risks by extending credit to a range of customers. We will see more of this in the following Chapters.

2.3 CREDIT RISK AND RETURN

The primary objective of a business firm taking credit risk is to earn a return. While the financial intermediary earns commission or interest income, the non-financial firms benefit in the form of enhanced sales, resulting in more profits. Economic agents involved with credit risk will attempt to (a) maximize return for a given level of credit risk and/or (b) minimize credit risk for a given level of return.

In financial intermediaries who directly involved in lending or investing in bonds and debentures, the relationship between credit risk and returns is explicit, while in non-financial firms, the relationship is implicit and embedded in the profit element. However, one fundamental is common—given the probability of default, is the return offered by the prospective credit decision attractive?

2.4 CREDIT RISK ANALYSIS

Credit risk analysis (CRA) is the study from the perspective of a supplier of credit of a present/prospective claim on other economic agents (both disaggregation/aggregation basis) in the form of debt, including trade receivables, loans, public securities, among others. CRA is valid in a variety of decision contexts. A few such situations are discussed below:

• *Commercial bank/Financial institution*: What are the risks involved in extending a loan to a particular firm? Given the risk level, how should it be priced? What about its repayment capability? Is the management capable? Which economic and industrial factors will impact the performance of the firm?

• *Mutual funds*: Shall we invest in the debentures/bonds of XYZ Ltd? What about the financial position and major solvency ratios? Are the indenture provisions adequate? What are the major factors that may trigger distress and default on debt? Given the risk level, is the return acceptable?

• *Manufacturer/Trader*: Should we extend credit to this customer? If so, what is the credit period to be offered? What are the financial position and bank facilities enjoyed by the customer? Is collection risk manageable?

The credit risk, embedded in these routine decision situations, has to be carefully evaluated. While the selling price and delivery terms are important for a non-financial business entity and secondary capital market considerations weigh in the mind of a bond investor, credit risk is the most critical factor. If all other factors are favourable but credit risk is very high, the outcome is a foregone conclusion.

Besides suppliers of credit, there are other parties who have general interest in the creditworthiness of an economic agent. This category does not engage in detailed examination of credit risk, but their decisions are influenced by the credit standing of the firm/business. For instance, a potential customer will check the probability of the financial distress of the manufacturer to ensure its survival so that he can be reasonably assured about the warranties and replacement parts and other services. Another interested party is the auditor, who will check the probability of an imminent financial distress while evaluating the applicability of 'going concern concept' of the firm under audit.

Credit risk analysis is important to borrowers as well. It enables them to understand what the usual considerations of banks and financial institutions are, while extending credit facilities. This not only facilitates proper presentation of facts but also enables the borrower to decide about the most feasible sort of financing.

2.5 HISTORICAL PROGRESS OF CREDIT RISK ANALYSIS

Credit risk analysis has existed since early days of civilization and can be considered as one of the oldest established financial activities known. Throughout history, the act of lending funds has been accompanied by an examination of the ability of the borrower to repay the funds. Ancient civilizations and societies had their own forms of trading and banking activities. The medieval bankers of Europe studied the business activities of their clients and often decided the outcome of wars and the fate of monarchies while financing. They relied largely on character and direct knowledge of the borrower. Majority of the credit transactions and lending can be categorized as 'name lending'.

As modern accounting and finance developed during the late 1800s and early 1900s, so did credit analysis techniques, which became more systematic and detailed. During the early days when a financial statement-based approach of credit analysis was gaining popularity, the primary emphasis was on the corporation's balance sheet. Financial strength or weakness as displayed by the balance sheet depicted the ability of a corporation to withstand bad times. Sufficiency of assets and their quality and the owners' contribution to the business can be useful indicators of the soundness of the financial base. As the years went by, the emphasis began to shift to the profit and loss account as the sustainability of earnings was given prominence.

Meanwhile, the business world was witnessing major changes simultaneously. Management consulting, decentralization and newer management concepts, development of management accounting and various other initiatives were unfolding in the business field. By the 1970s, given the inadequacies of the balance sheet and P&L, funds flow statements emerged, which of late have given way to cash flow statements. Today, financial analysis has become an inseparable part of credit risk analysis, and almost all kinds of financial intermediaries employ finance specialists.

In the recent decades, the process of credit risk analysis has been changing from an uninteresting and routine procedure to a new generation of state-of-the-art techniques. Today, credit professionals are armed with not only finance, management and mathematics related qualifications but also learn new skills budding in the arena, on a continual basis.

The Basel Committee is trying to revolutionize the way banks manage credit risks through its proposed new Accord (known as Basel II Model expected to be implemented by 2007). Progressive financial intermediaries are attempting to implement portfolio theory, value at risk, optimization and other techniques/models, among others to manage and maximize returns from credit portfolios. While most of these models are 'work in progress' rather than finished solutions, it is beyond doubt that credit risk management is now more challenging and stimulating.

2.6 NEED FOR CREDIT RISK ANALYSIS

Let us examine why so much importance has been attached to credit risk analysis, especially by banks and other financial intermediaries with significant credit exposure. Here are 10 main reasons:

Chapter 2: CREDIT RISK

1. **Prodence**: It is the responsibility of the supplier of credit to ensure that their actions are prudent, because excessive credit will prove destructive to everyone involved as has been evidenced by the demise of many banks in Japan during the past decade, as the result of overlending in the late 1980s. Excessive credit has an important role to play in the boom and bust of the economic cycle, and is precisely one of the major reasons why Greenspan attempted to put the brakes on the US economic expansion in 1999–2000 by hiking interest rates. Usually everyone is confident during the heightened pace of economic activity, and financial institutions are no exception. They lend to overconfident borrowers to expand or import or produce more goods and services for which there is little demand. This leads to the creation of overcapacities funded by borrowings. The consequent bad debts result in the collapse of financial intermediaries. Lending during the boom-phase is highly challenging. So is providing credit during a recession period. It pays to do your homework well and conduct a proper risk analysis of the credit, both on an aggregation and disaggregation basis. Ascertain, measure and manage the credit risk in such a manner that it does not spin out of control.

2. Increase in bankruptcies: Recessionary phases are common in the economy, although the timing and causes may be different for different countries. Numerous examples exist in recent history. As stated earlier, Japan (in 2000s) is yet to recover fully from the recession that hit its economy after the boom of the 1980s, while Latin American countries seem to be among the few countries experiencing a rather quick succession of cycles. Far East Asia had the crisis in 1997/98 while the oil-dependent Middle-East nations faced an economic slowdown in 1998/99. In 2002/03, the US economy went through massive job losses and sluggish growth and was almost on the verge of an economic slowdown. So was Germany. Given, the fact that the incidence of bankruptcies during recession is high, the role of accurate credit analysis hardly needs to be emphasized.

3. **Disintermediation**: With the expansion of the secondary capital and debt markets, many good credit-worthy customers, especially the larger ones access and raise funds directly from the public. Debentures, commercial paper and bonds are popular among companies that access public debt market directly. The firms that are left behind rely on banks and financial intermediaries. Since credit rating is compulsory for raising debt from the public market, the firms that are not able to fulfill this requirement approach financial intermediaries. This can result in the lowering of the quality of the credit asset portfolio. Hence, a more vigilant approach by the lenders is necessary.

4. Increase in competition: The banking business is witnessing more competition with the advent of the new generation banks and liberalization policies pursued by

governments. With the increase in the competition, naturally pricing is under pressure. When the margins get thinner, even the previously accepted level of bad debts would become unacceptable. In other words, as your returns become lower, technically your risk level should also reduce. So, increase in competition is yet another reason for tighter credit risk analysis.

5. Volatility of collateral/asset values: Gone are the days, when collaterals offered comfort. While it is no longer easy to insist on collateral, in view of the increasing competition in the market, the values of collateral also fluctuate widely as has been witnessed in the Far East and Japan crises. Land and real estate prices in various parts of India also witness wide swings. The property/real estate prices that touch record highs during booms, later may not quote even half the value of the credit extended during the boom period. Here is an interesting example from the automobile world: When the prices of Maruti cars were slashed in 2000/01, many lessees reportedly defaulted and returned their vehicles, because they were in a position to buy new vehicles with the remaining unpaid lease instalments!

6. **Poor asset quality**: Banks in India and abroad face the problem of non-performing assets (NPA)—credit assets that are on the verge of becoming credit losses. In other words, they display high risk tendencies to become bad debts. NPA management is a major challenge for banks. One of the major constraints on the competitive efficiency of banks is the propensity to accumulate poor quality assets. Note that Nedungabi Bank and Global Trust Bank collapsed due to large NPAs. As Table 2.1 shows, the level of gross NPA of all groups of banks for the last three years is on the rise, though the rate of growth has decelerated.

As is evident from the table, public sector banks have the highest level of NPA while foreign banks have the least. Compared to international standards the NPA level is still high.

7. High impact of credit losses: It is a common perception that a small percentage of bad debts is acceptable and won't do much damage. However, unfortunately this is not true. Even a small credit facility turning bad will hurt business, especially for banks and other financial intermediaries operating in a highly competitive sector. For example, suppose a bank, which makes an average spread of 2%, suffers a credit loss of Rs. 2 million, then it has to deploy Rs. 100 million in further lending to recoup the credit loss (2M/2%). Additional business to be booked to recover the loss is 50 times the loss suffered. Minimizing credit loss is the best option rather than attempting to book 20, 25 or 50 times the business volumes, to ensure adequate returns to shareholders.
| | | | | (Rs. Crore) |
|--|-------------|--------|--------|-------------|
| Bank Group | Gross NPAs* | | | |
| | 2000 | 2001 | 2002 | |
| Public sector banks | 53,033 | 54,773 | 56,507 | |
| | (14.0) | (12.4) | (11.1) | |
| Private sector banks | 4,761 | 6,039 | 11,672 | |
| | (8.2) | (8.4) | (9.7) | |
| Foreign banks | 2,614 | 3,071 | 2,726 | |
| | (7.0) | (6.8) | (5.4) | |
| Total | 60,408 | 63,883 | 70,905 | |
| | (12.7) | (11.4) | (10.4) | |
| * Source RBI. Figures given in parenthesis are gross NPAs as percentage of gross advances. | | | | |

Chapter 2: CREDIT RISK

 Table 2.1 NPA levels in Indian banking sector.

8. Proliferation of limited liability entities: Limited liability enterprises emerged as a solution to the expanding world trade of the mid-1800s. Unlike in proprietorships and general partnerships, liability of the owners/shareholders of limited liability companies (LLCs) is limited to their original contribution of capital. While this accelerated risk taking, the new arrangement shifted the onus on the creditors to ensure the credit-worthiness of the business enterprises, separately from the shareholders. Accordingly, they have to satisfy themselves as regards the cash generation capacity of the LLC itself, unless of course they can derive unlimited guarantees from the shareholders/owners of the LLC, which still falls short of the unlimited liability of unincorporated entities. Another major corollary of LLCs was the advent of public financial statements as the ownership of the LLC and management got separated. Audited financial statements, which began primarily as an instrument of communication between the shareholders and management are now used and analysed by several external parties, including creditors.

9. **Off-balance-sheet transactions**: As the business environment and nature of businesses itself get complicated, business people are in search for various risk reducing/ risk shifting transactions. Derivatives of numerous shapes and categories are being used by companies to control foreign exchange exposures, interest rate fluctuations, commodity price volatility and so on. Usage of other off-balance-sheet transactions such as operating leases, factoring with recourse, discounting of bills, etc, is not uncommon.

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The obligations arising from these off-balance sheet items, can sometimes create havoc in the business and even result in bankruptcies, as has been proved by the collapse of Enron in 2001. In-depth credit analysis is a must to unearth the real credit standing of a firm extensively using derivatives.

10. Risk vs return matching: Different levels of risk require varying returns. As the credit risk climbs, so should the returns, in order to compensate for the higher risks undertaken. A quality credit risk analysis structure is inevitable to understand the real risks involved while extending a credit, which then should be priced appropriately. Each credit should not only be analysed and mitigated thoroughly, but also priced adequately. In the absence of credit risk analysis, higher risks will be undertaken for inadequate returns, with predictable consequences.



Managing Credit Risk

Elimination of credit risk is impossible as long as credit forms an integral part of the economy. The organization should manage the credit risk in such a manner that it does not spiral out of control. In the meantime, the organization faces other types of risks too. Where does credit risk stand among them?

Let us now establish the context of credit risk for an organization as a whole and see how credit risk management is implemented. Sound credit risk management presupposes the presence of a good system of credit analysis that will prop up the credit risks to be dealt with. An organization that manages credit risk well will succeed and attain its business objectives.

3.1 STRATEGIC POSITION OF CREDIT RISK MANAGEMENT

The importance of the role of credit risk management within the broad framework of an organization is a function of the extent of credit exposure a business takes in its day-to-day operations. Financial intermediaries who are active in the credit market provide utmost importance to this function. However, it is crucial to note that financial intermediaries are also exposed to other risks such as liquidity risks and market risk. In non-financial businesses, there are other risks which take priority over credit risks. For instance, in a pharmaceutical company, quality risk may be the most important although credit risk is a matter of concern insofar as the company sells on credit.

While the risks of an organization vary depending upon the core operations, generally the following types of risks are common to most businesses:

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- Operational risks arising from day-to-day operations. While credit of a cheque to a wrong account poses an operational risk at a bank, pilferage of stock is the operating risk for a retailer.
- Market risks cropping up from the business environment in which the firm operates. A new product launched by a competitor or the emergence of a new competitor are two of the common instances of market risks.
- Legal risks resulting from the various legally binding agreements entered into by the firm or because of the contravention of the laws of the land.
- Computer/system risks arising from the information technology used and associated systems and procedures. While system crashes due to several reasons can wipe out vital databases, misuse of the system by unauthorized personnel is yet another risk.
- Reputation risks emerging from factors that would lower the goodwill and reputation of the business in the public eye, impacting business prospects.
- Financial risks like liquidity risks and improper balance-sheet structure.

The importance and relevance of credit should be defined in the overall context of the entire gamut of risks faced by the business entity. If the credit risk is minimal as in the case of cash-based businesses, then the credit risk function will be given least importance. On the other hand, in the case of banks with significant credit portfolio, credit risk management is of paramount importance. Similar is the case with all financial intermediaries. For most non-financial businesses also, credit risk can be considered as critical and is usually regarded as one of the major risks to be monitored.

3.2 CREDIT RISK MANAGEMENT CONTEXT

Credit risk management cannot be isolated from the overall organizational context. The goals and strategies of credit risk management emanate from the overall mission and vision of the entity. Similarly, it is defined in relation to the other core essentials for the survival of the business, depending upon the circumstances. While a profitable deposit-taking financial intermediary may forgo a good credit exposure for ensuring solvency, a profitable non-financial enterprise operating in a highly competitive market may extend more credit period to good customers. While liquidity is important for any business, it is of paramount importance for a deposit-taking financial intermediary, which otherwise would be risking a run. Risk appetite is invariably linked to the corporate philosophy, culture and strategic perspective of a business organization. For instance, certain banks

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are known for an aggressive approach towards credit risks, while others are marked by their cautious approach. Credit risk appetite is also dependent upon the human, financial and operational resources an organization has. A SWOT analysis of credit risk management is advisable on a periodical basis.

3.3 OBJECTIVES

While the ultimate nature of the credit risk borne by a financial and non-financial enterprise is the same, the objectives differ. A financial intermediary (FI) takes credit risk to earn financial income in the form of interest income or otherwise. A non-financial entity takes it to enhance the sales/revenue. While the mission and vision of an organization are almost permanent the objectives are subject to frequent changes as they adjust to the dynamism of the business environment. The best analogy can be that of ship sailing to its destination. The unpredictable sea conditions may force the Catering Manager in the ship to alter his objectives—the meals per day may be cut to three from four, to ensure food for all during the period of the unexpected delay. Similarly an FI or a non-FI, which has faced huge credit losses in the immediate past will have the objective of ensuring maximum credit quality and may tighten credit policies—accepting only high quality credit customers, even at reduced pricing. Having attained the goal in a couple of years, they will usually find that they have lost market share because of the tight policy and may decide to be a bit liberal to gain more business, while ensuring that the previous bad credit experience is not repeated. This is yet another objective of credit risk management: To maintain a historical default database, which will be used periodically to conduct back-testing or stress-testing of the credit quality of the portfolio. The objectives of credit risk management are to (a) minimize bad loans (b) price credit risk adequately (c) maximize benefits from potential credit opportunities (d) adhere to credit policies and (e) maintain a reliable database.

3.4 STRUCTURE

In order to ensure the attainment of the credit objectives, various strategies and steps have to be implemented, which requires a structure with specific functions. The structure should be adapted to the strategies, which emanate from the objectives. For instance, while tight credit risk policy may result in centralization of approval powers, a lenient attitude towards the risk to garner higher market share may require the strategy of decentralization of such powers. Usually, in financial intermediaries, an

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authority—General Manager (Credit Risk) or equivalent—is in charge to ensure the attainment of the goals and is answerable to the Chairman/Managing Director and to the Board. A talented pool of credit experts and specialists at both macro and micro levels is essential for effective credit risk management. They are to be divided among a number of departments with a clear definition of how they participate in the risk identification and management processes. In non-financial organizations, usually the top authority of credit risk management lies with a Credit Controller, who reports to the Finance Manager/Finance Director or equivalent.

3.5 CREDIT RISK CULTURE

This is a set of values and beliefs shared by the people in credit risk management. The creation of the right risk-aware culture goes a long way in ensuring effective credit risk management. Proper training of credit risk management staff, risk-conscious top cadre in credit risk management, proper two-way communication, establishment of detailed credit policies and standards and strict adherence to them are some of the effective methods to ensure a strong credit risk culture in an organization. A well understood credit risk culture will enable the decision-takers and other employees in credit risk management to take effective and intelligent risk decisions. The employees can imbibe credit risk culture in dissimilar ways. Different organizations have their own methods of achieving this. While most of the nationalized banks take junior officers with cut-off age of mid-20s, through a rigorous selection process and train them through hands-on approach and mentoring, new generation private sector banks and many foreign banks are open to credit professionals from varied environments and attempt to achieve a blended credit culture.

3.6 CREDIT RISK MANAGEMENT IN NON-FINANCIAL FIRMS

In the case of a manufacturing or trading firm, extension of credit is essential for sales promotion. Usually they finance customers' purchases on an unsecured basis for periods ranging for one month to six months. Extended credit running into years with the support of bank guarantees or letters of credit is not uncommon.

Well-established businesses have credit control systems to ensure creditworthiness and monitoring of credit customers. While extending credit the supplier expects that the buyer will have enough resources at his disposal to meet the commitments. Such an assurance is the product of credit risk analysis.

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Importance of the credit risk analysis function in non-financial firms is evident if one searches any of the major employment search websites such as *www.yahoojobs.com*. Such advertisements (for credit analysts, credit controllers, etc.,) highlight the importance of credit executives in non-financial firms to assess credit risks, assign credit limits to customers in different channels of distribution, approve new credit customers/excess in credit limits and decide necessary collection efforts, among others. The importance of the credit function in Asian non-financial firms is also on the increase.

The goal of CRA in non-financial firms is to protect the investment in receivables. ('Receivables' are amounts of money owed to the firm (seller) by its customers (buyers) for goods (including raw materials and/or services) supplied. It is an integral part of credit management, which supports the sales force in their efforts to maximize sales without endangering the survival of the business firm.

In many companies the receivables are among the largest assets appearing on the balance sheet and require significant commitment of precious working capital resources. An increase or reduction in the amount invested in receivables will usually have a significant (negative or positive) impact on the company's cash flow and on the company's cash cycle, which is the time required to convert goods into cash.

The risk of loss of a receivable and the danger it presents to the survival of the company is the primary force behind the need for CRA and its management. The loss of a large amount of working capital by way of bad debts can almost lead to the failure of a company. While the credit risk management techniques discussed in this book are applicable to both financial and non-financial enterprises, usually most non-financial entities use a credit management approach, which is a watered down version of the techniques used by financial intermediaries.

3.7 CREDIT RISK MANAGEMENT IN FINANCIAL INTERMEDIARIES (FI)

Given the fact that most of the financial intermediaries, especially banks and financial institutions, have credit assets constituting more than 40% of the total assets, the importance of the systematic study and analysis of credit risk hardly needs to be emphasized. All employees should be made aware of the need of credit risk consciousness. The approach used by commercial lenders is elaborate and follows a comprehensive credit analysis. The steps usually followed by a financial intermediary are given below:

Vet nature and purpose of the credit: The purpose should be one acceptable to the lender, i.e, it must be legal, non-speculative and in accordance with the lender's

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priorities. It must also be used to finance the customer's normal business activities. The amount should be sufficient for the purpose and reasonable in relation to the customer's own resources. In principle, there is little point in financing a potential borrower who cannot give a satisfactory reason for use of the credit proceeds.

Decide on type of credit facility: An overdraft is a facility that allows an individual entity to withdraw funds from the current account in excess of the credit balance up to an agreed limit. The customer is charged interest only on the used portion of the amount. Loans, on the other hand, are fixed amounts for a fixed period of time and unlike overdraft cannot fluctuate. When the loan is granted, the full amount of the loan is debited to a loan account. Loans can be short-term or long-term. Another major sub-set of credit facilities extended by FI is known as non-funded lines, which includes letters of credit and guarantees, where no funds are provided. Open line of credit, revolving line of credit, working capital loan, term loan, lease financing, hire purchase and a host of similar credit facilities are currently available.

Check capacity to borrow: The lenders should check the legal status of the person who avails credit. Usually minors, undischarged insolvents, mentally incapacitated persons and in certain societies, women, or sometimes married women, are disqualified from entering into contracts on their own. In such cases a guardian is a must. Similarly, while extending credit to artificial legal persons, the lender should ensure that the persons representing such incorporated entities have the requisite authority to act on their behalf.

Decide on security: Whether security is to be sought depends on the level of creditworthiness. If the creditworthiness is high and the resultant credit risk low, lenders will not insist on any security at all. When security is required, several factors should be considered—such as adequacy and authenticity of the security offered. The security can be either primary or collateral. Receivables, stock, machinery and equipment, real estate and guarantees are accepted as security amongst others.

Analyse borrowers' financial status: An analysis of the financial position of the borrower is one of the essential preludes of credit. The fundamental question in the financial analysis is the ability of the business to generate adequate cash flows from operations to meet commitments. Various measures to gauge solvency, liquidity, efficiency, repayment capacity, etc., have been developed to study financial parameters relevant from a lender's point of view.

Forecast the repayment ability: The lender should have reasonable assurances about the ability of the borrower to meet commitments when they fall due in the future. The

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shorter the duration of the loan, the more predictable the repayment ability is. That is why the analysis of project finance and long-term loans are different from the techniques followed for assessing the repayment ability of short-term loans.

Assess profitability: The commercial lender incurs costs in making credit available to customers, which should be recovered from income from credit. Salaries to employees involved in appraising, granting and monitoring the credit, rent and other overheads should be recovered from the return generated from the credit besides the cost of funds.

Structure credit facility, including conditions and covenants: The credit facilities should be structured to suit the purpose for which they are intended to be used. Both the borrower and supplier of credit have to agree upon several issues, which should be formalized. Credit facility agreements specify mutual expectations of the borrower and lender and their respective duties and obligations. Violation of conditions is tantamount to default and the lender can repossess the goods or start legal proceedings for repayment, depending upon the terms of agreement. The supplier of credit should avoid loopholes in agreements and should be meticulous in drafting credit facility agreements.

IIIIII. Firm Credit Risk

PART TWO



Fundamental Firm-Level Risks

The number of risks that can affect the performance of companies is infinite. While taking a credit decision, it is vital to cover at least the most important risks that affect the fortunes of an individual business firm. As we have seen earlier, credit risks should be studied from two angles—firm-level or business-unit-level and portfolio-level. Firm risks are studied to understand the probability of credit loss (viz. credit risk) from a single customer. Portfolio risk analysis attempts to examine credit risks at the macro level and studies the likelihood of loss emanating from exposure to particular classes of customers. Firm-level credit risk is relevant from the portfolio risk point of view as well. Portfolio credit risk is a cluster of firm-level credit risks (although the study of the behaviour of credit risks at the macro level needs a different approach). In this chapter we will examine the firm-level forces impacting credit risk.

4.1 FIRM RISK CLASSIFICATION

Firm credit risk analysis involves two parts—study of (a) operating risks and (b) financial risks. The bifurcation of overall credit risk is important because a business firm can fail or default on credit due to purely financial reasons even when normal business risks remain at acceptable levels, and vice-versa. In credit parlance all such events impacting the credit-worthiness of the obligor/borrower/counter party are known as 'credit event'.

Business Risks or Operating Risks (OR)

Credit events of non-financial nature are known as operating risks. Business or operating risk (OR) originates from the dynamic operating environment of the business. It is usually

defined as the hazard that an event or situation will adversely impact a company's ability to achieve its business objectives and execute its strategies effectively. OR includes all risks that arise both inside and outside the company. Failure of an organization to optimize its assets—both tangible and intangible—resulting in the loss of the company's competitive edge, is also an OR. Good business risk management can enable a company to make rational business decisions when faced with the powerful and dynamic forces shaping the local or domestic and global arena. Study of OR encompasses study of changes in economic, regulatory, climatic, industry and demographic factors, geo-political and government changes, product innovations/substitutes, quality of management and other internal factors, among others.

Events originating from the operating environment are numerous and in order to study the operating risks, it is better to structure them into three sub-components: namely (a) external risks (b) industry risks and (c) internal or company risks. In fact the relevance and broadness of these variables are different, as illustrated in Fig. 4.1.

External risks are the broadest of the three, occupying the outermost layer, and comprise national and international developments, economic, social, cultural and political factors, among others. Industry risks are specific to a particular sector or industry. Although company/internal risks are the narrowest of the three, they are more critical because entity-level strategies and tactics determine the fate of a business unit as it deals with the challenges and opportunities emanating from external and industrial factors.



Fig. 4.1 The relevance and broadness of the sub-components of operating risks.

Financial Risks (FR)

Credit events that originate purely from the financial aspect of the business are known as financial risks. While most of these are of internal nature, these risks are so important that if not properly tackled, they can lead to collapse of businesses. Studies have found that many businesses fail because of inadequate finance function. Financial risks can be understood through the analysis of financial statements. We will discuss more on financial risks in Chapter 8.

4.2 RISK MATRIX

In order to understand the firm's credit risks properly, both operating risks and financial risks should be studied together. Operating risks should be analyzed and linked to the financial performance of the company. Financial risks should be identified and linked to the operating environment to determine the likelihood of the financial risks triggering a crisis situation. For instance, the state of the economy and industry will have an influence on the profit margins of a business, which will affect its financial performance. Similarly, a business operating with high financial leverage will face a tough time if there is a downturn in the economy or industry. A broad overview of the relationship among operating risks and financial risks vis-a-vis credit risk (CR) is given in Table 4.1.

This matrix depicts the relation between OR and FR and shows how these two levers operate upon the pure credit risks of a micro credit. A sound understanding of the OR and FR of the entities in which a financial or non-financial entity is taking credit risk exposure is essential because it triggers seeking of appropriate risk mitigation tools/techniques. The table does not amount to a credit rating exercise, although it is an

OR FR	Low	Medium	High
Low	Very Low CR	Low CR	Medium-High CR
Medium	Low CR	Medium CR	High CR
High	Medium-High CR	High CR	Very High CR

Table 4.1 Risk Matrix Table

essential part of it. The credit rating exercise is broader and takes into consideration factors such as security available and other debt indenture provisions.

4.3 DIFFERENT RISK LEVELS

Low Operating Risk and Low Financial Risk

The firms rated under this category have the least possibility of throwing up inconsistent performance or qualifying as an unsatisfactory credit asset. The credit to such firms is of highest quality. The operating risk is low and it is usually anchored by stable market conditions and good management and well-accepted product/service among its satisfied and increasing clientele. The financial position is also highly satisfactory with moderate debt usage, excellent debt service capacity and access to capital markets. Usually these firms enjoy dominant position in the market, or are market leaders.

Low Operating Risk and Medium Financial Risk

These firms differ from those discussed above in one aspect—financial risks are slightly higher. Debt usage tends to be more than moderate, and while financial position, profitability and cash generation are satisfactory, they are slightly lower than the category discussed above. However, the quality of the management, market share, good reputation, strong brands, etc, ensure low operating risks. These firms are effectively insulated from fluctuations in the operating environment given their sustainable competitive advantages such as low cost base or strong brands.

Low Operating Risk and High Financial Risks

In this category, the financial position is rather unhealthy if not weak, and characterized by unstable financial performance, although operating risks remain low. This situation happens when the firm ignores the financial aspect. There are many instances, where even when the business has grown big enough for a full-time finance manager, the owner/entrepreneur will attempt to handle the finance function himself with the help of semi-skilled staff, which ultimately results in weak finance function. Liquidity crisis, high interest outgo, poor collections, undue levels of stock, high cost of capital, etc, are some of the conditions which can push the firm into bankruptcy. However, the positive element is that the sooner the finance lacuna is rectified, the faster the problems are solved and the firm can migrate into better classes of classification.

Chapter 4: FUNDAMENTAL FIRM-LEVEL RISKS

Medium Operating Risk and Low Financial Risk

The operating risk could be medium because of the severity of competition or strong bargaining power of suppliers/buyers. The market conditions may be somewhat unstable while the management and the product/service are satisfactory. The nature of business may be cyclical or impacted to a significant extent by the fluctuations in the operating environment. The market presence, although satisfactory, cannot be termed as dominant. The financial position is highly satisfactory with low-moderate debt usage, excellent debt service capacity and access to capital markets.

Medium Operating Risk and Medium Financial Risk

This can be generally termed as an average credit risk, and most of the medium-type businesses fit into this category. The management at the critical positions is satisfactory, and the size of firm tends to be around the mean size of the industry/business. The product/service is accepted in general, but the firm is not perceived as the market leader. Financial risk is medium with moderate debt usage and average debt service capability and asset quality. The profitability, solvency and liquidity positions are satisfactory, but cannot be classified as excellent.

Medium Operating Risk and High Financial Risk

These firms differ in one aspect from the class above. The finance function is ignored or the balance sheet is overloaded, with significant external debt and negligible support from owners/shareholders. High leverage, liquidity problems, high cost of capital, high interest burden, unproductive and high overheads are some of the symptoms. Streamlining of the finance function can help the firm to improve its creditworthiness in most cases.

High Operating Risk and Low Financial Risk

Business prospects are uncertain due to the external, industry or internal factors of the entity. However, the comforting factor is the good and satisfactory financial position or financial management. Potential vulnerability looms large as the high operating risks may fast erode the financial position. A good example is a company in a highly cyclical business facing recession-induced low demand, projecting losses for the foreseeable future. However, strong financial position with minimum external finance may see the company through the cyclical phase.

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High Operating Risk and Medium Financial Risk

As in the case above, the business prospects are uncertain due to the external, industry or internal factors of the entity. Management is weak or dishonest, requiring continual attention from the lender/supplier of credit. The financial position and financial management are not comforting, although not as worse as other factors. Capacity to repay the credit is impaired. The credit asset is inadequately protected by the net worth of the borrower/obligor. Some credit loss appears unavoidable.

High Operating Risk and High Financial Risk

A business with these features should be dropped like a hot potato. Not only are the business prospects and external environment murky with weak management, the financial position and financial management display vulnerability. Capacity to repay the credit is so impaired that based on the overall situation the collection of the claim is doubtful and may be written off partially or fully.

4.4 MIGRATION

More often than not, the decline in the creditworthiness of the borrower/obligor is a gradual process, which is otherwise known as 'migration' in credit/financial parlance. Credit migration (of a low risk credit asset to a higher risk level) and vice-versa depends upon the change in operating and financial factors of the business firm. Hence, the supplier should review the credit or credit line on a periodical basis and/or on occurrence of credit events.

Credit loss, which is usually the end result of a business failure, is not an abrupt process happening overnight. However, the general public and sometimes even seasoned credit professionals believe that business failure is a sudden phenomenon. In fact there is a psychological reason behind this. Everyone concerned with the business failure—senior management, auditors, loan managers, analysts, etc—have good reasons to present the business failure as an abrupt event: They would want to give the impression that the business failure was not their fault and they cannot be held responsible for something that is sheer bad luck or a misfortune.

The above-mentioned risk matrix is very useful to monitor the risk pattern of any given business: It avoids surprises. It explains how financial risks can bankrupt a business operating in a good business environment with satisfactory growth potential, and vice-versa.



External Risks

Almost every one knows why *The Titanic* sank, in the cold waters of the Atlantic on a starlit night in 1912. The tragedy of *The Titanic* was the result of ignoring external threats. The ship was claimed to be unsinkable, which led to certain unconscious decisions on the part of people responsible for steering it, to ignore external threats from sea and weather. The information on an external risk—icebergs—was taken too lightly. The confidence reposed in the strength of the ship—the best ship till that date went to extreme lengths.

Similarly, in business, even strong enterprises and companies have floundered because of inadequate attention to external threats. The business history of several nations has stories about once mighty companies which disappeared due to changes in the external environment. In this chapter we will cover external risks, first among the three major operating risks. It refers to all those non-industry and non-entity factors that impact the operational and financial aspects of a business.

Businesses do not operate in a vacuum. Many external factors do influence the results, actions and decisions of businesses, although diverse businesses are impacted by varied external factors in dissimilar ways. While a government contractor may face a difficult situation because of delayed settlement of dues by the government, a restaurant chain will not be affected to the same extent. The real world is full of political, social, technological and other forces, which intermix and sometimes flow at cross currents. Identification of the major external risks and awareness about how major external variables impact the performance of the obligor is crucial for good credit risk analysis. Let us discuss 12 major sources of possible external risks that can give rise to a worrisome situation for a business entity.

5.1 BUSINESS CYCLE

An economy is not static, and undergoes different periods or stages of economic growth, widely known as business cycle. Even well-managed economies are not immune to this phenomenon. It is now considered an integral part of a dynamic, economic system, largely capitalistic in nature. It cannot be eliminated. But policymakers, with the indispensable aid of economists, have done much to tame the viciousness of downturns over the past 50 years. The ups and downs of a business cycle are depicted in Fig. 5.1.

As is evident from the graph, the economy goes through different stages—recession, trough, recovery and peak which are analysed below. The business cycle diagram resembles a mountain range. The difficulty in negotiating a business cycle and mountain range is almost identical—but with one possible exception. While descending from the peak can be an easy affair, in a business cycle that stage (recession) is really difficult.

Recession

In this stage of the cycle, economy activities slow down with rising unemployment, slowing sales and reducing corporate profits. Inflation and interest rates ought to have already risen (usually, not always) with business spending down and businessmen and



Fig. 5.1 A business cycle showing ups and downs of an economy over a period of time.

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corporate executives worrying about how to cut costs. Given the overall bleakness, investments are curtailed. Bankruptcies increase as weaker firms find it difficult to cope. All responsible governments try to meet the recessionary tendencies of the economy well in advance with appropriate monetary and fiscal actions. It is the widely held view that if the economic growth is negative in two quarters, the economy is in recession.

Trough

Things look like they are at their worst. High levels of unemployment, general gloom, lowest production levels in the recent history of the economy, bottomed stock market and bankruptcies of banks and other financial intermediaries due to heavy bad loans are some of the symptoms. There is a general feeling that things cannot get any worse. The trough for most of the Asian economies impacted by the currency-induced economic crisis, can be traced to 1998. Again, this phase can be shortened by appropriate actions by governments, either with or without the help of multilateral organizations, including the IMF.

Recovery

Things begin to look a little better, with business confidence returning and economic activity picking up. Stock prices and employment levels start rising while investments and profits increase. In the first half of an expansion, it appears that profits rise faster than wage because of the increasing productivity. Periodicals (monthly/quarterly, etc.) related to the economy are full of good news, reporting higher manufacturing growth, tertiary growth, less unemployment, less inventory level, more factory orders, and so on. Sometimes the recovery can be slow, but it can also be rapid as has been the case with the Far East Asian economies hit by the cycle in 1997.

Peak

The economy puts up very strong performance with low unemployment levels. Markets get heated up with price levels under pressure. Euphoric conditions prevail. Consumers over-extend their credit and spend heavily, assuming steady future cash

flows. Business magazines roar with positive headlines and many proponents emerge arguing that this time (peak period) things are different because of technology or otherwise and predict long-term further growth. Overconfident investments ventures are undertaken, creating overcapacity, bordering on high risk/low return business decisions. Non-vigilant financial intermediaries are also pulled into supporting these ventures. The ecstasy continues till a shock sets in, triggering a financial crisis culminating in a recession. Japan in the late 1980s, Far East Tiger economies in the mid-1990s, USA in the 2000s are some of the examples.

Benefits of Study of Business Cycles

Credit risk analysis should focus on the extent of the impact of the business cycles on obligors and assess their strengths to overcome the negative influences of cycles.

The study of business cycles is a powerful tool in the hands of the finance/credit executives. During recovery time, additional investments stimulate a lot of economic variables such as additional employment, demand for finance, creation of new assets, and so on. On the other hand, in a recession situation the business confidence erodes, resulting in poor performance of most of the business entities, impacting the credit risk adversely. While most business do well in economic growth (which can be linked to the recovery and boom phase in a business cycle), economic decline (recession/trough in the cycle) causes bankruptcies and credit losses. The majority of the business firms tend to do poorly in recession. Probably the only ones who thrive in a recession are scrap metal dealers and bankruptcy lawyers!

5.2 ECONOMIC CONDITIONS

Changes in the economy impact entire constituents, albeit in varying degrees. A growing economy with increased spending by consumers will result in accelerating demand, in turn encourage production expansion, creating more demand for factors of production, improving overall employment of resources. While the analyst need not be an economist, grasp of a few economic fundamentals is essential. One of the best ways to understand an economy is to study the national income (NI) or gross national product (GNP), usually expressed as:

$$Y = C + I + G + (X - M)$$
, where

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Y = National income C = Consumption I = Investment G = Government spending X = ExportsM = Imports

Private Consumption

This is the largest component in most economies. In India, it accounts for about twothirds of the economic activity, which is true of most other economies too, including the largest economy, the USA. What is the relevance of private consumption to external risks? Private consumption broadly includes all types of goods consumed by the general population, ranging from foodstuff, clothes, cars, washing machines, home computers, cosmetics, school items and kitchen utensils to costly interior decoration materials. Hence, changes in private consumption will definitely impact many businesses and hence is a risk in itself.

Given its importance, all responsible governments actively encourage the development of various types of consumer goods and expansion of the consumer market, through the budget and various other fiscal/monetary policies. Taxation policy, future expectations, income level and equality of income distribution are some of the factors influencing private consumption. Higher taxation and high levels of inequality are generally seen as suppressant of private consumption, while higher future expectations and income levels are considered triggers for enhancing consumption.

Government Spending

Governments spend not only on providing basic services such as law and order, defence, education and social welfare activities, but also endeavour to implement various infrastructure projects. Governments are usually concerned with agriculture, water conservancy, ecological environment and infrastructure projects such as railways, highways, telecommunication, power, and so on. While changes in government spending directly impact certain sectors such as government contractors, the overall impact is felt throughout the economy.

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Investment

This is one of the key economic activities in any nation and undertaken by both the private and public sector. Investment is usually done out of savings by various economic agents. When an economy cannot save enough to meet its various investment needs, it should seek foreign investment or development assistance from multilateral agencies such as the World Bank and Asian Development Bank. If the gap between investment and savings is funded through foreign borrowings, it casts obligations on the borrower—whether private sector and government—to service the debt on schedule.

Imports & Exports

While trade between nations dates back to thousands of years, it is Adam Smith, hailed as the Father of Economics, who stated that countries could benefit by mutual exchange—just as a tailor does not make his own shoes but exchanges a suit for shoes. Accordingly, an oil-rich desert country (Saudi Arabia, for example,) will exchange oil for rice, electronic items, automobiles, luxury goods, etc. David Ricardo's comparative advantage theory proposes that although two countries can produce the same items, they will be better off if they concentrate on items with lower opportunity costs and exchange them for items with higher opportunity cost to produce at home. Thus, international trade offers each country the benefit of specializing in the production of goods in which it has the comparative advantage and then exchanging them for something in which it has comparative disadvantage. Unless carefully managed, the changes herein can lead to foreign exchange problems, triggering economic crisis. This has been testified again and again by several economic crises in Latin America, Turkey, Far East Asia, etc. (Another related external risk factor, will be dealt with in detail later—viz. Balance of Payments.)

How to Link NI Components to the Firm

Coming back to the use of NI statistics for understanding operating risks facing a business concern, the analyst should attempt to identify the contribution of the particular business segment to the overall economy. For instance, let us suppose you are analysing a company engaged in the production of some kind of building materials (cement, concrete admixture, waterproofing materials, etc). It is beneficial to look at the contribution of the construction sector to the overall economy and the rate of growth in the past and that predicted in the near future.

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Components	1991	2001	1991	2001	
Private consumption (C)	156	255	53%	61%	
Govt. spending (G)	30	44	10%	10%	
Investments (I)	118	113	40%	27%	
Imports (Im)	90	171	30%	41%	
Exports (Ex)	81	181	27%	43%	
GDP (USD in Billion)	294	422	100%	100%	

Source: World Bank.com

Table 5.1 National Income Statistics of South Korea

Another way to look at NI figures is to determine the general direction in which the economy is moving. For instance, if there is heavy investment taking place in the economy, it may indicate higher industrial activity in the future either for internal consumption or for exports, which will have a boom effect in the economy. The analyst can see how the credit portfolio constituents are going to be impacted. The data in Table 5.1 extracted from South Korea is an example:

The benefits of deploying 40% of the GDP in investments in 1991 had a positive impact after ten years in 2001, notwithstanding forex crisis of 1997. While the exports (Ex) soared by 123% (CARR¹ > 12%) domestic consumption (C) increased by 63%. The cars, computers, televisions and other electronic items manufactured in South Korea were penetrating world markets. Viewed against the forex crisis of 1997/98, the improvement over a decade is remarkable. All businesses, including ancillary industries in the sectors that witnessed growth stood to benefit from the robust NI growth. However, on the flip side, it is to be noted that excessive investment creating surplus industrial capacity will do more harm than good. In fact, the South Korean chip and semiconductor industry was facing the problem of surplus capacity in 2002. We will look into the factors impacting an industry, in the next chapter.

Benefits of Study of National Income

Study of National Income (NI) components and linking them to the business entity, brings out relationships, highly useful to evaluate the credit risks involved. Let us discuss two of the important firm-level variables influenced by economic conditions:

¹ Compounded Annual Rate of Growth.

- a. **Revenue**: Improving consumption under economic growth will result in the increase in consumer goods, resulting in higher sales for the firms, products and services. This, in turn, will trigger demand for the intermediate and basic components, essential for the production of consumer products. Overall, the sales revenue will increase, translating into more profits for the businesses. On the other hand, in an economic recession or trough, the spending levels will touch lower levels, resulting in lower sales, which will lead to the collapse of weak businesses—those with internal flaws or bad structures.
- b. **Business Confidence**: If the demand continues to be strong and outstrip the current production level, business people may decide to expand their activities. Additional investments stimulate a lot of economic variables such as additional employment, demand for finance and creation of new assets. Higher level of investment activities, as we have seen earlier, brings in several advantages to the economy. On the other hand, in a recession situation, the business confidence slips, resulting in the cancellation of projects, which not only affects the individual firm's profitability but impacts the overall economy also.

Economic growth is defined as the rate of change in national income. NI can also be divided into three sectors—primary, secondary and tertiary. Per capita income is obtained by dividing the NI by the population. Increase in per capita income is the most commonly adopted measurement for gauging the standard of living. An in-depth study of these economic aspects is beneficial, which is why many companies having sizable credit portfolios appoint full-time economists on their payroll. They occupy the highest watchtower to warn about any impending dangers seen across the zone. In the absence of the support of an internal economist, credit risk professionals should depend on external sources, which should be vetted with the care necessary while relying on secondary sources.

5.3 INFLATION/DEFLATION

Changes in inflation, the term used to denote persistent increase in prices and measured by the consumer price index (CPI) and wholesale price index (WPI), is another trigger of external risks. Low levels of inflation, say around 5%, are considered as normal and good for businesses as they can lead to short-term gains—viz, they can earn more profits. Higher levels of inflation will result in economic problems, while hyperinflation (above 50% p.a) will lead to greater problems. It is to be noted that sudden

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increases in money supply, if not matched by a similar increase in goods and services, lead to inflation. Sudden increase in demand or costs, supply shocks, deficit financing and future expectations are some of the other factors that result in imbalance in the supply of goods and money.

The credit executive or banker cannot ignore the inflationary risk exposure of the obligor, mainly because of the following:

- Higher levels of inflation will persuade the central bank of the country to increase interest rates, which usually will—while other things remain the same—impact foreign exchange rates. Hence, a customer having substantial foreign exchange exposure is likely to be impacted accordingly.
- Higher interest rates will sharply eat into the profitability of a business relying on leverage. If the obligor is in a weak financial position with high operating risks or having internal structural defects, adverse credit risk migration is a highly likely scenario.
- Government attempts to reduce the inflationary pressures not just by controlling money supply but also through increasing taxation and reducing own expenditure.
- Higher levels of inflation will render domestic goods uncompetitive, which may lead to lower exports. For instance, suppose a dollar buys twenty units of product X. But due to inflationary pressures the cost of inputs increase and accordingly the producer of product X had to increase the price by 20%. At the new price the foreign buyer will be able to buy only 16.67 units of product X. So the foreign party may go to other competitive markets.

Inflation pushes up costs, which can wreak havoc on credit assets originating from customers with weak financial position. The real difficulties of hyper-inflation were experienced by many Latin American countries in the 1980s and Russia in the mid- 1990s. For example, Brazil witnessed an average annual inflation rate exceeding 900% during the late 1980s and early 1990s. Long-term planning was difficult while the businesses attempted to stretch the credit period from supplies while insisting on immediate payments from buyers/debtors. Interest rates were exorbitant as the central bank attempted to control the inflation. Such hyper-inflation not only required frequent price revisions but also influenced negotiations. Re-negotiations with suppliers and employees, which normally take place on an annual basis, were carried out on a monthly basis.

Before concluding the discussion on inflation risks, it is pertinent to mention that the creditor loses during inflation, even if he gets repaid on time. (See Chapter 1).

Another threat is where deflationary pressures cause sharp drop in price levels, putting businesses out of control. This is a situation where the majority of the goods and services produced have to be exchanged for lesser prices. Higher levels of deflation are as risky as inflation.

5.4 BALANCE OF PAYMENTS AND EXCHANGE RATES

The impact of imports and exports and other foreign transactions such as investment flows and services, are captured by the term 'balance of payments'. It measures how much a country has to pay to the rest of the world or vice versa. It is usually divided into two—capital account and current account. Capital account is usually smaller and consists of purchase/sale of assets, loan/gold transactions, investments, repatriation of capital/dividends and foreign aid, among others. (Some authorities divide the financial assets/liabilities movements into a separate category and classify it as financial account.) Current account, which is the largest component, comprises the trade in goods and services, repatriation of employee compensation, gifts, donations and so on. Risk lies in the management of balance of payments by governments, and it has a close link with foreign currency rates. This brings in another risk—volatility in foreign currency rates, which may be either fixed or floating. While in the case of floating exchange rates, the demand and supply of a currency determines the exchange rates, fixed rates are not allowed to freely move to the market's whims and fancies.

While the risk emanating from adverse balance of payments and resultant movements in foreign currency rates is systematic in nature, not all businesses are affected to the same extent. If the demand is 'price inelastic' (say, crude oil), the quantity sold will almost remain the same despite foreign exchange fluctuations, while in the case of a 'price-elastic' business, the impact will be greater. Generally, the impact of devaluation or appreciation has following effect on the businesses:

Devaluation:	Exports are incentivized;	Imports become dearer
Appreciation:	Exports become costly;	Imports become cheaper

It is the strategy of some export-oriented countries to devalue (or keep devalued) their currencies to sell more in overseas markets. In such instances, relevant monetary

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authorities sell locally whenever the currency appreciates beyond a certain level. Currency devaluation of competing nations can impact domestic industry. For instance, subsequent to the heavy devaluation of currencies of the Far East, in 1997-98 the hosiery industry in Tirupur (Tamil Nadu) was hit as overseas buyers began to source goods from Thailand and other Far East exporters. Similarly, the appreciation of the Euro in the early half of 2003 hurt exports from the region, forcing the European Central Bank (ECB) to slash the economic growth forecasts. However, as new equilibrium sets in with adjustments to the economy and other macro variables, life (business activities) will go on. A credit/finance executive is interested in understanding how life will be after the new equilibrium sets in.

5.5 POLITICAL

Business is impacted by political developments, regionally, nationally and internationally. Consequently, business decisions are influenced by both political stability and business-friendly policies of the political authorities. Some of the business risks directly emanating from political factors are confiscation, currency repatriation restrictions, limits to business transactions, and legal controls. Government changes and subsequent changes in policies may cause serious trouble for long-term plans of businesses. This is why political stability is rated high for attracting foreign investments. The second type of political risks is not directly linked to government actions but to political events caused by other vested interests. Examples are violence, terrorism, riots, guerrilla/civil wars, bandhs, hartals, etc. There are a number of political events and constraints, which will eventually cause a loss or harm to a business operating in a foreign environment.

Uncertainty in political situations will dampen investments and other spending, which in turn has its own economic consequences. For instance, during the post 9/11 period, due to terrorism fears, air-travel dropped sharply, causing problems for the US airline industry, forcing some players into bankruptcy.

5.6 FISCAL POLICY

The government uses fiscal tools such as direct and indirect taxation, surcharges, disinvestments, levies, duties and tariffs to raise government revenue, while government spending includes both routine and planned/unplanned expenditures. The manner in which the government decides to raise resources and spend has business risk implications. In India, Central and State annual budgets are closely watched as they provide a fair idea

about government revenues and expenses and extent of deficits. Business risks emanating from both direct and indirect fiscal policies can sometimes be quite significant. For instance, if income-tax levels are increased, the disposal income will be lower, impacting certain categories—mostly luxury or durable goods—of businesses. Lowering of import tariffs, due to globalization pressure or otherwise, is yet another instance of business risk emerging from fiscal measures. In India, many toy manufacturers suffered and some even wound up business following the flood of cheaper Chinese imports, after the liberalization of import tariffs in 2002.

5.7 MONETARY POLICY

The government, usually through the central bank of the nation, attempts to control the money supply in the economy to achieve various goals such as stability in price levels and foreign exchange rates, conducive economic atmosphere for growth, among others. Changes in interest rates, forex controls, buying and selling of treasury securities are some of the main tools used by central banks to achieve the desired money level in the economy. Interest rates are generally kept high to ward off inflationary pressures or neutralize higher demand or to attract foreign investment (in securities), among others. Operating risks emanating from the monetary policies pursued by central banks are far-reaching. For instance, in India, during early the 1980s most businesses found it difficult to source adequate credit from banks because of the strict credit norms prevailing then. Similarly, high interest regime is yet another risky period, as Demand falls as economic agents become reluctant to buy with borrowings that result in higher expenses. While almost all businesses feel the impact, those which directly rely on cheap financing such as instalment financers etc., may get a bigger jolt.

Interest rates have not only an operational angle, but a financial one as well. It should be noted that when interest rates move from 5% to 7.5% the rates have not only increased by 2.5%, but the additional financial burden in absolute terms goes up by 50%! Awareness of the current monetary policies and likelihood of its continuation, together with the ability to gauge the impact on the businesses, enable a credit professional to unearth some of the significant operating risks facing a borrower.

5.8 DEMOGRAPHIC FACTORS

Population structure and composition have immense significance for businesses because it determines most of the ultimate market. Some of its main elements are outlined below:

- Young generation with purchasing power means good times for youth-oriented businesses, including sports cars, fancy two-wheelers, fashionable clothes, sportswear, latest shoes, etc.
- Ageing population on the other hand may require more health care and pension support.
- Religion determines the festivals and ceremonies associated with it, which is a good business season for most consumer goods, with knock-on effect on the whole economy.
- Similarly, ethnic mixes and their customs and celebrations provide unique business opportunities.
- The level of education matters too. Generally, the demand of the educated population differs from that of the uneducated, with the former's better awareness translating into more demand, including that for knowledge-related items.
- Working women in the population mean potential business for fast-cook items, time-saving household equipments, etc.
- Culture patterns determine dress codes, fashion, style, entertainment type and so on, and thus influence businesses.

Almost all businesses are impacted by demographic factors, which bring both opportunities and risks. The population can be further divided into vegetarians/non-vegetarians, joggers, holidaymakers, smokers/non-smokers, teetotalers, married/un-married, children (infants, school-going or college-going), heart patients, diabetics and so on, depending upon the suitability to the nature of activity/business under study. For example change in food habits impacted the fast food business in the US as consumers shunned fatty burgers in 2002/03 and the preference for carbonated drinks among the young population in India has spelt some trouble for the tea industry.

5.9 REGULATORY FRAMEWORK

The number of regulations imposed on business and penalties for non-compliance is another source of potential operating risks. For instance, it is stated that in India, there are so much regulations by Central and State governments such that each small/ medium/large entity can expect one inspector (to check compliance with regulations under respective statute/law) every alternate day! This can be either from Customs, income-tax, excise or sales tax or inspections under the Factories Act, Industries Dispute Act, Companies Act and similar legal enactments, or from environmental agencies,

municipal authorities, crime investigation authorities and so on. Besides, in order to carry on your business, you may require a lot of sanctions, permissions and licences from a host of government authorities. While regulations are inevitable, excessive regulations will dampen risk-taking and encourage corrupt practices. A general look at the direction in which regulations are operating can indicate the potential operating risks emanating there-from. The credit executive should determine whether such risks can really be weakening or delibilitating.

Additionally, a proper and effective legal system goes a long way in ensuring business confidence and hence provides a suitable business environment where businesses can flourish. Absence of a good legal system or inordinate delays in getting legal redressal are potential operating risks, especially if significant disputes or legal issues threaten to emerge from business activities.

5.10 TECHNOLOGY

One of the main features of the twentieth century was the vast new technologies developed, a trend which is expected to be continued more voraciously in the twenty-first century as well. If you are lucky to be alive and able to check after 50 or even 25 years from now, you will see most of the so-called advanced technologies of today getting classified as outdated then! Whilst internal R&D of businesses can come out with new ideas and technologies, the risk is that someone else might be developing a better one! Or the cost of production under current production technology may turn out to be more because the new technology may need less inputs or lower process time resulting in lower cost of production or better quality products. Nowadays technology is considered a very vital source of operating risk and most of the project-financing institutions insist on independent technology evaluation reports while assessing credit applications.

5.11 UNION INVOLVEMENT

Skilled and non-skilled workforce is inevitable for all kinds of organized human activity, be it business or non-business. Establishing a union and negotiating/bargaining/striking, etc for improved employment conditions is an accepted phenomenon in most countries. Exceptions can be found in certain countries in the Middle-East, etc. Too much unionism, disregarding business realties, is an operating risk as it will may lead to financial/operating difficulties (constant strikes, disruption of production, lower employee productivity, etc), which will ultimately end up in closure of business. For instance, Kerala is generally seen

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as having heavy union activism, which dampens investments despite it being the highest literate state in India. It is stated that the closure of certain business units such as Premier Tyres, was because of militant unions. Multi-location business units, production facilities, ability to identify and retain good staff, educating unions, etc, are some of the effective mitigants for this risk, as has been proved by several successful businesses operating in Kerala.

5.12 INTERNATIONAL DEVELOPMENTS

In this ever-shrinking world, events in other countries can sometimes have far-reaching consequences in businesses operating in another part of the world as well. The best instance is the post-Sept 11 2001 consequences in the US, which had an adverse impact on the software industry in India, although it recovered somewhat by late 2003.

The above list, while it covers most of the important sources of operating risks from the external environment is not all inclusive, given its dynamic nature. Different geographical locations can throwup varied external risks such as earthquakes, floods, etc. Inherent strengths and wise business strategies can nullify or reduce the impact of external risks. This is the hallmark of good business management.

Another aspect to be borne in mind is that most of the external variables discussed above are sources not only of operating risks but also of opportunities. For instance, changes in demographic/social factors, recovery phase of business cycle, etc, provide a host of business opportunities to grow, expand and diversify. Finally, the external variables are often interlinked. While economic problems can lead to political instability as has been the case with Argentina in 2002/03 where three Presidents were changed in a span of one year, some of the African countries' economies, despite their mineral wealth, often fail to achieve momentum due to civil strife. Also note that business cycles, national income, monetary and fiscal policies, are close cousins. Changes in one can trouble others as well.

Exercise: Read any business daily for ten days and mark down the major external risks discussed in the newspaper. You may link such external risk to a business entity/company you are familiar with.



Industry Risks

Once upon a time, the clicking sound of typewriters was the hallmark of any office. Nowadays, the traditional typewriter is found in very few offices. The typewriter industry, which once prospered, has been eclipsed by the computer industry. The pager industry, once hailed as a path-breaking new technology, is now almost non-existent, with the advent of the more versatile mobile phones. The asbestos industry, especially in the USA, is also gone, with many companies in it now bankrupt/liquidated/under liquidation. Companies, with exposure to the asbestos industry in the past, are fighting a debilitating litigation battle against product liabilities, caused by injuries from exposure to asbestos. The best example is Halliburton Company (HC), which, although one of the largest oil field suppliers in the world, is paying for having subsidiaries engaged in the asbestos industry. The number of open claims against HC stood at 3,47,000 as on 31.12.02 on which date its audited balance sheet reflected related liability of USD 3.4 billion (\simeq Rs.17,000 crore) with HC suffering a net loss of USD one billion, due to the provisioning for the estimated liability for asbestos claims being one of the main reasons. Another global giant reeling under asbestos litigation is the Zurich-based ABB.

Industries decline and vanish, taking the participants with them. Hence, industry analysis is an indispensable part of credit risk analysis. The life stage, composition, nature, characteristics and structure of an industry are to be studied to find answers to the following points that intrigue a credit executive:

- 1. Why does profitability differ among various industries?
- 2. What are the reasons for consistency in profitability in certain industries while others show wide fluctuations?

- 3. How do operating risks differ from one industry to another?
- 4. What are the implications of industry risks?
- 5. What are the forces determining the level of competition in an industry?
- 6. Will an industry that performed well in one time period continue to do well in future?

An industry analysis shows how diverse and different forces act on an industry, impacting its survival and profitability, and indicates the fate of the players in it. If the industry profitability is low, it is very unlikely that the participants or players in the industry will enjoy high profitability. Given the fact that profitability is vital for the survival of a business unit, insight into the various risk factors impacting the industry and key profit drivers acts as a powerful tool for studying the creditworthiness of firms in it.

6.1 TYPES OF INDUSTRY RISKS

Before getting down to the details of industry analysis, it is better to bifurcate the operating risks as follows:

a. Risks emanating from external environment: This type of industry risk originates from the changes taking place in the overall exterior system. For instance, suppose the government decides to lower import tariffs, leading to cheaper imports from foreign producers: This impacts the overall industry profitability as the cheaper imports force the industry players to reduce prices, which will reduce industry profitability. In this era of globalization many industries in India and other countries relying on protection tariff barriers remain worried. Change in consumer preferences (e.g., moving away from fat-rich Burgers) is hurting the fast food industry, especially in the US and Europe. Consequently, industry majors such as McDonalds and Burger King are suffering, with McDonalds—once the darling of the investing community—slipping into loss in FY2002.

b. **Industry-specific risks**: These are risks that are confined to an industry, with the source of the risk lying within the industry. One example would be new entrants causing fierce competition, leading to retaliation from existing players in the industry, resulting in price-wars, lowering profitability.

6.2 DEFINING AN INDUSTRY

The problem of including a business entity in a particular industry is a demanding job. Although it can be easy in certain cases, there are many instances where the ideal
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industrial classification can have more than a single option. While it is easy to categorize commercial aircraft manufacturers, where do we include the manufacturers of plastic cans? Do they come under the can industry? Or the packaging industry? Or, plastic industry? Or petrochemical industry? Correct classification of an industry is very vital, and adequate care should be taken to ensure correct industry categorization. (Readers may refer to business dailies and compare their industry classifications.) Understanding major competitors of a business unit can be a good criterion for proper classification of it in an industry.

6.3 INDUSTRY LIFE CYCLE

Just as a human being moves from birth to adolescence to youth to middle age and to old age, the life of an industry can be captured by a five-stage model. However, unlike human beings, certain types of industries enjoy a life cycle spanning centuries—shipping, insurance, banking, railways, etc.,—Proper industrial classification and a sound understanding of the stage through which the industry is passing through are essential. Fig. 6.1 throws more light on this concept.



Fig. 6.1 Industry life cycle through five different stages.

Let us examine the five stages in the life of an industry in some detail.

1. **Pioneering stage**: During this phase, the industry faces an uncertain future with modest sales growth, as the market for products of the industry is small. Markets are to be developed while prospective beneficiaries of the products are to be informed and educated. The removal of initial apprehensions/hesitations is yet another aspect of this stage. Evidently the operating risks associated with this stage are immensely high, with associated doubtful or little profitability and low sales.

2. **Rapid growth stage**: Once the industry passes through the pioneering stage successfully, the next stage is characterized by increasing demand, accelerating sales and high profitability. The market is established, with substantial demand for its products. With the number of players in the industry being limited, there is little competition, and the increasing market ensures considerable business. Production capacities are rapidly enhanced to meet the increasing demand. The industry operating risks are low at this stage as sales and profits grow at over 50% (or even 100%) a year! The Indian software industry witnessed this level of growth during the late 1990s.

3. Maturity growth: At this stage, the sharp growth in sales and profits vanishes as the demand slackens with a steady pattern emerging. Attracted by the success of the few players in the growth stage, many new entrants emerge in the industry, which also causes the profitability to drop to normal levels. Sales growth remains above the economy growth rate, but no longer accelerates. The Indian software industry is in the early phases of this stage, at present. Industry operating risks, although relatively on the lower side, can be steadily on the increase as the industry moves on to the next phase.

4. Stabilization: In this stage, which is probably the longest phase, the industry growth is almost identical to that of the economy or the sector of the economy of which the industry is a part. While the sales move more or less in tandem with the economy, the profits of the individual firms in the industry vary depending upon the management capabilities. Depending upon the barriers of entry, the intensity of competition varies, while the profit margins and rates of return on capital of individual firms eventually become more or less equal. Firms in the industry that earn better than industry profitability at this stage, ought to have distinct sustainable competitive advantages, which will be discussed in the next chapter.

5. **Decline (and Death)**: The demand moves away from the industry and the sales declines. Better and new substitutes, changes in consumer tastes and choices, and new technologies are some of the reasons for the decline and demise of industries. While

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cassette players spelt the doom of gramophones, computers pushed out the punched card industry into oblivion. Horse-driven carriages vs. automobiles and pagers vs. mobile phones are two other examples. Evidently, operating risks at this stage tend to be on the higher side.

The industry life cycle has a powerful link to the overall growth pattern and establishes the operating risk levels. Generally speaking, while the growth to stabilization stage can be considered to be low/moderate risk stages, the introduction and decline stage are high-risk categories.

6.4 PERMANENCE OF INDUSTRY

Another useful concept in understanding industry-level risks is assessing its permanence. Industrial profitability pales into insignificance if its life is short. Similarly, an industry in the last stages of its life cycle also has less permanence. In fact, the life cycle of an industry and permanence are related in certain aspects. If the life cycle of an industry is very short, it denotes lack of permanence. Most of the fashion-related industries display this phenomenon.

Another instance is where external risks act upon the life cycle so that the industry's permanence (in the local economy) gets affected. For example, due to the strict environmental laws in developed nations many chemical related industries are shifted to developing nations. Reduction in protection by local governments may cause the demise of certain industries because of cheaper imports from countries having comparative advantages. For instance, the ship breaking industry has been shifted to countries with lower labour costs. Permanence of industry and its relative importance in the local economy should to be studied as part of credit risk analysis.

Having credit exposures to industries which are on the decline or under phase-out, involves high risk, which should be avoided unless strong mitigants are present. In today's world of rapid changes, especially in technology, the permanence of an industry is of vital importance.

6.5 GOVERNMENT ATTITUDE AND INDUSTRY

The priorities of the government do affect the industry. While governments actively protect and encourage certain industries, other industries might be facing discouragement

and no protection at all. Some industries might be treated with apathy with no signs of favour or disfavour from the government. Central/State and other government authorities have different interests in adopting such policies. During the pre-independence period, most of the rulers generally did not encourage any industry. In the immediate post-independence period, encouragement to industries was the official policy, while the threat of nationalization and licence raj had a stifling effect. Following liberalization and scrapping of the licence raj in the early 1990s, a certain dynamism is visible in various Indian industries. Certain countries such as Japan, Korea and other East Asian national governments are active supporters of industries, especially those with significant export potential.

The second tier of government preference is with regard to specific industries. While the general attitude of the government to overall industry (nationalization, liberalization, etc) is important, specific industry-driven policies are vital. Most governments are against the tobacco industry and devise policies discouraging smoking and other forms of tobacco consumption. In certain countries the liquor industry is banned. On certain occasions the government comes forward to support industries. Soon after 9/11, the US government came out with a package worth billions of dollars to keep the airline industry in the US afloat. The credit executives is concerned with both general and specific policies of the government to gauge operating risks.

Another category of operating risks emanates from the actions of foreign governments. This is akin to international developments which we discussed in the previous chapter. A recent example is the impact on the global steel industry by the US government's decision to increase steel import tariffs in 2001-02. This caused worldwide increases in steel prices. Similarly, anti-dumping policies, actions under the quota system, etc, result in problems in the industry.

6.6 FACTORS OF PRODUCTION & INDUSTRY

Land (natural endowments), labour, capital and entrepreneurship are the classic concepts of factors of production, which now stand slightly modified to money, man, machines, material, and management. Risks related to the factors of production are very vital as they dictate competitiveness, especially on a global scale. Natural advantages such as proximity to raw material may affect the success of an industry in a particular country or area while labour conditions may be the success factor of another industry in another country. Of the factors of production, capital or money is highly

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mobile, especially in recent times, thanks to globalization. While China is accepted as one of the countries with cheap labour, India is well known for its software professionals. Similarly, petroleum and petrochemical industries flourish in the Middle-East due to the natural endowments such as oil and gas. Entrepreneurship is at its highest in the markets of capitalist economies, where profits drive individuals of certain abilities to take the lead and attempt calculated risks. Japanese labour productivity is among the highest in the world, ensuring global leadership in several industries. Lack or absence of favourable factors of production is a source of industry-related operating risk.

6.7 BUSINESS CYCLES AND INDUSTRY

We have seen that business cycles are one of the sources of external risks. But a further close look from the industry context is necessary because different industries display dissimilar patterns during business cycles. While certain industries such as the food industry are not at all impacted by cycles, others like chemical industries and construction-related industries move in tandem with business cycles and are generally known as cyclical industries. Some industries are even classified as counter-cyclical, which means the demand goes up when other industries are declining or hitting the rock bottom in cycles. A study of the trends that cover at least one full business cycle (say around ten years) will show the extent of the cyclical nature of the industry. Broadly speaking, higher the cycle-orientation, the higher the operating risk. Firms in such industries should have mitigants such as strong finance structure, capable management having ample experience in taking the business through troubled waters, low operating and financial leverage and strong shareholders, among others. Otherwise, by the time the next recovery phase happens, the business firm may not be there to reap the benefits.

6.8 INDUSTRY PROFITABILITY

In order to study and understand a firm's profit and cash generation capacity, a credit executive should first of all assess the potential of the industry. The profitability of various industries differs systematically and predictably over a period of time. It is the intensity of competition that determines the potential of an industry together with the following four other forces (known as Five Forces Model or Porter's Model, called after Prof. Michael Porter of Harvard University, who introduced the concept in 1980s), depicted in Fig. 6.2.



Fig. 6.2 Five Forces Model or Porter's Model

Competition among the existing firms within the industry

While there is cut-throat price competition in certain industries to attract and retain customers, others compete on non-price factors, including but not limited to after-sales service, brand image, etc. The main factors determining the intensity of competition among rivals within an industry are:

i. Industry growth rate: The higher the growth rate, the lower the competition, as the space constantly increases enabling the accommodation of all players in the industry. Accordingly, there is no need to try to grab market share from others. On the other hand, if the industry growth trend is negative, players would attempt to grab market share from others by pursuing aggresive competition tactics/strategies.

ii. Number of rivals: If the rivals are few, like in the case of oligopoly, an implicit understanding or rules of competition may be laid down to restrict competition. The best examples are that of cola giants, Pepsi and Coke and petroleum distributing companies—OIC, BPCL & HPCL—in India. However, on the other hand if the number of players is numerous, the competition tends to be severe.

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iii. Differentiation: If the products are differentiated by means of branding or by other means, the competition tends to be lower as each player in the field has developed or created its own target segment. For e.g. whilst Lifebuoy (bath soap) is targeted at the lower or middle-class, Dove is aimed at the upper end of the market. While Toyota cars are mainly aimed at the middle-income group, BMW focuses on and produces cars for the upper class. Differentiation by market segment, quality, image and other means can be observed in most of the consumer-oriented industries. (*See next chapter for more on differentiation strategy*). The ultimate aim of differentiation is to lessen competition by having a captive or loyal market. On the other hand, if the product is such that differentiation is impossible (viz. commodity type), prices generally determine the business, and accordingly price competition is intense. Examples are agricultural products and other unbranded items.

iv. Switch costs: If the switching costs are higher, the competition tends to be lower as the consumer would prefer the same product to avoid higher switching costs. On the other hand if the switch costs are lower, the competition is tough. While in industrial intermediary products and capital goods the switch costs are high, persuading the buyer to rely on the same source repeatedly, switch costs in consumer goods tend to be lower, which the manufacturers attempt to overcome by differentiation.

v. Level of fixed costs and overcapacity: If both are on the higher side, the producer would aim at higher output in an attempt to reduce fixed cost per unit, and the resultant excess supply in the market is sure to heat up the competition.

vi. Exit barriers: If the exit barriers are low, some of the marginal players may quit the industry without much loss to stakeholders, especially shareholders. If the exit barriers are high, the marginal players will continue, adding to the competition in the industry.

Threat of new entrants

The ease with which a new player can enter the industry is one of the main factors affecting profitability. If new entrants cannot enter the field despite attractive or abnormal profits in the industry, the existing players can be assured of a predictable and sustainable profitability. On the other hand, if new players can easily enter the industry, the attractiveness of the industry would disappear, as more firms vie for market share. So, higher the entry barriers, the better for the existing players. The barriers are usually determined by the following:

i. Economies of scale: Large economies of scale act as a barrier for a new entrant because the new entrant, to compete effectively on a similar scale, should invest heavily.

The new entrant may lack capital or may not attempt to risk failure by building up capacity below the optimum size. Economies of scale emanate in various forms—huge production capacity (Bajaj in scooter manufacturing), brand image (soft drink industry), substantial investment in property and equipment (tele-communications), etc.

ii. First-mover advantage: Early entrants or pioneers in the industry can dominate the industry in such a way that a new entrant cannot pose a direct challenge to the first mover. The best example is Microsoft in the household software segment. In other industries, the first mover might have tied up all the raw material supply or might have established close connections with the suppliers and other key counterparts of the industry. For e.g., most of the oil and gas concessions for fossil fuels in the Middle-East are controlled by American oil giants, because of the first-mover advantage.

iii. Channels of distribution and relationships: High cost of developing new channels can be an effective entry barrier. Sometimes the existing strong relationships among the customers in an industry makes it difficult for new entrants. Examples of this kind include auditing, investment banking, advertising, etc.

iv. Legal Barriers: Aspects like licensing, patents, copyrights, etc, act as effective barriers.

Threat of substitute products

If substitute products are available, then the industry profitability is affected by the factors influencing the substitutes. If tea and coffee are substitutes, the suppliers of coffee cannot increase the price beyond an extent as the consumers will prefer tea. Thus the competition from tea would affect the demand and profitability of coffee. Railways and other means of land transportation are substitutes, and it is common in India to see people use the substitute facility more when rates are increased in one type of transportation. Over long distances, railways and airlines are substitutes. As far as entertainment is concerned, films and TV serials and theme parks are substitutes. Ultimately, the threat from substitutes is directed by (a) relative price (b) relative performance or the satisfying ability and (c) customers' willingness to pay for the substitute. These differ from industry to industry. Usually, if both products serve identical functions, price would be the key determinant of choice. If one product offers more efficiency, the consumer may be willing to pay more.

Bargaining Power of Buyers

Industrial profitability is influenced by the customers' bargaining power. In case the buyers have substantial bargaining power—as automobile manufacturers have with spare part suppliers or computer assemblers vis-a-vis vendors—then the industrial profitability is somewhat hampered. On the other hand, if the buyers are fragmented they do not command any bargaining power. Broadly, it is as per Table 6.1.

Bargaining Power of Suppliers

As in the case of buyers, suppliers also determine industrial profitability, depending upon the extent of their influence. If the suppliers have substantial bargaining power as Coke & Pepsi have with bottlers—then the bottlers' profitability is somewhat hampered. On the other hand, if the suppliers are fragmented, they do not have any bargaining power. Broadly, it is as per Table 6.2.

The 'five forces' model, if effectively used, is a strong tool to understand the industry and its profitability. However, it is important to take a combined view of all factors. As is evident from the illustration given at the end of the chapter, while one factor may be favourable, another might impact the profitability adversely.

Details	Yes	No
Price sensitivity to the buyer	BP exists	No BP
High % of total cost of the buyer	BP exists	No BP
Is product bought differentiated?	No BP	BP exists
Is quality of product important?	No BP	BP exists
—Are buyers fragmented?	No BP	BP exists
—Is volume bought high?	BP exists	No BP
—Are there several alternatives?	BP exists	No BP
—Backward integration possible?	BP exists	No BP

 Table 6.1 Main factors determining bargaining power of buyers.

Details	Yes	No
Large % of total sales to a few buyers?	No BP	BP exists
Is product sold differentiated?	BP exists	No BP
Is quality of product important?	BP exists	No BP
Are the No. of sellers high?	No BP	BP exists
Are there several alternatives?	No BP	BP exists
Is forward integration possible?	BP exists	No BP

 Table 6.2 Main factors that determine BP of a seller.

6.9 COMPETITOR ANALYSIS

In an industry that has several players, it is better to take a look at what others are doing. A competitor analysis highlights the strengths and opportunities in the 'rest of the field'. Competitor analysis within the industry analysis framework is highly useful because the credit executive can determine whether the credit exposure is taken in a superior company from a good industry. Competitor analysis focuses mainly on the current capacities, level of business operations and strengths and strategies of the competitors, while assessing the likely responses of other players' manoeuvres and level of satisfaction with their current position, among others. By selecting the best companies within an industry with good track record, risk can be mitigated. In fact, it is the policy of certain ultra-conservative financial/lending institutions to take exposure with the top two players in any particular industry.

The techniques mentioned above will enable one to determine the industry attractiveness and risk factors. Again, the operating risk factors emanating from the industry factors need not be considered as serious if appropriate mitigants are available and the firm has the capacity and willingness to bring in alleviative measures. For instance, industries using inflammable raw materials (such as bitumen) carry a very high risk of fire compared to other industries. While one can insure the factory and profits (loss of profits policy), additional precautions such as storing inflammable materials in a separate warehouse, locating the factory far enough from such warehouses, etc, are effective mitigants.

ILLUSTRATION

Mr. Kumar, a newly appointed Credit Executive with ABC Corporation has been asked by the Director of Finance & Credit to prepare an industry profitability study of the global oil industry, to be submitted at the next board meeting in connection with certain critical strategic investment/ credit decisions. The report, prepared by Kumar, is given below, which you are requested to review critically.

Analysis Of Global Oil Industry

I. Definition of Global Oil Industry

Our first task is to get focused in order to analyze the industry in terms of Porter's Model. It is critical that the precise industry sector is always accurately determined, especially before commencing the analysis of each force in Porter's Model, because each of them may have different ramifications depending upon the component of the industry considered. A focused definition of the global oil industry might be 'design, exploration, extraction, production, refining and marketing of hydrocarbon fuels of different categories spread over and having presence in many countries.'

The global oil industry is dominated by a few major players, namely Exxon Mobil, Royal Dutch/Shell, British Petroleum (BP), TotalFinaElf and Chevron-Texaco. While other oil companies also exist in the market engaged either in the full chain—from extraction to marketing—or some part of it, they are mostly localized and small in size compared to the big five. It is believed that more than 75% of the total market share in the global oil industry is dominated by these five major companies.

II. Life Cycle of Global Oil Industry

The origins and introduction stage can be traced back to the mid 1850s in the USA, when oil drilling started on a commercial scale. While initially the fuel was mainly used as lighting and heating oil, with the advent of internal combustion technology resulting in a new era of automobiles and with coal-fired ships giving way to efficient oil-powered ones, the growth stage set in. Given the reality that crude oil is the single most important international natural resource driving the economies of world, the present stage can be stated as maturity growth phase. Although there are times of occasional drop in demand (e.g. aftermath of 1997 Asian crisis), the long-term trend is upwards.

III. Structural Analysis of the Oil Industry A. Barriers of entry

Barriers, such as access to large capital resources, cutting-edge technology and firstmover advantage in areas of proven oil reserves, exist. Substantial CAPEX is required to enter almost all downstream and upstream activities i.e. extraction, exploring, transportation, refining, distribution and marketing of refined products. Setting up sites for exploitation and refining is expensive, while the transportation/distribution of different oil products implies heavy investment in special vehicles-tankers, vehicle fleet, storage tanks and pipelines. New entrants will have to compete in all activities of the supply chain since the oil industry is driven by efficiency in handling risks such as blowouts, etc. Besides, most of the oil majors have formidable economies of scale built over decades, which is very difficult for any new entrant to replicate. Another significant entry barrier reducing new entrants is the technology. Another factor is the first-mover advantage enjoyed by the incumbents in the industry as they hold access to most of the proven oil reserves in the world, through concessions or otherwise. The relation of oil companies with the countries which own the property rights to oil reserves is also crucial. It has a political angle as well. It is evident that these countries will allow only companies from certain preferred countries. Since most of proven oil reserves are in the Middle-East, Mexico, Venezuela and a number of republics in the former Soviet Union, their political preference can also be considered as a barrier. Let us summarize the major barriers and their effect on industry profitability.

Particulars

Effect on profitability Economies of scale Positive Neutral (also see Bargaining power of buyers) Differentiation/Switching costs Capital requirements Positive Positive Property rights from oil-rich nations Technology Positive Positive Access to distribution channels

As most of the six determinants are working to increase the barriers of entry, a FULL STAR for this force because of its positive impact on retaining/ enhancing the industry profitability.

B. Substitutes

Hydrocarbons (oil), nuclear, coal, hydro and renewable (such as wind, solar, biomass, etc.) energy sources offer a choice to consumers. However, the limitations of the

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substitutes are among the strengths of hydrocarbon fuels. While coal and the nuclear option offer a strong challenge as a source of energy in certain areas (production of electricity, etc) they cannot replace oil and gas in all fields, e.g. transportation is a field where these kinds of energy cannot be utilized. Hydro-energy is also geographyspecific and limited, and primarily used for electricity generation and does not enjoy the flexibility/range of uses of oil and gas. As far as renewables are concerned, they are in the early and encumbered development stages, and wherever the products are available, the price becomes an issue since these products still have relatively high production costs. The best example is the solar energy cells, the core for solar-energy related products. Another issue is the availability: not all sources of energy are available in all places. The oil and gas industry has an extensive world-wide distribution network, which cannot be claimed by any of its substitutes—except coal, which has other limitations. It is long time since King Coal (1800s and early 1900s) abdicated in favour of King Oil (since 1930s). An additional factor is the considerable switching costs—for instance adaptation of machines, contracts with new suppliers, etc. In view of these factors, the substitute products do not pose any significant threat to the oil industry for the time being. Let us summarize the impact of substitutes on industry profitability.

Particulars	Impact/Response	Effect on profitability
Substitutes that perform same function	Almost non-existent	Positive
Substitutes that reduce cost	Almost non-existent	Positive
Substitutes that provide better quality	Nuclear—but dangerous	Positive
Consumer perception	Favourable, no alternative	Positive
Price of the perceived substitute	Solar, Nuclear—High	Positive

Again, a FULL STAR for this force because of its positive impact on retaining/ enhancing the industry profitability.

C. Intensity of competition

The intensity of rivalry among the incumbents is not low but can be considered as moderate because the industry space is increasing, driven by the world's economic growth along with the rising global population. Besides, they normally respect the others' markets. As we have seen, threat of new entrants on any significant scale is absent because of the entry barriers. Since all five companies are vertically integrated to a wide extent, rivalry exists in all activities that they engage in. While the intensity of

rivalry is moderate, the major corporations are interested in gaining larger market share and increasing profits, which led to the recent consolidation trend initiated in 1998. Let us summarize the impact of competition on industry profitability.

Particulars	Impact/Response	Effect on profitability
Number & size of competitors	Reduced with consolidation	Positive
Rate of growth in the industry	Maturity growth	Positive
Augmentation of oil reserves	Depleting supplies	Negative
Exit barriers Surplus capacity	High Not significant	Negative Positive

In view of the above, this force is rated at HALF STAR.

D. Bargaining power of suppliers

Suppliers' bargaining power is one of the key factors shaping not only the oil industry, but may be the world as such. Hydrocarbon fuels are a scarce resource concentrated in a few areas, mainly in the Middle-East/erstwhile Soviet Union republics. The countries that own the property rights of crude oil reserves enjoy great bargaining power as they sell the rights for extracting oil. Oil prices are very much determined by these nations, eg. OPEC, whose production cuts generally drive prices up. Suppliers also include the supporting and related industries supplying computer equipment, software tools, service for oil exploration and production, data management and mapping, software for pumping and pipe flow design, pipe network analysis and many other technical solutions. However, these suppliers, unlike the nations with oil reserves, do not have much bargaining power, given the availability of alternative sources. There is no real threat of forward integration, especially by oil-rich supplier countries, given the entry barriers and the size and power of the oil companies present in the industry. Let us summarize the impact of bargaining power of suppliers on industry profitability.

Particulars

No. of sellers/supply sources Price sensitivity to the sellers % of total sales of the seller Impact/Response

A Few—e.g. OPEC High (OPEC quotas) Significant^{*} Effect on profitability Negative

Negative Neutral

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Is product bought differentiated?	Not much—Commodity	Positive
Volume bought	Significant [#]	Positive
Forward integration	Negligible	Positive

* Some countries main source of revenue is sale of oil. They cannot live without it.

* Offtake of large quantities for several decades resulted in a time-tested bond with supplier countries.

In view of the above, this force is rated at HALF STAR.

E. Bargaining power of buyers

Buyers come from an extremely broad range, and the ultimate buyers extend from individuals (such as vehicle owners) to large corporate customers engaged in an assortment of business activities. Oil is an inelastic product and an absolute necessity in the modern world, which substantially limits the bargaining power of buyers. Oil importing nations have to continue the imports, irrespective of high prices. Otherwise, economic activities will come to a halt. Despite the importance of oil, it is a commodity-homogeneous product—making it difficult for the integrated oil companies to differentiate in any significant manner, especially in the retail business (service stations). Perhaps this is the only factor that gives the buyer some leverage, meaning that it is not too difficult to switch between suppliers within the oil industry. Demand from buyers fluctuates based on the economic conditions impacting the performance of industries around the globe. In periods of recession, an industry will save energy because of lower production, and vice-versa. These limitations are almost overcome by the lack of viable substitutes. In fact, the world practically runs on oil. There is no real threat of backward integration since the entry barriers are difficult to overcome and given the size and power of the oil companies present in the industry. Let us summarize the impact of the bargaining power of buyers on the industry profitability.

Particulars	Impact/Response	Effect on profitability
No. of buyers	Very Large (No BP)	Positive
Price sensitivity to the buyers	Inelastic (No BP)	Positive
Is product bought	Not much—Commodity	Neutral
differentiated?		
Volume bought	Essential commodity	Positive
Backward integration	Negligible	Positive

Again a FULL STAR for this force because of its positive impact on retaining/ enhancing the industry profitability.

Conclusion

The overall industry rating can be summarized as Four-Star. Some may ask whether given the bargaining power of the significant category of suppliers—OPEC etc.,—the force 'Bargaining power of suppliers' should be assigned any star at all. In that case the rating may be considered as three and a half, still an attractive rating, indicating the sound profit potential of the global oil industry.



Internal Risks

The Indian tyre industry is a reasonably profitable one, riding on the wave of the rising demand for automobiles of all sorts, including two-wheelers. Almost all major tyre manufacturers (MRF, Apollo, JK Tyres, Ceat, etc) in India performed rather satisfactorily in 2002. But, not all. Dunlop India Ltd was in ruins and faced liquidation. Why do firms within the same industry facing exactly the same external environment perform differently? Take any industry, say cement, textiles or banking—while some companies perform well, others perform satisfactorily, earning reasonable profits; there are others which struggle to exist and yet others incur losses.

Here lies the explanation why firms within the same industry facing exactly the same external environment perform differently: Decision-making skills, policies and competencies define certain crucial risks that can make or break a business enterprise. The strategies, methods, technologies, the motivation level, etc, are a few factors that are reflected in the performance and determine the survival of an enterprise. So, despite low operating risks emanating from external and industry factors, a badly run company implies high credit risk. Company analysis studies the third category among business risks—internal risks or company-/firm-level risks.

A company analysis addresses numerous questions such as: What are the company's main activities? What are its mission/goals? What are its strategies? How well did it do in the past? What are its major resources? How is the labour-management relationship? Relationship with suppliers and customers? How does it price its goods? How do they meet competition? Does it enjoy or has it built up certain advantages over competitors? How will the business environment changes impact its strategies and policies? Are the competitive advantages built up, flimsy (can be lost because of changes in environment)? Can they be copied by competitors?

Company analysis is a continuation of the two previous analyses—external environment and industry. (In this chapter, we will discuss the non-financial internal risks. Given the vastness and importance of financial risks, it will be treated in the next chapter.)

7.1 UNDERSTANDING THE BUSINESS ACTIVITY

Knowledge of the nature of business activity has a vital role in the study of internal risks. All major activities in the business should be clearly understood. Main products, installed capacity and its utilization, major customers, major market segments, raw materials, suppliers, technology and location are some of the prime areas to be covered. The study of these variables brings out the potential operating risks. Insights gathered from industry analysis and external analysis help to understand the suppliers and major customers of the company. For instance, if the suppliers' bargaining power is substantial, it will influence certain company policies. The credit executive should understand the strategies adopted to counter the bargaining power of suppliers and determine the suitability and success of these strategies so far. A thorough understanding of the company is essential to conduct SWOT analysis (discussed later), a powerful tool to unearth the operating risks involved.

Given the diverse nature of the businesses to be studied by credit executive, let us adopt a common framework applicable to all business organizations. We know all business firms acquire economic (physical and financial) resources from the environment and perform certain activities to enhance their value, resulting in another form of economic output (finished product/service). The following diagram shows a set of interrelated generic operating activities common to a wide range of firms.

Resources from environment > Process > Final output > Marketing & Distribution > After-sales operations

These activities are aimed at creating value that exceeds the cost of providing the final output (product/service). It will lead to a profit, which creates/adds value to the investors in the firm. **Resources acquired from environment** include all factors of production and related logistics such as procurement, warehousing, and inventory control, among others. Resources such as finance, legal, manpower are included herein. **Processes** involve value-adding activities that transform the inputs into the final

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product. They also encompass research and development, process automation, and other technology used in the processes. **Marketing and distribution** comprise activities required to get the finished product to the customer, including warehousing, order fulfilment, channel selection, advertising, pricing, delivery, etc. **After-sales operations** include warranties, gathering customer feedback, providing customer support and repair services, among others.

Understanding the nature of the activity itself highlights certain operating risks. For instance, the perishable nature of commodities is a risk for vegetables, fruits, dairy products and similar food businesses.

7.2 RISK CONTEXT AND MANAGEMENT

All business organizations take some kind of risks. The breadth, depth and pace of change faced by all companies pose many challenges and risks. Some of these risks are unexpected, but others—at least to some degree—are both foreseeable and manageable. Often a company's ability to manage its risks is evaluated on the basis of its management's track record, but previous experience alone is no guarantee that a company has sufficient risk management capability. To understand firm credit risk, the risk management capabilities of obligors/borrowers/debtors are important. The credit executive must understand various critical risks faced by the firm and determine whether the entity has proper risk management techniques. To understand the critical risks faced by a firm, the entity's goals and objectives and strategies are to be studied.

Goals and objectives: Successful organizations know what they want, and usually put this down in the form of performance targets, budgets or in any other measurable form, either in quantiative terms or qualitative terms or both. The primary task of the objective is to ensure the achievement of the mission and vision of the organization. Organizations with clear mission and vision are often more successful. While the mission and vision are long-term, the objectives and goals can change in near- to medium-term.

Strategies: Strategies are aimed at attaining objectives and goals. Stakeholders like investors and creditors should understand the major strategies of a business. For instance, while certain businesses follow a low price/high volume strategy, others might pursue high price/low volume approach to achieve their goals. Inadequate strategies pose a risk. Adequacy of strategies and the capability of the management to put those

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strategies into action to achieve goals are to be critically evaluated. Past performance is a good guide. Also, observations on how close the company came to achieving its goals and why it fell short of or exceeded them provide clarity on related risks and risk mitigants. Given the importance of strategy in the context of internal risks, the topic is covered in detail later.

7.3 RISK IDENTIFICATION STEPS

The number of risks impacting an entity is enormous. It is not practical to identify all such risks. A proper risk identification procedure should be developed by the CRA, to unearth significant ones. Generally risk identification is done through (a) Interviews and questioning (b) Market developments/Peer comparison along with internal benchmarking.

Interviews and Questioning

Meetings with the senior corporate management and discussions are the most commonly applied method of risk identification. While such initial meetings typically take two to four hours, more complicated cases may require one or more days of meetings. It includes factory visits, site and stock inspection, among other things. The meetings and visits will provide information on the company's operating/financial/marketing plans, its assessment of the competition, management policies and other risk factors. Creditors need to understand their customers' businesses, a necessity best met by open and good faith explanations by the business executives concerned.

The meetings are also important for the entity. They provide corporate executives and their advisors an opportunity to provide details regarding their plans as well as the company's prospects. The analyst should give the company adequate time to prepare a thorough presentation and guide the meeting with intelligent questioning to gather information. The analyst may call for background material before hand, including:

- a. Audited annual financial statements for five years
- b. Latest management accounts/interim financial statements subsequent to the previous audited ones
- c. Memorandum/articles of association/partnership deed/other legal or governmentrelated documents
- d. Product brochures and other descriptive materials on the operations and products/services

- e. Industry background
- f. Industry competitive factors
- g. Competitive advantages.

It is ofcourse, understood that the information provided should be kept in strictest confidence by the analyst.

Normal topics during a meeting are:

- Overview of major business segments
- Comparisons with competitors and industry norms, industry prospects
- Financial polices and financial performance goals and non-financial operating statistics
- Management's forecasts/projections/budgets
- Income statement, cash flow statement, balance sheet, accounting practices
- Operating assumptions
- Anticipated reliance on internal cash generation/external funds
- Capital expenditure(CAPEX) plans, financing alternatives and contingency plans
- Type of credit needed by the obligor with related terms and conditions.

Analysts should not base their conclusions on the company's assumptions and methodology, but these form the starting point of analysis aimed at understanding the real credit risk involved. In large banks and financial institutions, expert industry analysts specializing in certain sectors/industries are common. Opinion from such experts may also be sought during the assessment process.

Market Developments and Peer Comparison

The analyst should be a voracious reader and thirsty for information. Reading of business dailies and publications, attending useful seminars, discussions with peers and others with relevant experience and knowledge should be made a habit. Information on all factors mentioned in the previous two chapters should be at hand. Intelligence gathered from formal and informal sources and other secondary sources should be verified for reliability, accuracy and relevance. The company-given details should be verified against the realities, and discrepancies/differences if any, should be clarified/reconciled.

Peer analysis is yet another powerful tool to identify risks as well as relative strengths and weakness of the obligor. Products and processes used by others, technologies and aggressive/defensive policies pursued by them show the position occupied by the entity under analysis, in the overall context. Output from competitor analysis, mentioned in the previous chapter, is useful in assessing the competitors' strategies, current status, and future directions, among other things.

Major tools used to understand internal risks are given below.

7.4 SWOT ANALYSIS

Now it is time to conduct a SWOT analysis of the company. SWOT, often touted as a management tool for overview of the current situation, is also useful for reflection and appraising risks.

Strengths and weaknesses (SW) are internal factors over which the entity has a direct control or influence. Strengths are things the entity is good at, including its resources and capabilities that can be used as a basis for developing a competitive advantage. Examples of such strengths include: Core-competencies in key areas, financial power, patents, strong brand names, economies of scale, good reputation among customers, cost advantages from proprietary know-how, exclusive access to high grade natural resources, favourable access to distribution networks, innovation skills, superior technology, favourable experience curve, among others. Weaknesses refer to things it would like to improve. Poor R&D, weak marketing, obsolete technology/facilities, high cost structure and all factors opposite to those mentioned under strengths are examples of weaknesses.

Opportunities and threats (OT) are external factors. As they are exogenous, an organization lacks control over them, but is in a position to respond as they appear as chances and dangers, from the world outside. Some examples of opportunities that could open the doors for growth and profits are: Unfulfilled demand, arrival of new technologies, loosening of regulations and removal of international trade barriers. Opportunities can be taken advantage of if the firm takes necessary actions. A threat is something that may cause problems if the entity doesn't act to prevent it or limit its impact. Some examples of threats include: Consumers moving away from the firm's products, emergence of substitute products, new adverse regulations and increased trade barriers.

Operating risks lie buried mainly in weaknesses and threats, while occassionally, the strengths/opportunites may also translate into risks. For instance, suppose the strength

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of a company is its ability to churn out consecutive and simultaneous expansion and diversification projects, this ironically can carry the risk of project delays/cost overruns/misfired expansions. Similarly, opportunities will not automatically result in any benefit to the entity, if it chooses inaction, which itself is a risk.

The information output from a SWOT analysis is helpful in matching the firm's resources and capabilities to the competitive environment in which it operates, based on which broad strategies can also be determined:

Particulars	Strengths	Weaknesses
Opportunities	S-O strategies	W-O strategies
Threats	S-T strategies	W-T strategies

Fig. 7.1 SWOT-based broad strategies.

S-O strategies fit the strengths to the opportunities. Generally aggressive in nature, S-O strategies usher in more growth, increase in asset base and more profitability. The rapid growth of many software companies in India into global players can be traced to this strategy.

W-O strategies are aimed at overcoming weaknesses through the pursuit of opportunities. When Kinetic initially introduced auto-geared scooters, the weak image was overcome by showing its capability to travel long distances even in the extreme conditions of the Himalayas. Similarly, during the 1970s, one of the weaknesses of Japanese cars compared to their US counterparts was their smaller size. But with the oil crisis in the mid-70s, demand for fuel-efficient small cars soared, providing an opportunity for Japanese cars.

S-T strategies use strengths to counter vulnerability to external threats.

W-T strategies are defensive in nature. They prevent external threats from attacking a company's weak points. Exit strategy from a loss-making foreign market (weakness) in view of the emergence of a strong domestic competitor (threat) is an example of W-T strategy.

Having understood the broad strategies, let us dig deep to identify the risks associated with them.

7.5 STRATEGY ANALYSIS

Strategies are the cornerstones that determine the success or failure of a business enterprise. Financial stabilility, profitability, satisfied customers and sustainable competitive advantages are the consequence of effective strategies followed by firms. For instance, in recent times mega mergers are one of the key strategies followed by several multinationals. Exxon-Mobil, Daimler-Chrysler, Chevron Texaco and Pfizer-Prudential are some examples. Business strategies are among the hot topics taught in business schools. Business managers spend a lot of resources to find a winning strategy, while consultants earn a living prescribing appropriate strategies for different situations to solve diverse issues or attain goals.

Let us discuss the 12 main strategies followed by business world.

1. Cost Leadership

In this strategy, a firm competes on cost basis by becoming a low-cost producer in an industry for a given level of quality. Often, a cost leader can be considered the king in the industry. In the event of a price war, it can maintain profitability while the not-so-cost-efficient competitors suffer losses. Or, the firm can start a price war to keep new entrants away or teach some of the errant competitors a lesson. Similarly, as the industry matures and prices decline, the cost leaders can remain profitable for a longer period of time. The cost leadership strategy usually targets a broad market, resulting in large volume, makes efficient scale plant, incurs little product design/R&D costs and after-sales service. The firm sells its products either at average industry prices to earn a profit higher than that of rivals, or below the average industry prices to gain **market share**. Three of the ways in which firms acquire cost advantages are given below:

Economies of scale: A firm can bring down cost of production per unit by resorting to huge capacities. Bajaj Scooters is a low-cost producer primarily because of its huge capacity, which is also applicable to other market leaders such as Maruti. But economies of scale can also be built up in other key success factor areas as well. For instance, it is the economies of scale in technology that provides technology companies the edge. Microsoft, with its 2,000-plus highly qualified and experienced software professionals has been able to release successive new versions of Windows almost every alternate year since 1993. In companies such as pharmaceuticals, it is the economies of scale in R&D that matters.

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Production advantage: Cost leadership can be gained by having proximity to key inputs, simple design, expert engineering, favourable experience/learning curve.

Low input costs: Low labour cost (eg. China), low raw material cost (petrochemicals in the Middle-East) and similar availability of cheap key inputs enables companies to follow cost leadership strategy.

Every strategy has its risks, including the low-cost strategy. For example, other firms may be able to lower their costs as well. As technology improves, the competition may be able to leapfrog the production capabilities, thus eliminating the competitive advantage.

2. Differentiation

Developing products/services with unique attributes that are valued by customers, who are willing to pay more for such special attributes, guides differentiation strategy. The firm should be in a position to charge higher price that exceeds the extra costs incurred in offering the unique product. Most of the consumer products attempt to differentiate one way or another. Three of the common differentiation techniques are to:

Differentiate the product: Variations in the shape and design so that the products look different not only from those of competitors but from the various products of the same manufacturer itself. All manufacturers of consumer products (e.g. cars, TVs, computers, soaps, shampoos, etc) around the world follow this strategy religiously. Having different variety/appearance/quality are other techniques falling under this category.

Differentiate the price: Differing prices for different market segments is another common strategy. Cinema theatres, to hotels and airlines follow this strategy. Certain car manufacturers such as BMW/Lexus use this differentiation strategy to serve only the up-market clientele. While normal models of Toyota are marketed under Toyota brands (Corolla, Camry, etc) the Lexus models are marketed without highlighting the Toyota name. High price attracts a certain market segment. On most occasions, the price differentiation strategy goes hand in hand with product/market differentiation strategy of the same vein is the quantity discounts offered to large buyers. Here, more quantity means lower pricing.

Differentiate the promotion: Effective sales promotion techniques are powerful tools to build perceived differentiation in the minds of consumers. Spending sizable amounts on brand building is not uncommon in consumer products. Advertising agencies that

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offer better promotion techniques are always sought after by manufacturers. Superior signals of value and after-sales service can also act as powerful differentiation from identical product manufacturers.

3. Contraction

This strategy is used when the company wants to quit certain markets or reduce the number of products it has. For instance, soon after 9/11 Gateway declared closure of its manufacturing units in Asia. Similarly, in 2002, Volkswagen decided to stop production of its famous Beetle car. This strategy need not be perceived negatively, because contraction in certain sectors will free the company to deploy resources in areas where the potential is greater. Besides, continuation in wrong areas will be a drag on the operations, which may eventually lead to issues such as losses, liquidity crisis, low productivity, underutilization of capacity, etc.

4. Market Penetration

This strategy focuses more of the same product in the same market. One of the key strategies deployed by growth firms, market penetration is successful if following factors are present: (a) Market should be growing or should have growth potential. Otherwise, existing players will retaliate with price-war or trigger non-price wars such as promotion campaigns, hurting profitability eventually. (b) In a rather mature market, penetration is possible if one of the players leaves/shuts down operations. (c) In case the entity has a certain distinct advantage such as quality, brand power, it can attract more demand through this strategy.

5. New Markets

This strategy largely aims at branching out of the existing markets by pursuing additional market segments or geographical regions. This strategy works well if the firm's *core competencies* are product-related, which enable it to launch successfully in the new market. MRF's entry into certain export markets in Latin American countries, where cross ply tyres are still popular is an example.

6. New Products/Product Synergy Diversification

Product development or new models are one of the core strategies of many businesses, especially producers of consumer durables. TV technology has now changed from digital

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to LCDs and several other new technologies. Digital cameras are the latest products in photography equipment while VCP/VCRs are giving way to VCDs and DVDs. Developing several value-added derivative products, based on a core product is the best example of product synergy diversification. Existing product synergies are effectively used in the new product as well. All new products carry the risk of becoming a flop in the market, which can be mitigated to an extent by market studies.

7. Product/Market Diversification

While attempting entry into new markets with new products is generally viewed as a riskier strategy, it can be successful if the firm has both product and market competencies. A heavy vehicle manufacturer may enter the car market as was done by the Tatas in the late 1990s. Another area where this strategy can be successfully utilized is where the entity can bring its reputation in one area to another. A scooter manufacturer may enter the bike segment as was done by Bajaj in the 1990s and by LML in 2002.

Related vs unrelated diversification strategies are adopted in a variety of circumstances. As discussed earlier, related diversification strategies are attempted through product or market. Unrelated diversification means the firms launching into businesses, radically different from the ones followed hitherto. The entry of Bennett & Coleman into banking a few years back with Times Bank is an instance of unrelated diversification. Naturally, this is one of the riskiest strategies, although the proponents point out the benefit of unrelated diversification—such as a cyclical company acquiring a non-cyclical business.

8. Consolidation

This strategy is followed when the firm wants to preserve its market or any of its segments or product acceptability. Various techniques are used, such as branding of different products together, franchisees and licensing. Gujarat Ambuja's acquisition of small cement manufacturing companies (both sick and viable) and acquisition of sizable equity stake in ACC during the late 1990s/early2000s is an example of attempting to consolidate its position in the market. Now Gujarat Ambuja is supposed to be one of the top two cement producers in India. However, it is a risky strategy as has been proven by India Cements' acquisition of Raasi Cements and Shri Vishnu Cements, which created a dent in its profitability. Another example is HSBC which now wants to use the logo HSBC throughout the world, instead of different logos, used by its subsidiaries/associates till now. As part of this strategy, the HSBC brand name

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consolidation is actively promoted, with BBME (British Bank of Middle East, now known as HSBC Middle East) and others are now using HSBC logo.

9. Merger/Takeover

Mergers are now-a-days a frequently used strategy by both big and small businesses. The guiding philosophy of most of the mergers is to attempt combining of the strengths of merging firms to face external challenges better. For instance, the merger of Exxon and Mobil is stated to bring together the strong skills in oil technology of Exxon with the salesmanship of Mobil. Merging two corporate cultures is not an easy task. Takeover and acquisition are also like mergers with a difference. In merger, both entities are considered equal, while in other two the acquired ceases to exist.

10. Expansion

This is a common strategy whereby, as the manufacturer finds that it is possible to produce and market more, sometimes even doubling or trebling of current capacities is undertaken. Expansion brings in economies of scale and enables to increase the size of the firm to look beyond the traditional markets. However, sometimes firms prefer to stay small for ease in managing or to enjoy the protection attached to small business, among other things.

11. Cost Control

This is yet another commonly adopted strategy to rein in costs by finding alternative cheaper suppliers or raw materials, reducing staff strength, eliminating non-essential tasks, among others. Cost-cutting takes several forms, even that of selective buying. *Business Week* (9 April, 2001) reported that Nissan by dropping inefficient parts suppliers and consolidating orders with the most efficient ones, saved at least USD 2.25 billion.

12. Focus

The focus strategy concentrates on a narrow segment and within that segment attempts to achieve either a cost advantage or differentiation. The premise is that the needs of the group

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can be better serviced by focusing entirely on it. A firm using a focus strategy often enjoys a high degree of customer loyalty, and this entrenched loyalty discourages other firms from competing directly. Because of their narrow market focus, firms pursuing a focus strategy may have lower volumes and therefore less bargaining power. However, firms pursuing a differentiation-focused strategy may be able to pass higher costs on to customers since close substitute products do not exist. Firms that succeed in a focus strategy are able to tailor a broad range of product development strengths to a relatively narrow market segment that they know very well. Some risks of focus strategies include imitation and changes in the target segments. Furthermore, it may be fairly easy for a broad-market cost leader to adapt its product in order to compete directly in the focused segment. Finally, other focusers may be able to carve out sub-segments that they can serve even better.

The above mentioned strategies and their risks are just for guidance. The business world follows numerous strategies, to capture market share, drive out competitors, limit the bargaining power of suppliers/customers, develop core competencies, increase productivity, automate/computerize, and so on. Some of the other famous strategies employed by companies are 'Kaizen' and 'Kanban' (Toyota), just-in-time manufacturing/stock control, lean production, product innovation, activity-based costing, total quality management and balanced scorecards, among others. New strategies are evolving from various academics and business practioners along with the change in goals and objectives of the firms and the environment in which businesses operate.

The analyst/credit executives should identify the strategies followed by the firm and verify its chances of succeeding, given the core competencies, strengths, weaknesses and opportunities and threats emerging from external and industry environment. Any risk factor in the strategy is to be discussed with the company officials. It is better that the credit executives are not involved with fixing strategy for customers. One should be aware that there is a risk of the customer claiming damages for misguiding! It is essential that the strategies followed by the obligors are reviewed periodically by the credit executives—annually or semiannually or even on shorter durations, if needed—to ensure that they are working and still the best or desired approach for the company.

7.6 PITFALLS IN STRATEGY

Let us examine three of the risks in the strategies discussed above:

i. **Stuck in the middle**: Whenever a firm attempts multiple strategies to attain different goals, care should be taken to ensure that such strategies are compatible with one another.

If a firm attempts to achieve an advantage on differentiation and cost leadership strategies, it may fail in the following scenario: When a firm differentiates itself by supplying very high quality products, it risks undermining that quality in case it seeks to become a cost leader. Even if the quality does not suffer, the firm would risk projecting a confusing image. For this reason, it is argued that to be successful over the long-term, a firm must select only a few compatible strategies, rather than pursuing all possible strategies. Otherwise, conflicting strategies will cause the firm to get "stuck in the middle" and it will not achieve any competitive advantage.

Firms that are able to succeed at multiple strategies often do so by creating separate business units for each strategy. By separating the strategies into different units having different policies and even different cultures, a corporation is less likely to become "stuck in the middle". There exists a viewpoint that a single generic strategy is not always best because within the same product range customers often seek multi-dimensional satisfactions such as a combination of quality, style, convenience and price. There have been cases in which high quality producers faithfully followed a single strategy and then suffered greatly when another firm entered the market with a lower-quality product that better met the overall needs of customers.

ii. Misdirected strategy: This covers many areas, but prime examples include (a) concentration on tax avoidance (b) focus on increasing sale, ignoring profits (c) looking for prestigious rather than profitable projects (d) short-term fire-fighting rather than long-term strategy. (e) complicating the group structure (f) window dressing, etc.

iii. Ethics & morals: The above mentioned are some the legal or ethical strategies followed by companies. In real life many other strategies are followed which borders on civil and criminal liability. The Monopolies & Restrictive Trade Practice Act puts restrictions on certain strategies. Industrial episonage and arson of competitors' business premises are pursued by unscrupulous businessmen.

7.7 MANAGEMENT ANALYSIS

Bad management is one of the biggest risks at the entity level, which can cause a good business to fail, despite all favourable factors. Management risk refers to the defects, inadequacies and lack of skill and experience in the people in key positions. The degree of incompetence and unsatisfactory track record of the management team provides the magnitude of this risk. Following are 14 common scenarios, which may be an operating risk related to the management:

1. One-man Rule

A beaver-like entrepreneur full of energy can build up a successful business in no time, as has been proven in several cases. For instance, Walt Disney proved everyone wrong by bringing out a successful media and entertainment company almost single-handed. Similar is the case with Dhirubhai Ambani, who was the driving force behind Reliance, the largest private sector company in India. Once the business grew larger, their business acumen resulted in bringing in professional management to run the show. But at least some entrepreneurs do not do so. The legendary founder of Ford Motors attempted to enforce one-man rule, which almost led the company into bankruptcy in the late 1930s. The problem with one-man rule is that all decisions are imposed regardless of opposition, allowing for no discussion and heeding no advice. The strong conviction of personal invincibility, created by previous success directs them. Sooner or later they encounter a series of events, which initially will be covered up but finally blows up, resulting in failure, collapse and even suicide, as happened in the case of Robert Maxwell, the British media tycoon.

One-man rule exists in small, medium and large organizations. In small businesses, the owner is inevitably the ruler as he cannot take in experienced and highly qualified managers, given the lack of resources and size. Hence this risk looms large in all small business. But, has been highlighted in the cases of Ford Motors and the British Media group, the one-man rule exists in large corporations as well.

2. Joint Chairman/CEO/MGD Position

At the time of the collapse of Enron, both positions—Chairman and CEO—were handled by the same individual. In a normal organizational structure, while the CEO reports to the Board, a dotted line make him answerable to the Chairman, who also heads the Board. This puts checks on the unbridled powers enjoyed by the top-most executive authority in a business firm. Once both positions are combined, the balance is lost, leading to indulgent decisions. This is very potent operating risk and the CRA should investigate deep into the causes and reasons for having a combined position, if such instances are encountered.

3. Imbalance in Top Management Team

One of the main rules of corporate governance under the Indian Companies Act is the need to have a balanced management team with an independent audit committee. Qualifications, breadth of experience, talent and skills should be mixed in appropriate quantities in the top management. Lack of proper balancing at the top is a significant operating risk, that may cause wrong proposals to be approved while good ones are rejected. One of the reasons for the collapse of Barings Bank is attributable to this factor. While Nick Leeson entered into complicated derivative deals, the approving management team comprising mostly merchant bankers, missed certain finer points, which should have raised their eyebrows early enough.

4. Weak Finance Function

Lack of financial monitors such as budgeting, accounting controls, timely financial information in sufficient detail (territory-wise, product-wise, period-wise, etc) hints at a weak finance function, which can create havoc. Given the importance of financial expertise, most boards include experienced financial experts. Most of the term credit institutions usually insert a covenant imposing recruitment of a capable finance manager as one of the approval terms.

5. Lack of Skilled Managers

While the junior managers are just fresh from the colleges or may have around five years of experience, the middle management may be lacking depth in experience to handle complex tasks. Imagine what would happen if the freshers lack skills, middle management is inept and senior management lacks depth and qualifications. Such problems in Senior Management is a significant operating risk. The inability to attract skilled managers to key positions is a serious risk. Some deficiencies in middle and junior levels, although an operating risk, are not a major concern, provided senior management consists of capable hands. It should be ensured that all major functions are in capable and well qualified hands.

6. Disharmony in Management

Office politics and some rivalry in the management of companies, although an accepted fact, sometimes develops into a serious risk, impacting the operations. Usually in case of

a power-struggle, decisions by one are thwarted by another, causing a stalemate or ineffectiveness in day-to-day operations. CRA should be concerned if such situations are prolonged.

7. Change in Ownership

This is yet another risk, because the future directions under the new management need not be the same as those of the previous one. Many well-run companies have suffered after change in ownership. This is an operating risk in certain occasions, as has been the case with the take-over of Dunlop India (by Mr. Chabria), after which the company's fortunes declined.

8. Cultural Rigidity

If the business enterprise is operating in a highly competitive and creative field like fashion, or experiences frequent model changes, rigid and bureaucratic style is an operating risk. Many organizations which lagged behind in growth and were overtaken by their competitors, often identified the problem as being too bureaucratic. Shedding of layers in management to speed up decisions is among the common solutions. A flatter organization with new innovative products usually results in picking up of growth momentum.

9. Lack of Internal Controls

Proper internal controls go a long way in safeguarding assets and ensuring appropriate risk-taking complying with the procedures laid down. Non-compliance with or laxity in internal controls is a threat, which can cause the demise of the organization itself. CRA can often derive comfort, if the audit report is unqualified, because auditors do conduct a thorough examination of the internal controls and its implementation and ought to report if serious inconsistencies exist.

10. Low Staff Morale

Employees are the dynamic resource of any organization. If almost all employees display low morale, it signals some serious problem with the management capability. All successful organizations usually have a satisfied workforce and are concerned about

their morale, which is often taken into consideration through employee surveys and other means of feedback.

11. Fraudlent Management

Unscrupulous individuals in the top management deliberately mismanage affairs so as to milk the organization for personal benefits to the point of bankruptcies and demises. For CRA, this can be considered as the ultimate management risk and if it is proven to exist, it is better not to extend credit to such an organisation at all.

12. Myopic Vision

Sometimes public held companies, especially those listed in the stock exchange, are in the media glare. Often, top managers of such entities focus on short-term profitability, to the detriment of long-term interests. Myopic vision can happen in non-listed business entities as well, for a variety of reasons—management incapability, lack of talent/experience, etc. Disregarding long-term interests will lead to forgone opportunities such as loss of market share to competitor who had decided to expand, resulting in economies of scale, and is now threatening with cost competition.

13. Big Projects

CRA should be wary of big projects, which, if they fail, could place the health of the company in jeopardy. Sometimes aggressive entrepreneurs get carried away by the rosy side of the new project, ignoring the risks, which include collapse of current healthy business as well. Creditors should worry if the success of the project is key to the survival of the firm. As a guideline, banks should finance a new project only if the cash flows from the existing businesses are adequate to cover the repayments. All creditors who support a business that ventures into a big project are indirectly taking the equity risk that the new business will succeed.

14. Inadequate Response to Change

Ideally, a good management will anticipate the adverse changes in the economy and industry and draw up suitable strategies to take preventive measures. Lack of response to the changes in the economy, environment or other external factors of on the business is a key risk.

7.8 OTHER INTERNAL RISKS

1. **Financial risks**: Several forms of financial risks exist in a company. We will discuss them in detail in the next chapter.

2. **Production risks**: Any event that can cause cessation of production activity or loss of production, falls into this category. Breakdown of key machinery, shortage of main inputs and natural calamities (fire, earthquake, flood, etc) are some of these risks.

3. **Corporate risks**: Risks that affect the entire company and its future directions fall under this category. Huge losses in a subsidiary may carry the risk of cash downstreaming, while a hostile takeover threat may cause the top management to divert attention from normal operating activities.

4. **Human Resource risks**: Strikes and militant unionism are among the risks in this cateogory. Other risks include very high staff turnover, poor motivation levels, which will lead to poor productivity levels.

5. Product risks: Products with chemical and similar ingredients can sometimes be harmful, causing injuries to the user or environment, resulting in penalties. It can sometimes lead to the bankruptcies and collapse of companies. An example is the bankruptcies due to asbestos litigation. Even now multinationals such as ABB and Halliburton are struggling because of asbestos litigation. Sometimes, use of certain methods or products result in patent violations, inviting penalties.

6. **Customer risks**: Reliance on a few buyers who can easily switch to a competitor is a significant operating risk (concentration risk). A strong relationship with customers and a time-tested track record can be considered as mitigants.

7. Limited geographic area: Most of the small and medium businesses operate within a specified area. They lack resources to identify and exploit opportunities available in far markets.

8. **Key man risk**: Companies that cannot function effectively without the relationships or expertise of certain executives are vulnerable if such executives leave abruptly. In the

case of family businesses, if such executive is older with no clear sibling being groomed to take over, or if the siblings lack skills, this risk is evident.

9. **Legal risks**: Sometimes certain actions or policies or even strategies may result in infringement and may result in penalties, monetary or otherwise.

10. Siblings rivalry: A visionary entrepreneur may create a formidable business entity/group, which sometimes falls into the hands of feuding siblings/successors. CRA should clearly understand the succession plans, which, if absent, can be considered a serious risk, especially if the CEO/entrepreneur is on the verge of retirement.

11. Image risks: Instances and events that lead to the loss of consumer confidence in the products of the company, can lead to revenue loss and drop in profitability.

The above mentioned risks are just for guidance, because the real business world can throw up several types of risks. CRA should have a discerning eye to identify them. Some of the other risks can be (a) Adverse information in media, (b) Litigation involving top management personnel (c) Poor maintenance of factory/offices (d) Under-utilization of capacity (e) Obsolete stock (f) Extravagant spending (g) Frequent change in auditors (h) Auditors having other assignments in the company, etc.

Exercise: Read biography of Lee Iaacocca, who in the early 1980s, rescued Chrysler Corporation—then the third largest automobile manufacturer in the world—from the brink of bankruptcy and turned it into a profitable institution and identify (a) Strategies (b) Key management changes (c) SWOT of Chrysler at that time (d) Impact of external risks, especially the higher oil prices (e) Govt. support and guarantees. Examine how the various internal risks were effectively managed to ensure the turnaround. (Or, read any other business biographies such as those of Sam Walton, founder of Wal-Mart.)


Financial Risks

Many businesses fail not because of lack of business opportunities, but due to poor or improper management of financial affairs. Financial risk refers to the chances of collapse of a business due to wrong financing polices/decisions/strategies such as lopsided capital structure and asset-liability mismatch. Financial risks can plunge a successful business to the brink of bankruptcy, if not into it. Hence, it is very vital for a credit decision to have an in-depth financial analysis of the customer. Financial analysis serves three main purposes: (a) It digs deep and brings out financial risks (b) It triggers questions that would lead to a meaningful operating/business analysis. This explains why financial details get prominence among the information called for by credit providers. (c) Thirdly, especially for financial intermediaries such as banks, it is also useful to determine the extent of financial support needed by the prospective borrower.

8.1 IMPORTANCE OF FINANCIAL STATEMENTS

Financial statements, the end product of accounting, are viewed as proxies of economic activities and business performance. Analysis of financial statements enjoys a prominent place in the assessment of the study of credit risks, lending decisions and ongoing monitoring of the lending portfolio. Financial statements, preferably audited, are the major source of information to conduct financial analysis because they contain data related to land, building, machinery, vehicles, stock, receivables, cash, bank deposits and borrowings, capital, external creditors, tax liabilities, sales, cost of sales, selling expenses, other overheads, interest costs and cash flows/funds flows, among others. It summarizes the economic impact of the various operational and strategic decisions taken by the management.

Unambiguous understanding of inexplicable transactions or deviations in accounting policies to boost profit or reduce losses or to show better financial position should be the focus of the financial analysis. Imagine a large business corporation like Reliance Co. or Halliburton Co. stating its business performance without financial figures. Without them, it is impossible to understand the impact of what a business is doing and communicate with anyone who would interact with the company as investor, creditors, etc. That is why the accounting is aptly known as the 'language of business'. Fig. 8.1 explains how financial statements summarize the performance of a business entity.

The diagram is a general description of how financial statements evolve and capture the entire gamut of all events, business decisions and actions, expressed in monetary terms. For our analytical discussion purposes, we take financial statements to mean the set of information including balance sheet, profit & loss, cash flow statement (or funds flow statement, if CFS is not available), notes to accounts and other supplementary data provided to the reader, by statutory requirement or otherwise.



Fig. 8.1 Financial statements summarize the performance of a business entity

8.2 QUANTITY OF FINANCIAL STATEMENTS

How many years' financial statements have to be analyzed in order to study the financial risks involved? Answers will vary depending upon the nature of business credit extended. Ideally speaking, a ten-year analysis is better because: (a) It captures the business performance through the different economic cycles. (Generally, there is a business cycle in most of the economies, every 5-10 years) and (b) It provides more insight into the management policies and the impact in the past: Did the firm perform in accordance with management strategies? How was the growth financed? Why was the firm stagnant despite spectacular industry growth? Check the two/three most important decisions made by the top management of the company and study their impact about the financials over the period. This can tell something on the quality of the management. While studying ten years financials is ideal, at least five years' financial data is needed for a new credit prospect, unless the firm's age is lesser.

8.3 FINANCIAL ANALYSIS

Financial analysis should strive to recognize and identify early warning signs and other financial risks and suggest suitable defensive strategies and practical solutions to mitigate risks and protect the credit asset from potential problems and credit losses. To put it briefly, CRA undertakes financial analysis, primarily for ensuring the creditworthiness of customers. What is 'creditworthiness'? It denotes checking whether the prospective borrower is worthy to receive credit. It is similar to the term of 'seaworthiness' of a ship, which is a normal clause in marine insurance policies. Just as a ship lacking 'seaworthiness' carries significant risk of sinking in the sea, an entity which is not 'creditworthy' has a high propensity to default on credit.

Each component of the financial statement contains numbers, pregnant with information. It is both an art and science to read and analyze financial statements and bring out the wealth of information behind the numbers. Over the years, several techniques have been evolved and are still evolving, aimed at decoding the information content in financial statements. An analyst should use the 'why' and 'why not' style as he examines the items presented in financial statements. Let us examine each component, beginning with the Balance Sheet.

Balance Sheet

The balance sheet (B/S) shows the financial position of a business as on a particular date, at the end of a period—say a year, a quarter, a month, etc. The balance sheet is a critical tool for an effective credit evaluation. It answers a lot of questions an analyst has while ascertaining creditworthiness, such as:

- 1. What is the capital structure of the business? Is it appropriate? Have the owners of business put sufficient capital into the business?
- 2. What are the short-term and long-term liabilities of the business? Are they properly structured? Is it possible to relate each source of finance to a particular asset item?
- 3. How is credit provided by trade suppliers? Did the suppliers alter trade terms?
- 4. What are the taxation and other statutory liabilities outstanding?
- 6. What is the quantum of fixed assets and are they put to optimum use?
- 7. What are the level of stocking required and stock management policies in broader terms?

Sometimes the credit executive will have to make certain adjustments to the balance sheet variables as presented to him. This is because of the fact that the auditors prepare the audited financial statements generally for the shareholders and many items are classified accordingly. However, credit executive is looking at things from an entirely different angle, which calls for certain adjustments to balance sheet items. Following are certain instances where the analyst would have to recast the B/S, sometimes through profit and loss (P&L) account.

1. Intangibles: The analyst should deduct this from the net worth to arrive at tangible net worth.

2. Unsubordinated shareholders' loan: If included as part of the equity or shareholders' funds this item should be excluded, especially in the case of limited liability companies. The logic is that legally, such loans rank in most cases *pari-passu* with external creditors.

3. Dues from related parties: Although this item normally appears as current asset item, the analyst may treat it as non-current, given the control the firm may be having on this item. However, the dues to related parties, current in nature, should be treated as such, conservatively.

4. Dividends payable: In certain cases the dividends payable may appear as part of the equity/shareholders' funds. These should be separated and treated as current liability.

5. Reassessing the values of balance sheet variables: If the analyst views that certain assets require more provisioning (eg. 10% provisioning of debtors instead of 3% in the books) given the latest developments or otherwise, then the B/S should be adjusted to reflect the impact.

6. Converting off-balance sheet items into on-sheet items: Conversion of off-B/S items, into on-B/S items is yet another necessary step. Accordingly, the B/S should be recast for analytical purposes by capturing the impact of off-B/S leases, hedges, etc.

7. Alternative accounting policy: Where the analyst suspects that the accounting policies used to account for certain critical items are not the best, alternative accounting policies may be applied to the extent possible.

Income Statement (or) Profit & Loss Account

The income statement shows the revenues from operations (sale of goods or services from continuing or regular operations) and costs and expenses incurred in connection with such revenues and the profit or loss resulting there-from. As in the case of B/S, the analyst may have to recast the P &L account to suit the purpose at hand. Some such situations that require such recasting are:

- 1. To give effect to the crystallization of a contingent liability. For example, suppose the product liability litigation, which was shown in the balance sheet as contingent liability is now adjudged against the company.
- 2. To reverse capitalization of certain expenditures. Interest capitalization during the pre-operating period is still disputed. As happened in the case of WorldCom, sometimes certain revenue expenses are capitalized. Analysts should undo such gimmicks wherever suspected.
- 3. To provide for certain omitted expenses or to make extra provisioning, writedown/write-up certain asset/liability values, disclosed in the B/S. It is to be noted that most of the recasting will impact both B/S and P&L.
- 4. To capture results of 'discontinued/extraordinary operations' or prior period items, if not properly classified in the P&L provided by the borrower/debtor. In certain cases, the firms spread over the effect of certain items (e.g. tax penalties) to the past periods, so that the current year profits need not take the full impact.
- 5. To assess the impact of alternative accounting policies.

Cash Flow Statement (CFS)

CFS is the result of the search of the financial community for a solution to overcome the drawbacks of B/S, P&L and funds flow. It waters down the inefficiencies, if any, which might have crept into the financial statements by deliberate accommodative accounting policy decisions taken by the management. It answers the questions, (which cannot be fully answered by B/S and P&L) such as: (a) Despite suffering from losses, how did the company manage to pay dividends? (b) How is the increase in bank borrowings utilized? (c) Despite higher net profit for the period, why did the firm default on the term-loan instalment?

CFS is important because the survival and success of any business is determined not by 'accounting profits' alone but by its ability to generate cash in excess of cash outflows. It helps the analyst to form an opinion about the strength, stability and sufficiency of the cash flows to meet various obligations including interest, dividends, tax liabilities and repayment of term commitments and loans. Occasions of recasting of cash flows are rare, but not improbable. There are situations where the analyst has to make certain cash flow adjustments. Some instances are:

- 1. To classify an item under proper head. Suppose a certain investing activity is shown under the operating activity, the analyst may wish to recast it.
- 2. To reflect the impact of certain recasting done in B/S or P&L. For instance, if capitalization of certain expenses is re-classified, then the cash flow headings will also shift—from 'net movement in fixed assets' to the 'net result for the year'.

8.4 ANALYTICAL TOOLS

Financial analysis can be done in many ways, of which four principal tools are described below:

- Accounting Analysis
- Common Sizing
- Indexed Trend Analysis
- Ratio Analysis

Accounting Analysis

Deliberate manipulation of accounting policies is not uncommon. This can critically impact the solvency of companies, as demonstrated by the recent collapse of companies like Enron and WorldCom. Hence, the study of accounting policies used while compiling financial statements is important. Following are the major steps of accounting analysis:

a. Understanding the critical activities: Every business has certain critical factors, upon which its survival hinges. For instance, for a trader dealing in fast-changing technology (mobile phones, PCs) items, stock management is critical. So, accounting policies used to record the stock, purchases and provisioning are decisive. Similarly, accounting policies related to the recognition of interest income on low-quality (substandard) credit assets and provisioning of credit losses, are important for a financial institution with large credit portfolio.

b. Accounting choices: Several accounting policies are available, which allow flexibility to account the same transactions in dissimilar ways. Hence the CRA should identify the best method to account the transactions, especially the critical factors, and confirm whether the accounting policy implemented complies with the substance rather than the form. Knowledge of accounting standards and accounting expertise is highly desired for the meaningful understanding of accounting of transactions. If necessary, the CRA should not hesitate to consult accounting experts—professional accountants.

c. Accounting estimates: Several estimates are done by the firm while compiling financial statements. Estimates of life of fixed assets, provisions on bad and doubtful debts, slow moving stock, termination/retirement benefits to staff, taxation liabilities, etc., are some of them. The analyst should ensure that the estimates have been reasonably arrived at.

d. Judgment and Evaluation: The analyst should evaluate the accounting policies and estimates followed by the entity. Consideration should also be given to the off-balance sheet items and contingent liabilities. If the analyst arrives at the opinion that the best accounting alternatives have not been followed or that accounting estimates are improper, then the recasting of the financial statements becomes necessary. For instance, if the life of a machinery item is assumed to be thirty years, evidently the analyst should investigate and find out the reliability of the estimate and recast it if necessary. Similarly, from the debtors aging, it can be understood whether appropriate provisioning has been done. If the analyst feels that long outstanding overdues are not properly provided for, then adjustments are called for.

An entity may attempt creative accounting/manipulate accounting estimates under certain circumstances, some of which are: (a) To hide business deterioration (b) To maintain the rating by external rating agencies such as MOODYS, CRISIL, etc., at acceptable levels (c) To ensure performance bonus (for top management), normally linked to the financial results (d) Compliance with financial covenants imposed by the lenders (e) Maintenance of share prices at higher levels. However, all accounting disparities need not be driven by ulterior motives. For instance, a drop in debtors'

provisioning may reflect the change in customer focus. The judgment and logical skills of the analyst should be carefully used while considering all possible explanations of accounting changes/disparities and the presence of suspicious circumstances. Whilst Merck's treatment of certain selling expenses as an addition to sales, which was later charged off as selling costs caught the headlines temporarily, it was the accounting treatment of certain revenue expenditure by WorldCom as capital expenditure that really created a storm along with Enron in 2001/2002.

Common Sizing Analysis (CSA)

CSA facilitates easier and productive comparisons and better understanding of financial statements. It is considered a powerful tool for 'year-on-year' analysis as it brings out the changes over the period in an easily comprehendible manner. It is arrived at by converting all items in the financial statements, as a percentage of the total. The usefulness of CSA is evident from Example 8.1:

Example 8.1: The balance	sheet & profit	and loss accounts	of ABCD	Ltd for	the
FYE 31.03.02 and 31.03.01 are	given below.				

A. BALANCE SHEET			B. INCOME STA	ATEMENT	(Rs. Millions)
SOURCES OF FUNDS	0203-(12)	0103-(12)	Particulars	0203-(12)	0103-(12)
Owner's Fund			Sales	421,219.40	254,293.40
Equity Share Capital	10,535.60	10,534.90	Mat. Consumed	-302,154.9	-178,380.40
Share Application Money	3,422.90	0	Mfg. Expenses	9,880.5	-11,734.50
Reserves & Surplus	237,409.10	109,411.00	Depreciation	-28,161.40	-15,651.10
Loan Funds			Personnel Exp.	5693.8	-4,410.70
Secured Loans	141,888.90	40,684.00	Conversion Costs	-43735.7	-31796.3
Unsecured Loans	47,395.90	60,673.90	COGS (sub-total)	-345890.6	210176.7
Total	440,652.40	221,303.80	Gross Profit	75328.8	44116.7
USES OF FUNDS			Selling Expenses	-13,210	-7,617.80
Fixed Assets			Admin. Expenses	-9584	-5,928.10
Gross Block	467,273.20	253,559.90	Operating Profit	52,534.80	30,570.80
Less: Revaluation Reserve	-27,385.00	-27,707.80	Investment Income	7,430.90	3,685.30
Less: Acc. Depreciation	-150,769.20	-118,415.30	Other Income	18.1	13
Net Block	289,119.00	107,436.80	PBIT	59,983.80	34,269.10
Capital Work-in-progress	15,333.10	5,123.80	Financial Expenses	-18,730.10	-12,472.50
Investments	38,501.60	67,261.10	PBT	41,253.70	21,796.60
Net Current Assets			Tax Charges	-11,920.00	-1,395.00
Cur. Assets, Loans & Adv.	196,795.40	91,225.10	PAT	29,333.70	20,401.60
Less: Curr. Liabilities	99,725.30	49,743.00			
Total Net Current Assets	97,070.10	41,482.10			
Miscellaneous exp. not w/of	f 628.6	0			
Total	440,652.40	221,303.80			

Establishing a link among various figures of two years for a meaningful comparison is a tricky exercise with the numbers shown above. However, CSA solves it as is evident from the following table:

COMMON-	SIZED BA	ALANCE SH	IEET & INCOME ST.	ATEMENT			
A. BALANCE SHEET			B. INCOME STAT	B. INCOME STATEMENT			
SOURCES OF FUNDS	0203-(12)	0103-(12)	Particulars	0203-(12)	0103-(12)		
Owner's Fund			Sales	100%	100%		
Equity Share Capital	2%	5%	Material Consumed	72%	70%		
Share Application Money	1%	0%	Mfg. Expenses	2%	5%		
Preference Share Capital	0%	0%	Depreciation	7%	6%		
Reserves & Surplus	54%	49%	Personnel Exp.	1%	2%		
Loan Funds			Total Conversion Exp.	10%	13%		
Secured Loans	32%	18%	COGS	82%	83%		
Unsecured Loans	11%	27%	Gross Profit	18%	17%		
Total	100%	100%	Selling Expenses	3%	3%		
USES OF FUNDS			Admin. Expenses	2%	2%		
Fixed Assets			Operating Profit	12%	12%		
Gross Block	106%	115%	Investment Income	2%	1%		
Less: Revaluation Reserve	-6%	-13%	Other Income	0%	0%		
Less: Acc. Depreciation	-34%	-54%	PBIT	14%	13%		
Net Block	66%	49%	Financial Expenses	4%	5%		
Capital Work-in-progress	3%	2%	PBT	10%	9%		
Investments	9%	30%	Tax Charges	3%	1%		
Net Current Assets			PAT	7%	8%		
Current Assets	45%	41%					
Less: Current Liabilities	23%	22%					
Total Net Current Assets	22%	19%					
Miscellaneous exp. not w/off.	0%	0%					
Total	100%	100%					

CSA saves time and provides an overall view of the situation and equips the analyst for intelligent investigation to conduct an in-depth analysis. Now the reader can establish connection among the items, within a matter of few minutes, while an experienced eye can do it in seconds. For instance, let us sum up the balance sheet changes based on common-sized balance sheets:

Assets (Use of funds): Investments, which accounted for 30% of the assets in the previous year dwindled to a minor asset and form just 9% of the total as of 31.03.02. The reason is traceable to the sharp increase in the fixed assets—increase in the net block to 66% from 49%, evidencing expansion. However, capital working in progress was just 2% in the previous year, which remained at an almost identical level at 31.03.02. Hence, a take-over/acquisition can also be a reason for the increase in the net block. The

increase in the current assets (to 45% from 41%) exceeded that of the increase in current liabilities (from 22% to 23%), suggesting relatively less reliance on current liabilities to fund the current assets. Although fixed assets are revalued, overall impact to the balance sheet is insignificant as the revaluation amounted to just 6% to the total.

Sources of funds: The reduction in paid-up capital to 2% of the total sources of funds shows that during FY2001-02, there was a significant shift in funding pattern. Reserves & surplus percentage jumped to 54% from 49%. In view of the presence of share application money, it is evident that one of the reasons for the increase in reserves & surplus ought to be the share premium. Proportion of unsecured loans reduced while that of secured loans increased, suggesting stricter credit terms by the bankers/lenders. Requirement of the new share issue and new loans are traceable to the sharp increase in the assets—increase in the net block—reflecting expansion. These insights ought to trigger some intelligent questioning by the analyst. (*Interpretation of common-sized P&L is left to the reader, given its straightforward nature.*)

Indexed Trend Analysis (ITA)

Historical financial performance can be effectively studied by ITA. It has several advantages as it shows: (a) How the businesses performed during the business cycles (b) Financial impact of the managerial decisions taken, such as expansion, acquisition or disposal of business segments (c) Whether the business is growing or declining. And of course, it provides a base for further intelligent questioning of the situation. Example 8.2 will clarify the advantages of the indexed trend analysis:

Example 8.2: The five-year balance sheets and profit and loss accounts of ABCD Ltd are given below.

A. BALANCE SHEET					(Rs. Million	s)
SOURCES OF FUNDS	0203-(12)	0103-(12)	0003-(12)	9903-(12)	9803-(12)	_
Owner's Fund	10 525 60	10 524 00	10 524 50	0 222 00	0.210.00	
Share Application Money	3,422.90	10,534.90	10,534.50	9,333.90 0	1,879.50	
Preference Share Capital	0.00	0	2,929.50	2,529.50	0	
Reserves & Surplus	237,409.10	109,411.00	98,652.90	84,119.40	80,916.90	
Loan Funds						
Secured Loans	141,888.90	40,684.00	59,881.10	54,776.40	27,367.80	
Unsecured Loans	47,395.90	60,673.90	55,321.30	52,076.50	55,105.50	
Total	440,652.40	221,303.80	227,319.30	202,835.70	174,588.70	

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USES OF FUNDS						
Fixed Assets						
Gross Block	467,273.20	253,559.90	243,309.50	186,503.30	178,483.30	
Less: Revaluation Reserve	27,385.00	27,707.80	27,710.60	27,710.60	27,710.60	
Less: Accu. Depreciation	150,769.20	118,415.30	92,140.60	66,919.30	49,444.70	
Net Block	289,119.00	107,436.80	123,458.30	91,873.40	101,328.00	
Capital Work-in-progress	15,333.10	5,123.80	3,314.20	34,378.30	20,694.30	
Investments	38,501.60	67,261.10	60,665.60	42,945.90	42,823.30	
Net Current Assets						
Current Assets,	196,795.40	91,225.10	78,539.50	84,651.80	51,323.10	
Loans & Advances						
Less: Curr. Liabilities	99,725.30	49,743.00	38,658.30	51,013.70	41,580.00	
& Provisions						
Total Net Current Assets	97,070.10	41,482.10	39,881.20	33,638.10	9,743.10	
Unamortized Misc. Exp.	628.60	0	0	0	0	
Total	440,652.40	221,303.80	227,319.30	202,835.70	174,588.70	
B. INCOME STATEME	ENT					
Dontioulons	0903 (19)	0102 (19)	0002 (19)	0002 (19)	0902 (19)	
Salas	491 910 40	254 203 40	178 408 60	126.238.00	115 100 00	
Material Consumed	309154.90	178 380 40	190,490.00	83 004 10	76 165 20	
Total Conversion Evp	42725 70	21706.20	220,203.30	16440.10	14550.80	
COCS	345890.60	910176 70	143703 60	00534.20	00795.00	
Cross Profit	75398.80	44116 70	34795.00	26703.80	94384.00	
Solling Exponsos	13910.00	7 617 80	3 763 60	20703.00	24304.30	
Adminstrative Expenses	9584.00	5 928 10	5,703.00	5,020,30	4, 100, 70	
Operating Profit	52 534 80	30 570 80	25 372 20	18 779 10	17 849 90	
Investment Income	7 430 90	3 685 30	6 281 00	5 994 40	3 954 90	
Other Income	18 10	13.00	38 70	115 30	1 393 70	
PRIT	59 983 80	34 269 10	31 692 80	24 888 80	29 490 10	
Financial Expenses	18 730 10	12 479 50	10 458 30	7 789 60	5 578 80	
PRT	41 953 70	21 796 60	91 934 50	17 099 20	16 841 30	
1 D 1	41,200.70	21,730.00	21,204.00	17,033.20	10,041.00	
Tax Charges	11 990 00	1 395 00	610.00	340.00	65500	
Tax Charges	11,920.00 29 333 70	1,395.00 20.401.60	610.00 20.624.50	340.00 16 759 9	655.00 16 186 30	
Tax Charges PAT	11,920.00 29,333.70	1,395.00 20,401.60	610.00 20,624.50	340.00 16,759.2	655.00 16,186.30	

While the array of numbers presented above contains significant information, it is difficult to understand how each balance sheet variable has changed over the years, from the absolute numbers. Converting the absolute numbers into an index with 1998 as base year facilitates better comparison and comprehension of the trend, as is evident from the following table:

Let us summarize the observations on ITA of B/S.

In relation to the total index, which increased from 100 to 252 during the five-year period, some items have grown more rapidly, while certain other items were either slow

A. INDEXED TREND A	NALYSIS O	F BALANCE	SHEET			
SOURCES OF FUNDS	0203-(12)	0103-(12)	0003-(12)	9903-(12)	9803-(12)	
Owner's Funds						
Equity Share Capital	113	113	113	100	100	
Share Application Money	182	0	0	0	100	
Preference Share Capital	0	0	100	100	NA	
Reserves & Surplus	293	135	122	104	100	
Loan Funds						
Secured Loans	518	149	219	200	100	
Unsecured Loans	86	110	100	95	100	
Total	252	127	130	116	100	
USES OF FUNDS						
Fixed Assets						
Gross Block	262	142	136	104	100	
Less: Revaluation Reserve	99	100	100	100	100	
Less: Accu. Depreciation	305	239	186	135	100	
Net Block	285	106	122	91	100	
Capital Work-in-progress	74	25	16	166	100	
Investments	90	157	142	100	100	
Net Current Assets						
Current Assets, Loans	383	178	153	165	100	
& Advances						
Less: Current Liabilities	240	120	93	123	100	
& Provisions						
Total Net Current Assets	996	426	409	345	100	
Misc. expenses not written-o	off					
Total	252	127	130	116	100	

paced or even declined. Prominent among the items that have shown significant increase during this period are the secured loans, net block, reserves and surplus (with share premium being one of the reasons) and net current assets. Major items that have shown a decline are the investments, CAPEX and unsecured loans. Overall, the balance sheet has grown with the fuel for growth coming from both equity and debt sources. The financial leverage, liquidity, working capital management and other critical financial parameters can be further explored in the next stage of analysis.

Let us summarize the highlights of P&L A/C.

While sales increased by 3.7 times, the main direct expense—material consumed went up four-fold, reflecting higher raw material costs, which may be investigated further. Conversion expenses recorded a proportionately lower increase, as they comprised some fixed costs such as plant depreciation. Since COGS increased faster than the revenue increase, GP growth fell below the sales increase. This should caution the analyst and prompt an investigative questioning: Is it a strategy or the industry

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B. INDEXED TREND ANALYSIS OF INCOME STATEMENT								
Particulars	0203-(12)	0103-(12)	0003-(12)	9903-(12)	9803-(12)			
Sales	366	221	155	110	100			
Material Consumed	397	234	158	109	100			
Total Conversion Exp.	300	218	161	113	100			
COGS	381	232	158	110	100			
Gross Profit	309	181	143	110	100			
Selling Expenses	562	324	160	123	100			
Adminstrative Expenses	229	141	135	120	100			
Operating Profit	294	171	142	105	100			
Investment Income	228	113	193	184	100			
Other Income	1	1	3	9	100			
PBIT	268	153	141	111	100			
Financial Expenses	336	224	187	140	100			
PBT	245	129	126	102	100			
Tax Charges	1820	213	93	52	100			
PAT	181	126	127	104	100			

trend? What about the future? What is the guidance available in the market? What about the major competitors?

Selling expenses shot up by 5.6 times, suggesting extreme selling efforts, reasons for which may be established. This should prompt the analyst to dig a bit into the marketing tactics and strategies. The explanation for the lower increase in admin costs is the same as that of conversion costs. As indicated by the profit parameters such as OP, PBIT, PBT and PAT, the profitability growth did not catch up with the sales growth. This may indicate that the company is using favourable accounting tactics to boost the revenue growth—viz. including certain selling expenses as part of the sales, which are then charged off (in the P&L) under selling/other costs. Or the company is attracting more volume by compromising margins.

An accounting analysis during the period is also suggested. While investment income increased, the other income component dropped. Higher investment income need not be repeated as the balance sheet shows a drop in investment portfolio and probably higher investment income in 2002 is because of the sale of a significant portion of the portfolio, which may be confirmed by the analyst. Also, explanation for sharp increase in taxation may also be obtained.

Ratio Analysis

Ratio analysis is the most powerful and principal tool of financial analysis. Effective ratio analysis helps the analyst to look behind the numbers adroitly and link the

financial numbers to the business factors. Banks, term lending institutions, management, regulatory authorities, auditors, rating agencies, investors, business newspapers, magazines and many others rely on ratio analysis, depending upon the requirement. For instance, while the equity investors are concerned about earning per share, a term creditor/lender is concerned about debt service ratios. For credit risk analysis, the following ratio categorization, as shown in the following diagram, is among the best to study financial risks of a borrower/debtor, whether existing or prospective.



a. Financial Leverage Ratios: This set of ratios answers the most crucial information a creditor would like to know. How is the business funded? Is there an excessive reliance on external liabilities, with the owner either not willing to bring in sufficient funds or lacking financial capacity? How good are they at servicing the existing obligations? The major sub-set of the ratios under this category, as stated in the diagram are:

- 1. Short-Term Solvency Ratios
- 2. Long-Term Solvency Ratios
- 3. External Finance Ratios
- 4. Dividend Policy Ratios and
- 5. Cash Flow Ratios

b. Operational Ratios: Lenders and other creditors are interested in knowing how the business is performing. Is there adequate profitability? What is the level of various assets and how effectively are they managed? The operational ratios are further subdivided into—Performance Ratios, Profitability Ratios, Return on Investment Ratios, Asset Management Ratios, Leverage (Operating & Financial) Ratios and Cost-Volume-Profit Ratios.

c. Encapsulated Ratios: Given the profligacy of ratios, let us capture the essence of certain ratios, in three situations: (a) To provide useful connectivity among ratios (b) To predict the probability of financial distress and (c) To predict growth potential. Under this set come:

- 1. Dupont Model (Integrated view of ratios).
- 2. Prediction Power of Ratios.
- 3. Sustainable Growth Rate.

8.5 FINANCIAL LEVERAGE RATIOS

External liabilities such as borrowings, trade credit, accrued expenses and other external obligations act as a lever to boost the earnings of a business. As we have discussed in Chapter 1, financial leverage enhances RoE as long as the cost of leverage remains below the RoI. However, it increases financial risk because, unlike equity, external liabilities have specified due dates. The following ratios measure the financial risk involved, when a business decides to use financial leverage to boost returns.

Short-term Liquidity Ratios

A viable business can go bust because of liquidity problems. Hence, the importance of liquidity ratios.

a. Current Ratio (CR) = Current Assets / Current Liabilities

CR measures the ability of the firm to meet its short-term liabilities and generally, the higher the ratio the better. The following aspects should be borne in mind while relying on this ratio:

1. Industry & nature of business: Low CR need not mean liquidity problems in cashbased businesses and where the business is able to negotiate higher credit terms from suppliers, covering most of the operating cycle (see Chapter 10). However, in a normal case, low or falling ratios indicate trouble.

2. Quality of current assets: Just because the ratio is higher than the general norm of 1.50:1, it does not automatically mean that the liquidity is sound. Satisfactory quality of the underlying current assets (such as stock, debtors, etc) is a prerequisite. For example, even with a high CR of 5:1, a company may be facing liquidity problems if the entire stock has become obsolete due to technological innovation or if its debtors' portfolio comprises mainly non-paying customers.

3. Seasonal nature: Such businesses show wide fluctuations in working capital requirement impacting the current ratio. Hence the analyst should have a fair idea about the peak season and low seasons of the business. For example, sugar producers procure huge stock of raw material (sugarcane) during the harvest season while winter clothes manufacturers have a huge stock of finished goods at the onset of the winter.

4. Accounting policy: Changes can also boost CR. For instance, adopting a stock accounting policy that provides the highest stock valuation.

Low or falling current ratio can happen due to a variety of factors, such as: (a) Diversion of funds from the working capital to non-core or long-term activities (b) Using creditors and short-term bank finance towards long-term uses. This is usually a temporary measure, but the firm runs into difficulty if the anticipated long-term inflows do not materialize (c) Bad working management (d) Poor structuring of bank facilities, which allow the borrower to divert funds and (e) Overtrading, among others. In fact, CR should be studied together with working capital ratios and activity ratios because usually good working capital management means sound liquidity and vice versa.

b. Quick Ratio (QR) = [Current Assets – Stock – Prepayments] / Current Liabilities

This ratio gives a more conservative view of liquidity, by eliminating stock, prepaid expenses and other prepayments. Since stock-conversion into sales and then into debtors takes a long time, stock is excluded. Usually prepayments (prepaid insurance, etc) are not realizable in cash under normal circumstances, due to which they are also excluded. While the usual norm of minimum QR is 1:1, all caveats applicable for CR are relevant for this ratio. If there is significant difference between the QR and CR, it means the stock is significant. In case stock is directly convertible into cash (say 50% of total sales are cash-based), then that portion of the stock may be included in the numerator.

c. Cash Ratio = [Cash & Bank + Marketable Securities] / Current Liabilities

This is the most conservative view of the liquidity of a business. While the denominator remains the same, the numerator takes into account only those current assets that can be immediately converted into cash. In reality, other current assets that are certain to realize in cash immediately can also be considered for the numerator. For example, an inland (domestic) receivable covered by letter of credit is maturing the next day.

d. Defensive Interval Ratio (DIR) = [(Cash + Marketable Securities + Accounts Receivable) / Projected Cash Expenditures] × 365 days

This is another way of looking at liquidity. While current assets and current liabilities represent the future inflows and outflows of cash, DIR looks at the liquidity subject to two assumptions: (i) The present level of current liabilities will remain steady and (ii) No additional cash resources like bank finance or trade credit, owners' injection of funds or profit retention will be available. The denominator takes into account only cash-based expenses and excludes non-cash items such as depreciation and amortization. This ratio provides a conservative view as to how many days the business can survive with currently available quickest funds.

Long-term Solvency Ratios

A host of sources for capital exists—equity capital, preference capital, bonds, commercial paper, short-term loans, long-term loans, trade finance, suppliers' credit, factoring, discounting of bills, and so on. Financial leverage acts in favour of the shareholders as long as the business generates RoI in excess of the interest rates (as discussed in Chapter 1). Leverage ratios, discussed below, can reveal what the underlying financial policies pursued by the firm are—whether the firm follows aggressive or ultra-conservative style in managing its finances.

a. Gearing Ratio (GR) = Interest-bearing Debt / (Tangible Net Worth + Minorities + Non-redeemable Pref. Shares)

GR measures the firm's exposure to the interest-bearing debt in comparison to TNW. Normally, TNW should exclude all intangibles. However, if the analyst feels that some of the intangible assets such as trade marks, and brands, have real market value, then appropriate adjustments may be done, in which case both scenarios—one with and another without—are to be considered. Yet, it is again to be stressed that the conservative approach is better and all revisions should be based on strong logical reasoning. Similarly, if there

are convertible bonds maturing in the near term, again GR may be calculated in both scenarios—one treating converted portion of equity as part of TNW, and the other without. There are situations where the numerator should be adjusted for certain items, mainly off-balance sheet interest bearing financing. For example, in cases of off-B/S leased assets, the outstanding lease payable is to be factored into for correct GR. GR differs widely across sectors. For instance, generally capital-intensive industries tend to be more geared than service industries, but much of their debt is usually secured on specific assets.

High GR signals increased financial risk. High GR makes companies more vulnerable to business recessions/downturns than low-geared companies, as the higher interest burden literally becomes a burden. Interest costs become disproportionately heavier as profits decline. Secondly, high GR firms' ability to tap additional external sources is heavily restricted. For additional sources, they have limited options—surrender to the conditions of the lenders/beg for credit facilities/go bankrupt. The usual reasons for the increase in the GR are: (a) Disproportionately high increase in external borrowings vs. TNW (b) Substantial dividends or drawings by the owners (c) Over-trading and (d) Erosion of TNW because of the losses.

b. Debt/Equity Ratio (DER) = Total Outside Liabilities*/ (TNW + Minorities + Nonredeemable Pref. Shares)

* including non-interest bearing un-subordinated debt from internal parties (i.e. shareholders, etc)

DER is more comprehensive than GR. The interpretation of the ratio is more or less similar to GR. Higher ratios usually signal riskier entity. Highly leveraged entities can meet the obligations on time as long as their RoI remains higher than the implicit and explicit costs of leverage. However, once adversity sets in due to business cycles or otherwise, a crisis is inevitable. The analyst should be wary of situations where the GR and DER are moving in different directions. Drop in DER while GR records sharp increase indicates a situation where the entity relies more on interest-bearing debt, which might hint that non-bank creditors (suppliers, etc) are losing faith. Such warning signs should be explored further to confirm or dispel the hypothesis. As the balance sheets of certain companies are complex—especially those that are listed in the market and large in size—with a differing mix of financial instruments, the denominator and numerator given above have to be subjected to adjustments for conversion of certain liabilities into equity, or, crystallization of contingent liabilities, quantification of legal (e.g. income-tax) disputes, converting off-balance sheet items into on-balance sheet, etc.,—all based on strong logical reasoning.

c. Equity Funding of Assets = TNW + MI + NRPS / Total Tangible Assets

This ratio measures the funding provided by the shareholders (including minorities) and non-redeemable preference shareholders. Immediate debt conversions into equity may also be considered for computation purposes. Tangible assets are computed by deducting intangible assets from total assets. The higher the ratio, the lower is the risk level.

d. Interest-Bearing Debt Funding of Assets (IBDFA) = Total interest-bearing Debt / Tangible Assets

This is another way of looking at the level of interest-bearing external finance. While the GR compares the IBD with equity, this ratio compares it with the total assets. Lower the ratio, lower the financial risk, and vice-versa. However, increase in the assets through non-debt sources can bring down the ratio.

External Finance Ratios

Finance cost is the price of credit—relying on external economic resources, financial in nature. While the external finance cost is accounted in B/S and P&L on accrual basis, CFS reflects actual cash movements. Cash flow ratios are discussed later in this chapter.

a. Finance Costs to Sales Ratio = (Finance Costs Capitalized + Finance Costs charged to P&L) / Net Sales

YOY comparison will show whether the external financers are chunking away a major part of the sales value. Most of the businesses facing difficulty or on the verge of declaring bankruptcies usually find this ratio disproportionately high. Hence an increasing trend in this ratio is worth examination. ICR is not very useful in the case of loss-making firms while this ratio is useful under all circumstances. Moreover, from an economic point of view, it shows how much of the gross value generated is absorbed by external financiers.

b. Interest Cover Ratio (ICR) = Profit Before Interest & Tax (PBIT) / Finance Costs (include both capitalized and expensed)

Lenders and bankers are very keen on PBIT. It reflects whether the business generates enough profit to meet the interest service obligations. Traditionally, a ratio above 1.50X is considered as satisfactory. Higher the ratio, more comfortable the situation is. However, since PBITcan be influenced by accounting policy changes, it is better to use this ratio in conjunction with Interest Cash Cover ratio, which is discussed later.

c. Debt Service Coverage Ratio (DSCR) = EBIDA / (Interest + Instalments arising out of T/Ls or Finance lease)

This ratio measures the repayment ability of not only the interest portion but also that of instalments. Again, the higher the better.

Dividend & Equity Ratios

a. Payout Ratio = Dividends / PAT

All good companies pay dividends to shareholders. A creditor is interested in knowing how much of the profits are being paid as dividends. In case the ratio exceeds 1:1, the creditor should be wary and concerned if it shows a continuing trend, since it clearly indicates that the company is paying shareholders more than it earns as net profit (PAT).

b. Retention Ratio = (1 - Payout Ratio)

This is the reciprocal of Dividend Payout ratio. All healthy, and especially growing, companies ought to retain a part of the profits in the business in order to augment the resources. This ratio measures how much of the profit is retained in the business. If the external creditors remain the same, the retention leads to improvement of solvency ratios (and liquidity ratios, if the retained profit is kept in current assets or utilized to reduce current liabilities). Hence, from the creditors' point of view higher Retention Ratio is better.

Cash Flow Ratios

Cash flow ratios attempt to link various obligations and costs to understand the firm's ability to service them. Major cash flow ratios are discussed below:

a. Interest Cash Cover = Net Cash from Operations / Interest Paid

We have seen that ICR is calculated under accrual assumption and can be manipulated by accounting policy changes. So, even if the ICR is above 1.50X, in certain cases the firm may struggle to meet the finance costs obligations because of cash shortages. Interest cash cover ratio overcomes the limitation of the traditional ICR and shows how much cash from operations is available to meet the interest obligations.

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b. Short-Term Debt Cash Cover = (CFO* – Interest – Tax) / (OD + STL)

* CFO= Cash from Operations

This ratio measures the number of times Current Year (CY) operational cash flows after interest and tax cover short-term debt. Higher the ratio, the better. However, it is to be noted that the denominator comprises Short-Term Loan (i.e. working capital borrowings) which usually finances current assets such as stock and debtors. Accordingly, such STLs appearing in the balance sheet are normally repaid from the liquidation of such current assets, appearing in the same B/S. So, this coverage ratio can be considered as a conservative measurement basically reflecting the adequacy of cash flows and should ideally be studied for a historical trend rather than on a stand-alone basis.

c. External Debt Repayment Period (EDRP) = Total Interest-bearing Debt / Annual FCF* * FCF = CFO - Int - Tax - CAPEX

Unlike other cash flow ratios, the lower the ratio, the better is the situation. Note that the ratio is expressed in years. This ratio measures, given the CY FCF, how long it will take to repay the interest-bearing debt. Usually if EDRP exceeds 5 years, the analyst should be concerned and investigate further to ensure that the situation is under control. There ought to be sustainable factors for the firm to improve FCF in the future in such a way that the EDRP will decline in the future years—such as a strong brand, running down of new debt in future from certain future cash inflows (say expanded production), etc. This ratio should also be interpreted with care. For instance, an item of interest-bearing debt appearing in the B/S, such as convertible bonds, does not involve any repayment, but will be converted into equity. Normally, this ratio is very useful, especially from a trend point of view. A continued increase in the ratio is a warning sign. Either FCF is dwindling while debt is steady, or debt is increasing faster than the growth in FCF. In such a case the analyst should ensure alternative repayment sources in the balance sheet-such as unencumbered assets like investments and freehold land. A discerning lender will seek some of such unencumbered assets as security well in advance as the signs of trouble appear on the horizon.

d. Dividend Cash Cover = (CFO – Interest – Tax) / (Dividends Paid + Dividends Declared)

Dividend Cash Cover checks the adequacy of operational cash flows to meet the dividends. The higher the ratio, the more comfortable the position is. If the ratio is below 1, it means the dividends are being paid out of external finance or from non-operational sources. This should prompt the analyst to investigate the sources and check the dividend

policy of the firm. Are the dividends paid out of bank borrowings? If so, what about the impact on the financial leverage? Aren't the bank facilities properly structured? Isn't there any business requirement—say immediate replacement of fixed assets/expansion? However, among the exceptions, the case of growth companies deserves special attention. Because of their sales and volume growth, the need for additional working capital requirement steadily increases, resulting in working capital outflows. Consequently, the CFO will usually be thin or marginal, and if dividends are declared in such a situation DCC would be less than 1. In those cases, the analyst should check the retention ratio (mentioned above) in the business. If sufficient retention of profits is in evidence, a DCC of less than 1:1 may be considered as acceptable.

8.6 OPERATIONAL RATIOS

Performance Ratios

Performance ratios are needed for proper credit analysis because most of the coverage ratios mentioned above depend upon profits/internal cash generation, which in turn is a function of revenue and costs of revenue. Major performance ratios are:

a. Sales Growth/Decline = (Current Year sales – Last year sales) \times 100 / (Last year sales)

This ratio provides the direction in which the business has moved. With other things remaining the same, sales growth/decline impacts the profits, cash needs and internal cash generation capacity. It alerts the analyst to look for the reasons of growth decline/ stagnancy in business and a comparison with the industry to judge whether the business strategies are adequate. For bankers and other creditors, the sales growth means opportunities knocking at the door, as it usually fuels demand for further credit to finance inventory, receivables and other current assets.

b. Sales to Operating Capital Employed Ratio = Net Sales / Average Operating Capital Employed*

*Operating Capital Employed = Fixed assets + Current assets -Non-interest-bearing current liabilities. = Shareholders' equity + Interest-bearing debt + Non-curr. liabilities -Non-core assets.

AOCE is the average (viz.opening + closing / 2) of operating capital deployed in fixed assets and current assets, in the core business. This ratio captures the utilization of operating capital employed. Usually, increasing ratios indicate improving performance. To understand the changes in the ratio, the analyst should go back to the components of

the operating capital and sales. Some of the factors that contribute to the improvement in the ratio are: (a) Increase in sales (b) Economies of scale (c) Favourable change in trade terms—viz. trade creditors providing more credit period or the debtors settling promptly, etc. (d) New technology resulting in more efficiencies such as lower inventory level (e) Sale and lease back of assets (f) Management action of closing down certain branches, etc. Drop in the ratio is traceable to factors opposite to the above, such as inadequate working capital policies and ineffectual capital expenditures.

Changes in the ratio are to be interpreted carefully. Not all increases are positive and not all declines are negative. For instance, the ratio can be improved by delaying the payments to suppliers at the end of the accounting period. It can have disastrous consequences if suppliers react. Illiquidity position may also be another indication. Liberal credit sales will improve the ratio in one year, risking bad debts in the following years. A fall in ratio need not indicate a negative situation always. For instance, the ratio will fall in case of a recent capacity augmentation/diversification project or similar CAPEX, the benefits of which accrue in later years. Furthermore, a business pursuing high volume strategy will a have larger ratio than the one which follows high margin/low volume strategy. This highlights the need for the analyst to understand the nature of business as well.

Profitability Ratios

Profitability is the key to the survival and success of a firm. While occasional short-term losses are acceptable, continual losses are detrimental and will erode the capital structure, turning the balance sheet unhealthy, creating panic and sometimes prompting creative accounting. Major profitability ratios are:

a. Gross Profit Ratio or Gross Profit Margin (GPM) = Gross Profit \times 100 / Net Sales GPM examines the difference between the sales and cost of sales in relation to the sales. The importance of GPM is evident from the fact that a firm meets the expenses (i.e. selling, administration, finance, taxation, etc) from the difference (margin) it derives from the sales and COS. An improving ratio is always welcome and can be traced to: (a) Higher prices (b) Increased production efficiency (c) Lower input costs (d) Higher volume sufficient enough to bring in economies of scale (e) Weakening of local currency resulting in better value realization of exports (f) Change in stock valuation policy, such that the closing inventory value is inflated or reported at a higher figure (compared to the previous year method, and may amount to a creative technique) and (g) Change in the product mix (higher margin products, etc.,), among others. The

reasons for a falling ratio are just the opposite of the reasons mentioned above. Generally, the GPM under successful differentiation strategy is higher than that of a cost leader.

b. Operating Profit Margin (OPM) = Operating Profit × 100 / Net Sales

Operating profit refers to the profit after meeting selling, distribution and administration costs from the gross profit. OPM is also impacted by business strategies. While a company competing on low costs (cost leader strategy) will try to limit operating costs to the base minimum, a differentiator has to spent more on advertising, sales promotion, branding, etc. However, even with more operating expenses, a successful differentiation strategy should result in adequate OPM, because of the price premium—viz higher GPM.

Similarly, the nature of the industry and OPM are linked. Usually a food and provisions retailer will have low OPM while a manufacturer needs a higher OPM. This is because the retailer can generate adequate return on capital by clocking in higher volume. ie, a low OPM/high volume strategy. If the change in OPM is in line with that of GPM, then the reasons are the same as that of variations in the latter. Otherwise changes in the firm's policies and/or operational expenses are to be traced out.

c. Other Income to PBIT (Profit Before Interest & Tax) Ratio

This ratio indicates the level of the non-core income of the business. The higher the other income component, the lower the quality of PBIT. It indicates that the business is relying on non-core activity to boost the bottomline. Calculation of the ratio is evident from the name of the ratio itself.

d. Net Profit Margin (NPM) (or Return on Sales) = Net Profit / Net Sales

Net profit (profit available for appropriation) is the final profit to shareholders after meeting all claims of financers and tax authorities and minorities, among others. A lender financing the core activities is more concerned with operating profit ratio. However, adequate NPM in the long term is necessary to keep the owners interested in the business, which, otherwise, is a risk in itself.

Return on Investment (Rol) Ratios

Profitability ratios study profits and expenses at various operating stages but do not take into account the capital deployed to meet the expenses and purchase fixed and other

assets. Hence the importance of RoI ratios that relate the profits to the investments made to generate them. For our discussion, we rely on four major RoI ratios, each of

a. Return on Assets (ROA) = PBIT / Average Total Assets

which studies the rate of return of the business from different angles.

Some books call this ratio RoI itself. This ratio measures profit before interest & tax (viz. profits before settling the claims of debt-holders) to total assets (viz. Equity + Debt). It reports the effectiveness of the utilization of the capital (or assets) irrespective of the source of capital and hence can be considered an apt measure for inter-firm comparisons.

b. Return on Capital Employed = Operating Profit / Average Operating Capital Employed (AOCE)

Operating profit accrues from the core operations of the company. Operating capital employed means the *net assets* employed in the *core operations* of the business. For a lender, this ratio is important as it narrows the focus to the core operations of the company. What are core operations? Core operations to a lender are the operations he takes part in financing. This ratio is the product of two other ratios, which we have already discussed, and the relationship is evident from the following:

 $ROCE = OPM \times SOCE$

Changes in this ratio can be traced back to these two ratios, and from there, the underlying reasons can be ascertained. ROCE is influenced by profitability (OPM) and efficiency of the capital utilization (SOCE).

c. Return on Total Capital Employed = PBIT / Average Overall Capital Employed

ROTCE is a broader measure as PBIT takes into account the 'other income' component as well. The overall capital employed encompasses net assets plus investments (quoted, unquoted, including those in associates and subsidiaries) and other non-core current assets, etc., *(see the analytical B/S format given in the illustration for details)*. ROTCE measures the profitability from the point of view of all capital providers except current liability providers.

ROTCE is an important ratio because it shows the viability of the business quite explicitly. A low ratio can disappear in adversity caused by economy/industry/ company factors. Secondly, ROTCE should be higher than the borrowing costs (or cost of capital, in general) for the business to emerge successful. Otherwise, it cannot survive without outside support. The only major exception is the case of 'growth' companies

(which expand quickly) where OCE shows an increasing trend, pushing ROTCE lower due to the sizable investments in fixed and other assets. However, the gap between the ROTCE and Kd (Cost of debt) should ultimately narrow down with the former increasing above the latter, as future earnings should catch with the investment.

d. Return on Equity = Net Profit available to Equity Shareholders / Equity Shareholders' Equity

This shows the return on equity shareholders' funds and the reward for the risk-taking. By logic, it should be more than the risk-free return available in the economy. While a low or even negative RoE is acceptable for a short period, if RoE is consistently low, it means trouble for the survival of the business unless funds are infused. The best examples are the public sector institutions in India, which have been surviving on low or even negative RoE for decades! However, in the private sector such a scenario is rare, as prudent investors will wind up the business and with the capital salvaged, try alternative investments.

Asset Management Ratios

The assets in any business can be broadly classified into working assets (i.e. working capital) and fixed assets. Working capital is usually defined as stock + debtors-creditors while fixed assets refers to the building, vehicles, plant, equipment, etc. The following ratios capture the management of key assets of a business:

Stock Holding Period = (Average Stock*/ Cost of Goods Sold#) × 365 * year-end values may be used. # if related data is not available, sales may be substituted.

The stock policy of the company and effectiveness of inventory management have to be understood. The analyst, before deriving a conclusion, should have an idea about the industry norms. For example, a firm dealing in perishable goods should have a lower stock-holding period compared to a jewellery firm. Although a decreasing ratio is good because it indicates that the stock is moving fast and not piling up, experience and expertise are required to interpret this ratio, in the overall context of the firm. For instance, a firm facing liquidity crisis might not be able to replenish the stock towards the end of the accounting period, which can cause a drop in the average stock-holding period. But this cannot be considered a positive sign. Certain adjustments are suggested while calculating this ratio: (a) Exclude spare parts inventory if treated as stock and (b) Take into account the fact that unlike other components of the working capital, the stock is influenced by the valuation policies adopted. The analyst should ensure that changes in the accounting policy, if any, are not done for any cosmetic purpose.

b. Debtors' Collection Period = (Average Trade Debtors* / Credit Sales) × 365 * year-end values may be used.

If data of credit sales is difficult to obtain/estimate, the total sales may be used instead. A comparison of this ratio against the normal credit terms extended by the firm is highly useful in determining: (a) The efficency of collections and (b) Whether the credit policy on credit sales is realistic. A decreasing ratio generally indicates efficiency and improvement, while an increasing ratio is a matter of concern as it may signal impending bad debts. Some of the reasons behind a decreasing ratio are: (i) Incentivized salesmen (ii) General improvement in the liquidity conditions (iii) Incentives to the customer to pay up soon (iv) Shift in sales policy to LC terms from clean (or open) sales (v) Screening away of bad and small customers (vi) General improvement in the industry (vii) Tightening of credit by the company, etc. The common reasons for the increase in the ratio are the converse of the above. Certain adjustments are needed while calculating this ratio: (a) Exclude debtors arising out of transactions other than sales (core business) and (b) Include discounted debtors¹ with recourse.

c. Trade Creditors Payment Period = (Average Trade creditors[#] / purchases^{*}) × 365 [#] year-end values may be used. ^{*} Cost of Goods Sold (or sales) if figure is not available.

Trade creditors' payment period indicates: (a) Extent of reliance on suppliers' credit, (b) Whether trade dues are being settled on time and within the credit period extended, and (c) An idea about the credit standing of the business in the business community. Before deriving conclusions based on this ratio, the analyst should ascertain the industry norms. Any discrepancy in industry norms and the credit terms enjoyed by the customer calls for an investigation. Usually new businesses get a shorter credit period till their reputation is established. A falling ratio indicates that the company is becoming more liquid and less reliant on creditors, though this may also indicate poor working capital management or credit period is allowed by the suppliers while illiquid companies are also forced to stretch the creditors. *[Average payment period can be calculated for major inputs*]

¹ Discounting of debtors is akin to bill discounting by banks and other financial intermediaries.

other than material suppliers. For instance, in the case a manufacturing company with heavy electricity consumption (such as aluminum furnace) the electricity arrears are to be compared with the actual annual electricity consumption costs.]

d. Working Capital to Total Assets Ratio = Working Capital / Total Assets

The higher the ratio, the more significant the working capital for the business. Also, it highlights the nature of the business. Cash-based businesses such as restaurants, retailers and supermarkets have either a low ratio or even negative ratio. Manufacturing companies have medium to high ratios. Wholesalers, service contractors, etc., have rather high ratios in view of their low fixed assets requirement. Generally a falling ratio indicates improved efficiency of working capital management and vice-versa. A decrease in ratio occurs due to reasons such as: (a) Higher reliance on suppliers' credit (b) Increase in fixed assets (c) Strict credit terms to customers (d) Improved stock management (e) Tight liquidity which pressurizes the business to squeeze working capital, etc. Higher ratio may be due to factors like: (i) Reduction in trade credit, indicating reliance on alternative sources including banks (ii) Sale and lease back of fixed assets, (iii) Poor debtors' collection and (iv) Inadequate stock management.

e. Working Capital to Sales Ratio = Working Capital / Sales

The higher the ratio, the higher the effort, in terms of cash deployed in stock, debtors, etc., needed to generate sales. This ratio, which measures the money invested in net current assets to sales, indicates the efficiency of the working capital policy in generating sales. Cash-based businesses may have a negative ratio, which indicates that the credit period offered by the suppliers exceeds the stocking period while sales are on cash (negligible debtors). While a falling ratio is always welcome as it indicates improved efficiency of working capital management there are certain exceptions such as: (a) Tight liquidity which pressurizes the business to stretch creditors or non-replenishment of stock, which will bring down the ratio and (b) Overtrading, where an undercapitalized firm seeks rapid sales growth, which results in keeping funds in working capital as low as possible.

f. Fixed Assets Utilization Ratio = Sales / Fixed Assets

The higher the ratio, the better. Low ratio signals dismal or under-utilization of fixed assets. Usually, increasing trend in the ratios indicates improving performance. However, care should be taken if leased assets are present. In such cases, sometimes the leased assets may not be factored into the balance sheet, although utilized in the

business, which in turn depresses the denominator, resulting in a higher ratio, which would not have been the case otherwise.

g. Fixed Assets to Total Assets Ratio = Fixed Assets / Total Assets

Higher the ratio, more significant is the fixed assets for the business. It highlights the nature of the business. Manufacturing and real estate businesses have a high ratio while service industries generally have a low ratio. Generally a falling ratio indicates fixed assets getting depreciated as they get older, which may suggest immediate replacement or effective maintenance needs. The analyst may undertake an inspection of the fixed assets, if required.

h. Average Depreciation = Depreciation for the Year / Fixed Assets

In normal situation, this ratio should not show significant variation. Big variations highlight depreciation policy changes.

Leverage (Operating & Financial) Ratios

Does a doubling of sales always result in doubling of net profit or is the change in net profit disproportionate to sales? These are answered by leverage ratios: (a) Operating Leverage (Activity Leverage) and (b) Financial Cost Leverage.

a. Activity Leverage (or Operating Leverage) = (Sales – Variable Costs) / Operating Profit

Depending upon the nature of the activity undertaken and the business policies of a firm, the cost structure differs from firm to firm. While fixed costs (FC) do not vary with sales, variable costs (VC), do. Operating leverage tends to be high for a business with high fixed costs. Increased FC is risky because these costs exist even when demand drops and the revenue stream dries up. However, at high levels of sales, high FC results in enhanced profitability as is evident from the following example:

Example: Suppose ABC Ltd and XYZ Ltd are operating in the same industry, with the latter relying more on automation as reflected in the cost structure given below:

			(Rs. In Millions)
Particulars	ABC Ltd	XYZ Ltd	
Fixed costs	3	50	
VC/Sales	85%	40%	
Assets	200	200	

Let us examine how the cost structure impacts each company under three scenarios with sales of 50M, 100M and 200M.

		ABC		XYZ			
Sales Scenarios	Low sales	Medium	High	Low sales	Medium	High	
Sales	50	100	150	50	100	150	
VC	42.5	85	127.5	20	40	60	
Contribution	7.5	15	22.5	30	60	90	
FC	3	3	3	50	50	50	
OP	4.5	12	19.5	-20	10	40	

As is evident from the above, the downside risk is less for a low operating leverage entity while the one with high operating leverage enjoys substantial advantage during a high demand period. XYZ attains a net profit of \$40 M when sales are high, but during the low sales period it suffers loss. Many managements structure their costs emphasizing on fixed costs, desiring maximum profitability. This sometimes can bring woes, especially in the event of low sales. Operating leverage measures the impact on operating profit arising from the cost structure. The OL for ABC and XYZ is calculated below:

		ABC		XYZ			
Sales Scenarios	Low sales	Medium	High	Low sales	Medium	High	
Operating Leverage	1.67X	1.25X	1.15X	NA	6X	2.25X	

The OL is low for ABC given its low fixed cost base, while XYZ's is high, implying significant gains when revenue is substantial. The higher the ratio, the more risky the OL structure the firm has. While it captures the risk involved in the cost structure, it also explains changes to the Operating Profit—why or why not the change is not in the line with that of sales trend.

b. Financial Cost Leverage (FCL) = Operating Income / Net Profit

Earlier, we discussed certain ratios (GR, DER, etc) that gauged financial risk. Let us now examine a ratio that links the impact of the financial leverage to the bottomline.

Example: Let us continue the above example and assume that ABC Ltd is conservative and borrows only 10% of the asset requirement, while XYZ Ltd is more

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risk-taking and funds 50% of its assets by debt. Assume cost of debt is 7.5%. Let us see the impact of financing costs:

Assets funded by	ABC	XYZ
Equity	180	100
Loans	20	100
Total Assets	200	200

Let us examine how the external finance cost impacts the bottom line under three scenarios—with sales of 50M, 100M and 200M.

	ABC			XYZ			
Sales Scenarios	Low	Medium	High	Low Sales	Medium	High	
OP	4.5	12	19.5	-20	10	40	
Interest	1.5	1.5	1.5	7.5	7.5	7.5	
NP	3	10.5	18	-27.5	2.5	32.5	

FCL measures the impact on net profit arising from the external finance structure. FCL for ABC and XYZ is calculated below:

	ABC			XYZ		
Sales Scenarios	Low	Medium	High	Low Sales	Medium	High
FCL	1.50X	1.15X	1.08X	NA	4X	1.23X

While ABC Ltd is able to retain profitability with low financial leverage, XYZ attains the best performance in periods of high demand. However, at times of recession or low sales, the higher levels of financial leverage erode shareholder value, as is the case of XYZ Ltd in the first scenario.

c. Total Leverage = $TL = OL \times FL$

If both ratios are high, TL will also be high, signalling higher risks involved with the firm. It has heavy fixed costs and a high financial burden, which makes it compulsory to operate at higher levels to survive. Credit executive should be wary about such entities, unless they have strong competitive advantages such as monopoly or enjoy large economies of scale etc.

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Cost-Volume-Profit (CVP) Ratios

Profit depends upon a large number of factors, primarily the selling price of the output, cost of inputs and the volume of sales. All these factors are interlinked. Analysis of these three factors enables the analyst to understand the effect of the costs on volume and impact of price/output fluctuations. Let us examine two CVP ratios that will lead the analyst towards in-depth understanding.

a. Break-Even Point: It measures the critical level where a business entity is about to make profits. It not only shows at what level the business will be profitable, but also shows what level of operation should be maintained to avoid losses.

Formula 1.: BEP (units) = Total Fixed Costs / (Unit Selling Price – Unit Variable Cost)

If selling price per unit and variable cost per unit are not available, it can be computed by the following formula. However, note that the following equation provides the break-even in value terms (not in terms of units/output).

Formula 2.: BEP (value) = Total Fixed Costs / Contribution Ratio Where Contribution Ratio = (Total sales - Total variable cost) × 100 / Total sales.

Usually if fixed costs are on the higher side, BEP will also be higher and the operating leverage is also relatively high, and vice-versa. This does not mean that higher fixed costs are bad, because at optimum or full capacity utilization levels, higher fixed costs tend to maximize returns. For instance, most of the petrochemical plants are capital-intensive, with resultant higher fixed costs, but are of sound profitability, as they operate at optimum capacity levels.

Example: The fixed costs of a manufacturing company are \$100,000 a year. The variable cost is \$25 per unit and each unit may be sold for \$75. *How many units must be sold in order to break-even?* The gross profit or contribution to profits, per unit, is 50 (= 75 - 25). The break-even must therefore be 2,000 units (= 100,000 / 50). If more than 2,000 units are sold then the business will make a profit, otherwise it will suffer a loss.

b. Margin of Safety (MOS) = Sales – BEP sales (or Volume in units – BEP in units)

This is the difference between break-even level and current level of sales (volume) if the firm is profitable. On the other hand, if the firm suffers losses, it shows additional sales or volume required to reach the safety level (viz. break-even level).

8.7 ENCAPSULATED RATIOS

We have discussed numerous ratios. Given the proliferation of ratios, a user may get lost in the details, missing the woods for the trees. Encapsulation of ratios to gauge a specific situation, such as probability of bankruptcy, etc., or a comprehensive picture (through the Dupont Chart) is possible. Three such situations are given below.

Dupont Model

This model provides an overall view of the ratios and the interconnection among them. To get an overall picture, an integrated approach is ideal along with the study of individual ratios. Dupont Company of USA introduced a system of financial analysis interlinking the financial ratios, which show how the major ratios computed so far (except cash flow ratios) are connected by an analytical chart:

The left hand side of the chart in Fig 8.2 is SOCE, and its component ratios have been discussed in detail earlier. Fixed assets turnover ratio, inventory holding period, receivable collection, and creditors' payment ratio, among others, provide a deeper insight into how changes in each category have impacted ROCE. It highlights how ROCE can be improved by pursuing different policies for utilizing (reduce stock holding, etc) the assets.



Fig. 8.2 An analytical chart showing how the major ratios are linked.

The right hand side of the chart is OPM, and its component ratios have been discussed in detail earlier. It provides insight into the cost management and how cost control measures will impact ROCE. The establishing of inter-relationships among the productivity and efficiency is meaningful in comparing YOY performances and carrying out inter-firm comparisons in a meaningful manner in the shortest span of time.

Predictive Power of Ratios

Do ratios have this magical power? Can they predict the future of a business? One of the perpetual worries of a creditor is the possibility of a borrower going broke. Several studies have been conducted in this direction, among which Prof. Edward I. Altman's Z-Score Model is well known. Z-Score predicts the likelihood of a firm going bankrupt. Z-Score is calculated as given below:

Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 0.1X5, where

X1 = Working Capital / Total Assets
X2 = Retained Earnings since inception / Total Assets
X3 = Profit Before Interest & Tax / Total Assets
X4 = Market Value (M.V) of Equity / BV of total debt
X5 = Sales / Total Assets

The interpretation is as follows:

Z-Score > 2.8	= Low or Negligible Risk of bankruptcy
Z-Score < 1.8	= Very High Risk of bankruptcy
1.8 < Z-Score < 2.8	= Moderate Risk of bankruptcy*
	* Altman calls this region an area of uncertainty, as the company can go either way.

According to Altman, the Z-Score can predict with 95% accuracy the possibility of a business going bankrupt in a year and 72% within two years. Altman had studied 33 bankrupt firms along with a paired sample of 33 non-bankrupt firms and examined 22 ratios, based on which he identified the above mentioned five ratios.

However, Z-Score has faced the following criticisms: (a) It is more useful in the US context (b) It uses total assets as the denominator, in three of the five ratios. Hence, an analyst should take care to exclude all intangible assets, which do not have a value unless the firm is a going concern, while calculating the ratios, and (c) There is a lack of emphasis on liquidity, since it is illiquidity than ultimately leads to

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bankruptcy or insolvency. (Later researchers like Tafflan, evolved ratio-based bankruptcy models emphasising the current assets and liabilities, but these did not seem to act as a better indicator. Some companies which these model predicted as safe collapsed, and vice-versa.)

Also while 95% predictability one year ahead is fair enough, usually all troubled companies publish their accounts quite late, reducing the practical use of this score.

Despite the criticisms, ratio-based predictions are commonly used in the financial world. While certain ratios such as Altmans, Tafflier, LC Gupta, etc., are published, many such models remain proprietary and are not disclosed to the public. Z-score models are used routinely by most large financial institutions and accountancy firms. They may be used to: (a) Get an idea of the probability of trouble ahead (b) Track a company's progress over time and (c) Compare companies of similar sizes in the same sector of industry.

Growth Potential

Creditors, especially lenders, often are interested in knowing about the rate of growth of their customer's business. Ratio analysis can provide a strong hint about the sustainable growth rate computed as:

= RoE (1 – Dividend Payout Ratio)
= RoE (1 – (Dividends Paid / Net Profit))

Example: Suppose PQR Ltd has an RoE of 24.2% and the dividend payout ratio is 11%. Its sustainable growth rate is 21.5% (24.2 × (1 - 0.11)).

The interpretation of this ratio should not be rigid because dynamic external and industry factors can act upon the profitability (and in turn, the RoE) while the firm can alter its financial/dividend policies altering sustainable growth. The importance of sustainable growth lies in the fact that it helps the analyst to understand the funding pool internally available for doing the additional business it wants to do. If the firm wants to grow faster than the sustainable rate, it means some of the drivers (payout, profitability, which can be broken up into cost/asset productivity ratios or financing policies) would have to change.

ILLUSTRATION

Your are provided with following balance sheet, profit & loss account and cash flow statement of ABCD Ltd prepared in analytical format.

Customer Name	: ABCD LTD	UNITS: THOUSANDS		
Financials -Date : 31Dec2001		31Dec2002		
Financials -Type	: AUDITED(12months)	AUDITED (12months)		
BALANCE SHEET		31Dec2001	31 Dec 2002	
CORE ASSETS				
Land & buildings		249,572	249,594	
Construction in Progres	SS	2,744	7,592	
Plant & Machinery		189,892	194,166	
Furniture & Fixtures		72,952	71,580	
Vehicles		14,339	11,788	
Less: Accumulated Dep	preciation	(307, 198)	(320,054)	
TOTAL FIXED ASSE	TS	222,301	214,666	
Stock		309,806	272,547	
Trade Debtors		366,246	308,547	
Finance Lease Receival	oles (Curr.)	18,728	28,702	
Other Debtors		27,988	28,357	
Cash & Near Liquid Fu	nds	31,873	31,623	
Prepayments		8,787	9,763	
Less: Trade Creditors		(217, 121)	(230,476)	
: Other Creditors		(153,728)	(126,892)	
Less: Dues to Related (Cos	(12, 299)	(16,923)	
: Taxation		(12,189)	(8,617)	
OPERATING CAPITAL EMPLOYED		590,392	511,297	
NON-CORE/NON-C	URRENT ASSETS			
LT lease receivable		8,848	10,718	
Investments in Subs/As	SOC	55,226	55,734	
Dues From Related Co	S	7,547	4,386	
TOTAL NON-CORE	/NON-CURRENT ASSETS	71,621	70,838	
OVERALL CAPITAL	EMPLOYED	662,013	582,135	
CAPITAL STRUCTU	RE			
Ordinary Share Capital		20,000	20.000	
Profit & Loss Account		98,278	61,549	
Other Reserves		35,080	36,303	
Contribution from Shareholders		202,248	202,248	
Less: Intangibles		(12, 112)	(9,620)	
TANGIBLE NET WORTH		343,494	310,480	
Minorities		53,422	62,929	
Provisions/Other L/T I	Liabilities	61,790	56,445	
TOTAL		115,212	119,374	
			•	

Chapter 8: FINANCIAL RISKS

EXTERNAL FINANCE		
Bank O/D & Short-Term Loans	203,307	152,281
OVERALL CAPITAL EMPLOYED	662,013	582,135
CONTINGENT LIABILITIES	101 000	131 977
CAPITAL COMMITMENTS	52 500	50,000
	02,000	00,000
PROFIT & LOSS ACCOUNTS		
Sales	1,446,791	1,469,762
Less: Cost of Goods Sold	(1,117,664)	(1,132,857)
GROSS PROFIT	329,127	336,905
Less : Distrib. & Selling Costs	(156,049)	(160,370)
: Administration Costs	(114,623)	(106,887)
OPERATING PROFIT (LOSS)	58,455	69,648
Share of Profit (Loss) of Ass.Cos	2,030	10,059
Other Income (Expense)	24,819	13,703
PROFIT (LOSS) BEFORE INT & TAX	85,304	93,410
Less: Interest Expense	(7,619)	(4,777)
PROFIT (LOSS) BEFORE TAX	77,685	88,633
Less: Taxation Charge	(6,500)	(6,500)
PROFIT (LOSS) AFTER TAX	71,185	82,133
Minorities	(11,976)	(16, 583)
PROFIT(LOSS) AVBLE FOR APPROP	59,209	65,550
RECONCIL, RET'D PROFITS (LOSSES)		
Profit(Loss) Avble for Approp	59,209	65,550
Less: Dividends Paid & Proposed	(100,000)	(101.056)
Adi/Tfrs (to)/from Reserves	(705)	(1.223)
RETAINED PROFIT FOR YEAR	(41.496)	(36,729)
Profit & Loss B/Forward	139.774	98.278
TOTAL REVENUE RESERVES	98,278	61,549
CASH FLOW		
OPERATING CASH FLOW		
Operating Profit (Loss)	58,455	69,648
Depreciation/Amortization Charges	29,421	32,767
ADJUSTED CASH FLOW FROM OP'S	87,876	102,415
WORKING CAPITAL MOVEMENT		
(Inc)/Dec in Stock	(34, 692)	37 259
(Inc)/Dec in Debtors	9.421	(7.214)
Inc/(Dec) in Creditors	28 665	(8 723)
Other Net Working Can Movement	20,000	(0,720)
NET CASH FLOW FROM OPERATIONS	91 270	123 737
Less: Taxation Paid	(1.660)	(10.072)
Less: Interest Paid	(9.659)	(4.688)
NET FREE CASH FLOW FROM OP'S	79 958	108 977
Less: Dividends Paid	(105 361)	(58 087)
Less: Other Cash Outflow	(5 09 2)	(8 278)
NET C/F BEFORE INV CRP & FIN ACT	(31 396)	49 519
THE OF THE ONE HAVE ONE WITH ACT	(01,020)	42,012

CASH FLOW FROM INVESTMENT & GROUP			
Net cash from Fixed Assets	(21,747)	(25, 562)	
Net Cash from Investment Act	14,746	13,995	
Net Intra-Group Funds Flow	0	0	
Other	30,059	19,236	
NET C/F BEFORE EQUITY & FIN. ACT	(8, 268)	50,181	
CASH FLOW FROM EQUITY & FIN. ACT			
Inc/(Dec) in Equity	0	0	
Inc/(Dec) in S.Term Debt	5,766	(51,026)	
Inc/(Dec) in L.Term Debt	0	0	
Other	873	595	
NET C/F FROM EQUITY & FIN. ACT	6,639	(50,431)	
(Inc)/Dec Cash & Nr Liquid Funds	1,629	250	
TOTAL	8,268	(50,181)	

Additional Information:

- Turnover comprises: Equipment & Automotive 286.8M, Consumer Products 714M Industrial Products 298M and Office Equipment 171M.
- Represents global brands such as TOSHIBA, XEROX, KITKAT and FIRE-STONE.
- Largest inventory item was Trading Inventory & Finished Goods, which towards 2002-end, decreased to SAR 191M (SAR 222M as at 31.12.01).
- Shareholders had purchased long-term Govt. Receivables, amounting to 49M of a group company to improve its cash flows.
- Sales growth of 2002 is almost in line with the previous years. Opening Operating Capital for FY2001 was 611M.

You may calculate major financial ratios and prepare an analytical report deriving the financial risk involved. Structure your report covering performance, profitability, W/C management, liquidity & cash flows.

Suggested Solution

The solution is derived in two steps. First the major ratios are computed. Thereafter, an analysis report is prepared, stressing financial highlights and ultimate financial risk involved.

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Chapter 8: FINANCIAL RISKS

I. RATIOS		
A FINANCIAL LEVERAGE RATIOS	31-12-2001	3-12-2002
Short-Term Solvency Ratios		
Current Ratio	1.28	1.27
Quick Ratio	0.74	0.74
Interval Measure (days)	8	
Long-Term Solvency Ratios		
Leverage	1.80	1.75
Gearing	0.51	0.41
Finance Costs Coverage	11.20	19.55
Finance Costs Cash Cover		31.56
Cash Flow Ratios		
Interest Cash Cover	9.45	26.39
Short-Term Debt Cash Cover	0.39	0.71
Dividend Cash Cover	0.75	1.87
External Debt Repay Period	2.5	1.4
B OPERATING RATIOS		
S 1 C 4		00/
Sales Growth	0.07	2%
Productivity (Sales to Av. Operating Capital)	2.27	2.67
Profitability Ratios		22.00
GPM	22.7%	22.9%
OPM	4.0%	4.7%
NPM	4.9%	5.6%
Return On Investment Ratios*		
ROCE	9.72%	12.6%
OROCE	_	15.0%
ROE	_	20.0%
Asset Management Ratios		
W/C to Sales Ratio	5.7%	10.5%
W/C to Total Assets Ratio	15.6%	15.0%
Stock Turnover (days)	101	88
Dr. Collection (days)	92	77
Cr. Settlement (days)	71	74
Fixed Assets Utilization	6.51	6.85
Operating Leverage Ratios		
OLE	11.37	9.72
FLE	0.75	0.79
TLE	8.55	7.64
Cost-Volume-Profit Ratios		
Breakeven Sales (to cover SG&A O/H)	1,189,832	1,165,920
% to the Actual Sales	82%	79%
Breakeven Sales (Incl. Interest Exp.)	1,223,324	1,186,760
% to the Actual Sales	85%	81%
Growth Ratios		
Net Profit Growth		11%
Operating Capital Growth		-13%
I O I		

* Average



Financial Analysis Report

Performance

Breakdown of the turnover, which is characterized by moderate growth with low levels of fluctuations indicative of the relatively mature markets for many of the products manufactured/traded in by group companies, is given below:

Particulars	2002	Percentage to the total
Equipment & automotive	286.8	19.5%
Consumer products	714.8	48.6%
Industrial products	298.0	20.3%
Office equipment	170.2	11.6%
Total	1,469.8	100%

The consumer products segment was the largest, and accounted for about 48.6% of the total turnover. Overall the turnover is derived from diversified activities

Chapter 8: FINANCIAL RISKS

(represented by sixteen entities mentioned above) which offer some protection against severe turnover fluctuations. ABCD entities and subsidiaries represent leading global brands such as TOSHIBA, XEROX and KITKAT. Accounting policies comply with GAAP.

Profitability

GPM remained almost identical to that of the previous year at 22.9% (22.8% in 2001), reflecting continuation of similar overall profit margins. GPM continues to be at satisfactory levels, given the diversified nature of ABCD. Marketing expenses, which increased by 3% to SAR 160M (2001: SAR 156M) is justifiable as it remained around 10.9% of the turnover. However, effective cost cuts were attained in admin expenses, which were reduced by 7% to SAR 107M (SAR 115M in 2001). Taken together, selling & admin costs show a reduction of SAR 4M. This, coupled with better GPM, has resulted in an improved OPM of 4.74% (2001: 4.04%).

Sales to Operating Capital Ratio had improved to 2.67X (2001: 2.41X), which reflects improved productivity of the group. This is traceable to improved FA utilization (better sales to fixed asset ratio) and favourable changes in terms of trade (see W/C Management). Despite marginal improvement in GPM and volume, ROCE recorded rather significant improvement to 12.64% (2001: 9.72%), traceable to the better asset productivity and successful cost reductions.

ABCD's share of profit in the associates stood at SAR 10.06M, while other income, SAR 13.7M, includes foreign exchange income of SAR 1.6M (2001: SAR 2.1M) and interest income (mainly on instalment sales) of SAR 4.6M (2001: SAR 5M). More information is not available. Interest expenses decreased to SAR 4.8M (SAR 7.6M in 2001) due to the lower average interest rates and reduction in bank borrowings. Interest coverage ratio and interest cash cover, which improved to 11.2 X and 26.4X (4.89 X & 9.5X in 2001) were highly satisfactory. The tax charges had absorbed SAR 6.5M (2001: SAR 6.5M).

After providing for the Minority Interest (SAR 16.6 M vs. SAR 11.98M in 2001) in subsidiaries, ABCD ended FY2002 with a 11% increase in the net profit to SAR 65.6M compared to SAR 59.2 M in the previous year. Improved efficiencies and productivity resulted in a satisfactory RoE of 19.4%.

OLE is on the higher side, reflecting the relatively substantial fixed costs. However, prudently, the FLE is kept on the lower side, impacting TLE, which stood at a reduced level compared to OLE. Also, note that BEP levels are high, again reflecting the fixed costs of ABCD.

Working Capital Management

Stock: Comprises trading items (food items, office appliances, etc) and inventory for the factories. During the past five years, the stock-holding period remained almost steady around three & half months. Largest inventory item was trading inventory & finished goods, which towards 2002-end, decreased to SAR 191M (SAR 222M as at 31.12.01) reducing the average holding period to 88 days (101 days in 2001). Overall, the inventory management continues to be satisfactory. Trade debtors: The collections improved as is evident in the decrease of average collection period to 77 days (92days in 2001). One of the main reasons was the purchase of receivables, amounting to SAR 49.2M by shareholders. Overall, the average collections period is satisfactory, taking into account the diversified nature of ABCD. Trade creditors: Average creditors' payment period of the group increased to 74 days (2001: 71 days) which indicates more reliance on suppliers' credit, and can be considered as one of the methods used by ABCD to bring down bank borrowings. The past five-year trend shows that on an average ABCD enjoyed around two & half months credit from its suppliers. Short bank borrowings: Were reduced by SAR 51M, primarily from the cash flows from favourable change in terms of trade. As mentioned above, while the stock-holding period and debtors' collection dropped, the payment period to creditors had increased.

Liquidity & Cash Flows

Satisfactory liquidity with cash flow driven by moderate sales growth, steady operating margins and satisfactory working capital management. Current & quick ratios remained almost identical at 1.27:1 & 0.74:1 respectively (1.28:1 & 0.74:1 as on 31.12.01) reflecting continuation of adequate liquidity.

Cash flows continue to be stable and adequate to meet the business and owners' withdrawals. Most of the cash flows originate from low-risk business segments such as consumer products, suggesting sound quality of cash flows as well. While adjusted cash from operations improved to SAR 102M due to better profitability and higher non-cash charges, the net cash from operations stood at SAR 123.7M, as favourable changes in terms of trade, released working capital. Net cash from operations is historically positive, reflecting the inherent strength of operational cash flow. Investment inflows include dividend income of SAR 10.4M. Dividends outflow of SAR 58M comprise SAR 50 M to shareholders and balance to minority interests. Other major cash outflows were the net addition to the fixed assets, SAR 25.6M and interest payments, SAR 4.7M. Cash generation has historically been adequate to cover all priority outflows. Coverage

ratios are satisfactory, with interest coverage of 26x and a low debt repayment period of 1.4 years.

Capital Structure

TNW declined to SAR 310.5M (SAR 343.5M in 2001) because of the dividends in excess of the net profit for the year. Contributions from shareholders, which have been made to meet the working capital requirements of ABCD & subsidiaries, are interest-free and have no repayment schedule. While this is classified as a TNW item by auditors, the nature of this item is identical to that a shareholders' loan, subordination of which is ideal. During 2002, gearing & debt/equity ratios declined to 0.41:1 & 1.58:1 respectively (0.51:1 & 1.66:1 as on 31.12.01) and reflect rather moderate financial leverage. External debt usage is well controlled, given the relatively stable operating environment with low capex/incremental investment requirements. Debt/EBITDA ratio has improved to 1.53x from 2.38x on account of reduction in ST debt and higher EBITDA levels. High dividend pay-out in 2001 and 2002 (169% and 155% of distributable annual profit respectively) has resulted erosion of P&L reserves. However, in view of sustainable profit margins, low leverage levels and strong competitive position, this is considered acceptable.

CONCLUSION

Z score is well above the cut-off of bankruptcy. The sustainable growth rate is negative because the dividends exceeded the profit for the year and without any retention. However, overall financial position is considered strong with good balance sheet structure and strong income statement. The outlook for ABCD is stable, given its diversified nature and strong brands. While the collection risk in certain categories of debtors' portfolio (such as govt receivables and instalments) and substantial dividends are somewhat disturbing, overall *financial risk can be classified as low* given its strong capital structure, moderate leverage, adequate profitability and quality internal cash generation.



Integrated View of Risks

In the modern world, as we have seen in Chapter 1, credit is pervasive and inexorable. From the local retailer/financier to multinational banks/manufacturers and multilateral financial institutions, credit holds sway. The credit risk model we have discussed in Chapters 5 to 8 comprehensively covers all the significant components of credit risk at an entity level. Having covered all External, Industry, Internal and Financial (EIIF) risks, an integrated view is to be taken to arrive at the correct credit risk involved.

9.1 RELEVANCE OF AN INTEGRATED VIEW

The division of credit risk into EIIF risks facilitates indepth study of the credit risk and covers all factors that impact the creditworthiness of a business firm. It should be borne in mind that it is seldom the case that a single condition causes failure, but rather a combination of factors. EIIF risks should be viewed together because often two or more of EIIF risks work together to trigger a business collapse. For instance, a foray into new markets/sectors in which management lacks experience/competence, coupled with high leverage is almost a sure recipe for disaster. An integrated view is also important to identify appropriate tools to mitigate risks. For example, if financial leverage is skyrocketing, the creditor can impose strict financial covenants as one of the mitigants.

9.2 JUDGMENT

It is not unusual that credit risk executives, after unearthing EIIF risks, find it difficult to integrate them and arrive at a proper credit decision. EIIF analysis highlights a lot of pluses and minuses vis-a-vis the creditworthiness of the business firm under study.

Usually most of the minuses can be considered as risks. In most cases, the pluses act as mitigants or lend comfort to the creditor, although at times they may turn into risks, especially if there is a change in scenario. For instance, while huge capacities bring in economies of scale, if economic recessions cause lower demand, huge capacities pose the risk of significant underutilization with predictable consequences—viz. fixed costs remaining the same despite fall in revenue.

Every time a space craft takes off, about a hundred or so 'mission-critical' risks are involved. While hundreds of successful sorties of space missions are completed, the loss of space shuttle Endeavour in Feb 2003 due to the damaged protective coating was one among such 'mission-critical' risks playing out. Likewise, in the world of credit risk too, despite all safety measures, things can go wrong. The risks that stare at the credit executive in the face of a credit decision can be extremely challenging, often impacting the reputation of the decision-taker.

The approach advisable is to akin to a judge or jury bench, who arrives at decisions (on cases) based on 'beyond reasonable doubt' principle. The CRA, after studying EIIF risks ought to arrive at a judgment, just as a judge in a court makes a conclusion beyond reasonable doubt after weighing several pieces of evidence. The risk matrix discussed in Chapter 4 provides the analyst guidance in this regard. The comfort zone lasts only as long as both financial and operating risks are medium. If one of the business or financial risks is judged as high risk, then the analyst should find strong mitigants to raise the credit to an acceptable quality.

9.3 IDENTIFYING SIGNIFICANT EIIF RISKS

While evaluating various risks at hand, the credit executive should weigh them and bifurcate them into significant and insignificant ones. While this is usually subjective, some degree of objectivity can be brought in by assessing the following:

- a. Probability (likelihood) of occurrence: It can be categorized into low, moderate and high.
- b. Consequence, if occurred: The impact can be rated weak, moderate and strong.

The analysis of various risks identified enables the credit executive to prioritize the addressing of risks and decide which risks can be kept open and which ones are to be covered or mitigated fully or partly. The likelihood and the impact of EIIF risks can be presented in a matrix form as shown in Table 9.1.

Impact/Occurance	Low	Moderate	High
Weak impact	Insignificant risk	Insignificant risk	Significant risk
Moderate impact	Insignificant risk	Significant risk	Very significant risk
Strong impact	Significant risk	Very significant risk	Extremely critical risk

Table 9.1 EIIF risks presented in a matrix form.

While the insignificant ones may be kept open, it is advisable to cover all significant risks. Strong, suitable mitigants should be identified for very significant risks. If extremely critical risks are present, it is advisable not to pursue the credit. For instance, suppose the following are some of the risks identified with respect to an established airline:

- 1. Stagnant business growth as a result of competition from other airlines.
- 2. Aggressive fleet expansion, which may lead to overcapacities.
- 3. Low safety standards resulting in crash/disastrous hijacking.

Let us decide which risks are significant ones.

- 1. Stagnant business growth is of moderate occurrence probability. The consequence, if it occurs, is also moderate. Hence it can be categorized as moderate probability/weak impact. It can be kept open with sufficient monitoring of how the airline is facing the competition, including strategies and management plans.
- 2. While fleet expansion is welcome, the risk of overcapacity looms large. The probability is moderate, considering the fact that the expansion has been undertaken after a thorough market study. However, if it results in overcapacity, the financial strain of flying near empty aircraft would be hefty. Hence, the impact is moderate and can be classified as moderate probability/strong impact. It is a very significant risk and advisable to have it covered by guarantees or suitable mitigants.
- 3. Any crash or dangerous hijacking incidents will create negative publicity and poor image, resulting in decline in revenue and similar consequences. (Note that after the 1998 crash with 202 casualties CAL of Taiwan reported its worst financial performance in four decades.) While the probability is low, the strong impact makes it imperative to seek appropriate mitigants. The creditor

should check the safety systems, average age of the aircraft and if necessary, seek the help of an external expert.

9.4 RISK MITIGANTS

Risk mitigants refer to certainties which ensure adequate financial resources or means to repay the credit despite the presence of certain significant risks. Mitigants reduce uncertainty. Many mitigants can be traced to the income, assets, wealth or strengths of the obligor, some of which can be identified by financial analysis. It should always be borne in mind that the primary source of repayment should be the cash flow of the business, and the analysis should focus on the sustainability of this. Strong mitigants can render high credit risk acceptable. As a simple example, let us suppose that the EIIF analysis shows that the credit risk involved in extending credit to XYZ Ltd is high. However, if XYZ Ltd offers a bank guarantee from a first class commercial bank, it amounts to an adequate mitigant, which converts the high credit risk into an acceptable one.

9.5 TYPES OF MITIGANTS

Basically, risk mitigants can be categorised into two: (a) Qualitative and (b) Quantitative.

Qualitative Mitigants

These mitigants derive force from the factors that provide excellence or superiority to the obligor in certain areas, which ensure adequate repayment ability by ensuring sufficient volume of business or profitability. While qualitative mitigants vary from case to case, broadly they can be classified into two:

a. Strengths/Strategies: As we have already seen, SWOT analysis is one of the important components of company analysis. While it helps to bring out the internal risks, it also highlights the strong points of the obligor. In many situations these strengths offset some of the credit risks to be undertaken by the creditor. Let us suppose that new entrants are one of the major operating risks facing an obligor, who happens to be the market leader in the segment. This

(market leadership) can be considered as a strong mitigant if the obligor has adopted policies aimed at retaining its market leadership position, without considerably eroding its profitability. Strategies that provide competitive advantages and development of core competencies are two other strong mitigants to tackle some of the credit risks of an obligor. Basically these factors can ultimately be traced back to the quality of management. Capable and honest management with a proven track record and competency goes a long way as an effective mitigant.

b. Comparative Advantages: Certain inherent advantages arising from proximity to key inputs, cheaper sources of supplies, captive markets, etc., are some of the advantages that can be treated as mitigants. Comparative advantages are of two types: (a) One that belongs to the external environment and benefits all in the industry. For instance, most of the petrochemical manufacturers in the Middle-East survive the cyclical downturns because of the proximity to the cheaper inputs, which is not the case with petrochem producers of Europe. Consequently, certain petrochemical plants in Europe were shut down in the last decade (1990s) while capacity increased in the Middle-East. Another example is India, where the software talent is the best and most competitive in the world, which attracts numerous reputed software companies into India. (b) The second type is comparative advantage that accrues to a particular firm. Bajaj Scooters has one of the largest factories in the world, which results in brute force of large economies of scale. In many situations, backward integration such as ownership of sources of raw materials provides similar advantages. For instance, while TISCO has iron ore and coal mines, MRF has rubber plantations, which provide unique comparative advantages.

Most of the qualitative mitigants depend upon the management techniques adopted by the company. Prioritizing a company's business risks is usually a matter for senior management. Ideally, the amount of management effort spent on one issue in relation to any other should be parallel to the perceived degree of risk that it poses to the business. The selection of a mitigant expects a close correlation between a creditor's perception of a given risk and the extent to which creditor feels control over that risk; the perceived risk would then be greatest for the factors over which the creditor has least control.

Let us look at some of the commonly applicable qualitative mitigants:

- *a. Deep pockets/substantial resources*: Since most of the operating risks ultimately lead to financial losses or cash haemmorhage, higher the fund raising capacity, the better. Sometimes, the reputation or strength of financial statements enable firms or groups to raise funds easily from external sources, which is a mitigant. Similarly, the quality unencumbered assets, acceptable as security to lenders can at times act as a mitigant.
- b. Alternative sources: Production/supply risks are mitigated if such interruptions can be offset by alternative sources. Ability to switch production to another factory or outsource the interrupted activity are strong mitigants. Companies that report little or no disruption in the supply chain generally have two factors in common:
 (i) Alternative channels from suppliers/to customers (ii) Excess inventory in channels or in alernative geographic locations. Such a risk management plan is a proof of sophistication. Although such contingency plans do not eliminate risk, they result in significant risk mitigation. The management ought to look at these not as an additional costs, but as profit-driven, because they save the entity from losing markets/revenue from such risks.
- *c. Size of the business*: Usually, the bigger the size, the better, as it brings in economies of scale. Secondly, given the jobs involved, the government will be interested in its survival, although of course, all this is influenced by the policy of government in power. (eg Chrysler in the 1980s.)
- *d. Core competencies*: Core competencies refer to the organizational skills that provide a competitive edge. The skills may be related to technical, marketing or finance aspects or anything that provides a firm the ability to introduce/create better products, achieve cost efficiencies, or serve the customer better, among others. Not all firms come to the marketplace with core competencies in critical areas. The missing pieces of a core competency often can be acquired through alliances and licensing agreements or by recruiting capable hands. While turning around Nissan in the early 2000s, the main strategy was to focus on their core competency—technology (leading to several sophisticated models at affordable prices).
- *e. Sustainable competitive advantages*: Business firms having sustainable competitive advantages in one form or another or which successfully develop such advantages are likely to face fewer difficulties in a business downturn. One advantage could be core competencies in certain critical areas. Another advantage can be developed externally by locating business near resources, where they are cheap and abundant. Various countries have certain specialities, which

result in some kind of competitive advantages. While China has the cheapest labour force in the world, Indian software engineers are considered the best in the world. While Japanese are the most hardworking, the Middle-East has the cheapest oil and gas reserves, which can sustain related industries, even in the worst cyclical downturns.

f. Others: Some mitigants are to be established on a case-by-case basis. A strong mitigant is the importance of the business unit to the local economy, in which case local governments come out with friendly measures to ensure its sustainability. In other instances, political connections can sometimes act as an effective mitigant. While this mitigant is long-term in certain instances such as with a royal family in a kingdom, in democratic countries, where the elected governments change, the political connection may act as a mitigant only in the medium term.

Quantitative Mitigants

Such mitigants are quantifiable, and often the creditor can estimate the level of comfort in amounts—or quantiatively. Letters of credit or guarantees provided to a manufacturer by buyers and mortgage of land and building by a borrower are some of the examples. The essential differences between qualitative and quantitative mitigants are two: (a) Qualitative mitigants rely on the repayment ability that comes within the organization while the quantitative mitigants are usually from a third party or source. (b) Secondly, the creditor can be reasonably assured about the sum or amount in quantitative mitigants.

Two of the common quantitative type of mitigants are:

a. Transfer of risks: This is usually done by insurance, where the specifications of insurance are spelt out. Insurance covers a lot of operating risks and some financial risks. Fire, marine, theft and keyman risks are some of the risks that can be insured. In cases where the credit exposure is large, usually the creditors (viz. banks) call for assignment of the insurance in their favour. Loss of profits policy covers financial risks associated with the operating risks. Another technique of transfer of risks is through the use of derivatives such as forward contracts, hedging, swaps and options. Usually foreign currency exposures, interest rate risks and commodity price risks are mitigated by the use of derivatives. However, it is to be noted that

the use of derivatives in itself is a risk, which, if not properly managed and executed, can wreak havoc on the organization.

b. Security: Tangible and intangible securities are sought by the creditor to mitigate credit risks. This can take several forms. While the usual intangible forms of securities include guarantees, letters of credit, letters of comfort and so on, the tangible securities take the form of real physical assets such as land, building, shares, etc. Securities can be taken in several different forms, with varying degrees of ease of liquidating them to cover the repayment obligations. Securities form a very strong mitigant, and both financial and non-financial institutions use this. We will cover more of this, later in a different section. (Chapters 19 and 20.)

9.6 PRINCIPLES TO BE BORNE IN MIND WHILE SELECTING MITIGANTS

- a. Integrity and excellent track record of the obligor is the best mitigant.
- b. If the credit is not able to stand alone or be justified in itself, it is often too risky to extend credit just on the basis of mitigants.
- c. Source of repayment should be embedded in the purpose of the credit, as far as possible. This includes first-degree mitigant or qualitative type of mitigant, which we have discussed earlier. For instance, when a raw material/input supplier provides goods on credit, he can be reasonably assured that the repayment will come from the sale of the inputs (sometimes after conversion) supplied. Similarly, when a financial institution provides working capital finance, the repayment ought to flow in on completion of the working capital cycle while project financing repayments ought to come from the project inflows. Procedures which enable the supplier of credit to track down and control the use of funds, are also effective mitigants.
- d. Since cash flows are sources of repayment, the mitigants should either protect the cash flows or open up another source in the event of risk occurrence. The likelihood and consequence of the risks are to be judged while considering the mitigants. Small and irrelevant risks may be kept open.
- e. Always seek a minimum of two sources of repayment. For instance, if liquidation of current assets are the source of repayment of working capital credit/loans, the net profit + depreciation component (e.g., Short-Term Debt Cover Ratio discussed in Chapter 8) can be another source. Quantitative mitigants such as letters of credit can be another source, if the borrower/debtor fails to meet commitments.

f. Although tangible security is a mitigant, it is not same as the source of repayment. Most of the securities, especially physical assets, take time to be converted into cash through legal enforcement. The only exception may be credit against fixed deposits and leasing, to a certain extent. Under leasing, the assets are owned by the lessor, and hence the legal enforcement is easier.

9.7 MONITORING OF CREDIT RISK

Many credit losses occur because of failure to monitor credit risk. Monitoring of credit risk is often considered a passive affair. Gathering of some information from the customer and processing it through some minimal ratio analysis is frequently the way monitoring is handled. Many credit executives fall into the fallacy that in today's highly competitive environment, it is difficult to canvass new business and it is unwise to displease the existing customer by enforcing strict monitoring. While it is understandable that marketing pressures can cause dilution in the rigour of credit risk monitoring, the danger of lack of proper monitoring is serious. It will negate the extra business canvassed, and the underlying credit risk may turn high. The demands that bad credit make on management time and follow-up costs can be debilitating while the probability of ultimate non-recovery of dues looms large.

Proactive management of credit risk before serious problems arise is the hallmark of credit risk monitoring. It requires understanding of the operating risks and financial risks in sufficient detail to recognize adverse developments in any of the underlying factors. The hypothesis of credit risk monitoring should be that the deterioration in economic and other business conditions are inevitably reflected in the performance of obligors. Frontline credit risk management officers ought to be alert to adverse developments—viz. early warning signs.

Some of the essentials of a proper credit risk review are given below:

 Follow religiously the 'Know Your Customer' principle. A business enterprise is a dynamic entity, changing as it acts on and reacts to the various stimuli of the operating environment, comprising external, industry and internal factors. Hence 'Know Your Customer' needs constant updating, which can be accomplished by looking at the monitoring process as if a new credit is being sanctioned.

- 2. A good understanding of the mission and goals of the obligor as well as the company culture and business practices assists in determining the focus of the monitoring.
- 3. Timely receipt and analysis of financial information. The financial analysis must transcend rudimentary or elevator (viz. just seeing increases and decreases in the ratios and figures) analysis and focus on the real causes and the future course. Given the financial and accounting irregularities in the recent times, as exemplified in the high profile instances (such as Enron, WorldCom and Tata Finance) sufficient attention should be paid and no financial number should be accepted without understanding the underlying accounting policies.
- 4. Remember that the history often repeats itself. It is especially true for business cycles and resultant economic up- and downturns, which lift and sink business enterprises in their course. Given the dynamic but volatile markets and asset prices, monitoring should focus on and ensure that the repayment sources do not become illusory and the collaterals are not unstable.
- 5. Many lists of warning signs are published and considered in the credit department of both financial and non-financial enterprises for monitoring credit risk. However, the success of this seems to be mixed as is evident from the plethora of credit losses and NPA in many countries. This observation is not meant to diminish the traditional monitoring and warning signs, but to set the process in the proper context. Credit risk monitoring based on the EIIF model can result in a comprehensive verification of credit risk by focusing on external, industry, internal and financial factors of the obligor. The resultant strengthening or decline in key elements will trigger the risk migration of the obligor to the appropriate column of the Credit Risk Matrix (Chapter 4), recognizing changes in dynamic circumstances.

9.8 CREDIT RATING

Ratings provide an easy way to understand the credit risk and are being extensively used. Credit ratings are of two types—external and internal ratings. While the former refer to the credit rating conducted by an external agency such as CRISIL, Moody, S&P and CARE at the desire of the obligor to facilitate tapping of debt capital market, the internal ratings are assigned by creditors—FI or non-FI—to appropriately reflect the credit risk involved. Internal rating systems deployed by banks, financial institutions and others vary across the board, but the ultimate goal remains the same—credit risk management.

Ratings assume more importance for banks and FIs covered by the new Basel Accord because the new approaches to measure credit risk actively advocate the use of ratings. While external ratings are given prominence in the Standardized Approach, the Internal Ratings are the core of the advanced approaches. We will see more of this in the ensuing chapters.

Reliability of External Ratings

A credit rating is an assessment by a third party of the creditworthiness of an issuer of financial securities. It tells investors the likelihood of default or non-payment by the issuer, of its financial obligations. In fact external rating agencies, wherever they exist, have a very responsible role to play in the debt capital market of an economy. In India and the US, SEBI and SEC designates only very few rating agencies with the stamp of approval. While CRISIL, CARE and ICRA are the ones approved in India, the counterparts in the US are Moodys, S&P and Fitch. Usually, companies that desire to approach the public debt market should obtain ratings from at least two agencies. Only if the rating agencies assign a minimum investment grade, can they go ahead with the debt issue. The agencies are supposed to keep in touch with the developments associated with the debt issuer and revise ratings in the event of significant credit events. The ratings by these firms are captured by alpha-numeric letters, which are often stated to the shortest editorials that could ever be written. An example of a rating system is the *Ratings Definitions* shown below:

- Highest quality ... AAA
- Very good quality ... AA
- Good quality ... A
- Medium quality ... BBB
- Lower medium quality ... BB
- Poor quality ... B
- Speculative quality ... C
- Default ... D

While AAA represents the highest quality of credit exposure (viz. low credit risk), the D represents the high credit risk. Usually certain notations like '+'or '-' or numerals such as 1,2,3 are affixed to the alphabets mentioned above to highlight the distinctions in credit risk under each grade. Please refer Appendix B for a detailed Rating Definition Chart.

However, how reliable are the external ratings? Can one skip internal ratings and rely solely on external ratings? The prudent answer is no. The collapse of Enron, which enjoyed investment grade rating just months before its bankruptcy has eroded the faith in the three big credit rating agencies in the US. However, a comforting factor is that such fiascos are rare, and the rating agencies improve their rating methodology with every such disaster. From a creditor's point of view, unless it lacks resources, it ought to put in place an internal credit rating system to evaluate the credit. This is because of the certain inherent defects in external ratings, which are explained below:

- a. Most external ratings are done in times of debt issues by the obligors and to fulfil a statutory requirement. In such cases, the ratings represent the quality of the particular debt issue. External ratings need not always rate the issuer or the company in full. Accordingly, these ratings will not be the real reflection of the issuer rating. For instance, if a debt issue enjoys sound collateral, the external rating of the debt issue would be better than that of the issuer rating. External rating is debt-issue-oriented rather than borrower-specific.
- b. SEC, SEBI and similar regulatory bodies prescribe certain minimum conditions to qualify for debt issues, which screens out almost the entire middle or medium market and smaller business segments. Ratings from external agencies exist only for large listed companies. There are no external ratings available for obligors belonging to entities not in a position to meet the eligibility criteria.
- c. Conflict of interest: The agencies earn a substantial part of their income, in some cases as high as 90%, from ratings assigned to the corporate sector and some point out this as a conflict of interest. It is not unusual to have two agencies come out with different ratings for the same obligor.

Internal Ratings

Almost all business creditors do adopt some kind of internal ratings, ranging from the crude to the highly sophisticated. The denial of credit by a retailer to a habitually defaulting customer, the decision by a wholesaler to deny credit to a new buyer, or a financial institution downgrading a borrower are all examples of internal credit rating. In businesses, where credit risk is critical, an internal rating system that provides consistent evaluation and rating facilitating coherent credit decisions across branches or divisions is essential. In banks and most FIs, the internal rating systems have been

standardized and well documented, which leads to harmonious credit rating across borrowers, which on aggregation provides meaningful information of the credit quality of the portfolio as well.

Internal rating is the result of the study of: (a) borrower (b) group, if any and (c) credit facility, the details of which are discussed below.

- a. *Borrower:* Stand-alone credit risk of the obligor, without considering the security or collateral is vital, as it brings out the intrinsic borrower-level risk. It is the beginning point of internal rating. Initially, it is essential to understand the borrower's fundamentals as we have discussed under the EIIF framework. The SWOT analysis, industry features, barriers of entry, growth potential, technology, external environment, market share, management competence etc., should be studied to understand the borrower's rating. The risk matrix discussed in Chapter 4 shows the main two levers acting on borrower-level credit risk.
- b. *Group:* If a group concern or holding company or another associate company offers support to the borrower, the borrower-level risk should be viewed as the combination of both the borrower and the supporting entity. Group support can be in several forms-such as Letter of Guarantee, Letter of Comfort (Strong & Weak) and Letter of Awareness. In such cases EIIF analysis should be applied to gauge the creditworthiness of the supporting entity/parent/group. Assuming the EIIF study proves the sound financial strength and creditworthiness of the supporting entity/parent/group, three tiers of group support can be envisaged:
 - 1. *Strong:* Supporting entity/parent/group provide unqualified and legally enforceable guarantee to meet obligations of the borrower. In such cases, the creditor may even substitute/swap the rating of the borrower with that of supporting entity/parent/group. Technically, in such cases the lending to the borrower should constitute as good as lending to the supporting entity/parent/group.
 - 2. *Moderate Strength:* Non-legally enforceable written engagements such as letters of comfort/awareness; financial covenants, etc. In the case of letter of comfort, a breach of trust suit may be brought against the supporting entity, which still lacks the legal force of a strong guarantee.
 - 3. Weak: Any support that does not belong to strong or moderately strong categories can be considered as a weak support. Verbal support or non-involvement promises and supports in the same vein can be considered as weak.

Once again, it is to be stressed that the parent and group should possess sound financial strength and creditworthiness before the support is considered as a risk mitigant.

c. *Facility:* Facility rating is basically concerned with the assurance of the source of repayment. A well-collateralized facility might have a good internal rating even if the borrower rating is unsatisfactory. Basically, the facility rating depends on the covenants, collateral and other factors that accelerate or are linked directly to recovery in the event of default—such as finance lease, where the title of the asset remains with the creditor till the last installment is paid. Similarly, even with a borrower rating of C, if fully secured by a cash deposit equivalent to credit amount, a sound internal rating can be assigned since the facility rating is very strong. Loss given Default (LGD) concept, discussed in chapter 13 & 15, is invariably linked to the facility collateralization.

Thus the overall internal rating depends on three elements: (i) EIIF study as per the risk matrix discussed in Chapter 4 (ii) Support of creditworthy parent and/or group and (iii) facility risk mitigants/ collaterals. To summarize, as a rule of thumb, if at least one of these three elements is strong in a credit, that particular credit could be classified as a satisfactory credit risk and if all the three elements are weak, it forms the worst credit risk.

9.9 5CS AND EIIF MODELS

The 5Cs model is the traditional credit analysis model. Usually the 5 'Cs' are: (a) Collateral (b) Conditions (c) Capacity (d) Capital and (e) Character. The EIIF model is more comprehensive than the traditional model. In fact EIIF is a natural growth necessary to tackle the challenges of modern-day credit risks and effective analysis. Most of the modern financial institutions have replaced the 5Cs model with better analytical models, although they need not be as advanced as the EIIF model.

While collateral is a prominent part of 5Cs, it is to be noted that most of the high quality creditworthy customers—for instance AAA rated corporates—need not extend collateral in most cases. Often, AAA companies avail credit with negligible terms and conditions. As evident, a credit analysis based on 5Cs cannot be applied in such cases effectively. As per the EIIF model, the collateral and terms and conditions are viewed as risk mitigants. Once the EIIF model is applied and if the consequent credit risk is low, both collateral and strict

conditions may not be introduced. Similarly, in non-recourse project credit or factoring, the suppliers of credit cannot insist upon any collateral at all.

The scope of Capacity, Capital and Character in the 5Cs model is narrow. For instance, the capacity measures expenses, open credit limits, current debts and other receipts and payments which provide a rule of the thumb idea to the creditor as to how much debt the borrower/debtor can handle. In-depth study of financials cash flows or Z-Score is lacking, while the impact of industry and management risks on the Capacity is ignored.

However, it is to be noted that the two models are not contradictory. While EIIF is more extensive and comprehensive in its approach to credit risk analysis, in-depth study of economic and external risks, industry and internal risk as well as financial risks is lacking in 5Cs. The EIIF approach helps the analyst to see the whole picture from the external, industry and corporate levels and facilitates effective judgment of the level of credit risk. Nonetheless, even today, some of the banks and financial institutions follow 5Cs for evaluating personal credit. In such cases, the capacity refers to the personal monthly income of the individual, while lenders evaluate the character by reviewing the existing credit relationships—credit cards, bank loans, mortgages, etc. Even in personal credit, new PC-based credit scoring techniques are replacing the traditional 5Cs.

ILLUSTRATION: CREDIT RISKS AND POSSIBLE MITIGANTS

Common credit risks and possible mitigants are given below:

A. External Risks

1. Foreign Currency (FC) changes	:	Hedging/Derivatives.
2. Eco slowdown	:	Export Markets (free from local slowdown) or counter- cyclical activities in the business portfolio.
3. Tariff structure	:	Usually, an open risk.
4. WTO changes	:	Do.
5. International trade risks	:	Letters of credit.
6. Sovereign risks	:	Letters of credit confirmed by a bank outside the subject country.
7. Civil wars/Domestic disturbances	:	Letters of credit or Insurance, as appropriate.
8. Interest rate risks	:	Interest rate derivatives/Hedges.
9. Foreign exchange risks	:	Hedge/Derivatives.
10. Cultural/Fashion changes	:	Usually, an open risk, but management expertise/skills can
Ũ		be a mitigant.
11. Outbreak of epidemics (SARS, etc.)	:	Do.
12. Corruption/Red tapism in bureaucracy, etc.	:	Do.

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B. Industry Risks

13. Buyers' concentration risk	:	Strong, long, satisfactory and time-tested track-record of relationship with buyers is a good mitigant. Most of the parts suppliers to automobile manufacturers survive despite strong bargaining power of the buyers. More mitigants can be found out by refering back to the chapter on Industry Analysis.
14. Suppliers' concentration risk	:	Do.
15. Intensity of competition	:	Normally open, especially in the case of perfect competition.

Other situations such as monopolistic/oligopolisitc competitive situations can be tackled by adequate strategies. Many of the usual strategies have been discussed in Chapter 7.

16.	Raw material/key input prices	:	Hedging/derivatives, if available. Or ability to pass on the increased costs to the buyers. Or proven expertise built over time, reducing input consumption.
17.	Dumping issue	:	Open and impacts the industry. Ability to take it up with the govt. authorities.
18.	Life-cycle	:	High risk towards the end of the cycle.
19.	Risk of new entrants	:	Barriers of entry.
20.	Surplus capacity	:	Usually, an open risk. Export markets can be a mitigant.
21.	Emergence of substitute	:	do Start dealing in/producing substitutes.

C. Internal (Company-Level) Risks

At company level, decisions, policies and strategies are to be made to tackle the issues originating from the external environment and industry. In fact, as we have seen in Chapter 8 that internal risks are critical because they decide how the business meets the challenges from the environment and exploits opportunities and the development of core competencies and strategic advantages, ensuring survival and long-term profitability.

Some of the company-level risks and mitigants are:

22.	Inadequate strategies to external/industry risks	8:	Normally an open risk but rectifiable. The examples are lack of FC hedges, lack of long-term reliable suppliers, etc.
23.	Poor management skills	:	A covenant may be introduced to appoint qualified personnel to the satisfaction of the creditors.
24.	Internal controls	:	External audit or change to a reputed auditor.
25.	Sibling rivlary	:	Usually, an open risk. Can try to mediate.
26.	Big projects	:	Usually, an open risk. Ought to ensure that the obligor has the capacity to withstand if the projects go wrong.
27.	Overdiversification	:	Usually, an open risk. Ensure that the management has or has brought in necessary skills/experience to effectively deal with the issues of the new areas. If not, quit or ask for strong quantitative mitigants.
28.	Non-core activities	:	Do.
29.	Product risks	:	Insurance cover on product liabilities (chemicals, pesticides, etc).

30. Bad debts (liberal credit)	:	Open, ask them to amend the credit policy, if not too late.
31 Lack of transparency		Adequate strong quantitative mitigants
32 Boycotting of products or otherwise	:	Usually, an open risk
33 Local people's objection	:	Usually, an open risk
34. Technological problems	:	Usually, an open risk, technology warranties from providers
35. Loss of agoney	•	Usually, an open risk, some of the mitigants are other
35. Eoss of agency	•	agencies, non-agency business, etc.
36. Disputes with govt./tax dept/ customers/suppliers	:	Legal opinion.
37. Concentration risk (of revenue, product, customers, suppliers, etc)	:	Long and time-tested track record.
38. Slow-moving items	:	Usually, an open risk. Ask them to improve stock management. Obtain commitments
39 Employee frauds		Insurance
40 Forward/backward integration	:	Open diversified husiness/product portfolio
41 Expiry of contracts		Open, nossibility of renewal
42 Key man risks	:	Insurance cover
43. Fire risks		Do.
44. Dwindling of capacity in relation		Look at the business strategies.
to the industry		
45. Loss-making divisions/subsidiaries	:	Doensure turnaround strategies.
46. Size	:	If size is too low, cannot compete effectively.
47. Lack of focus of vital functions such	:	Open, covenant for recruitment.
as finance/mktg		1 ,
48. Key shareholder busy with other projects	:	Usually, an open risk, raise a concern.
49. Project delays/cost overruns	:	Usually, an open risk, ensure project management capabilities beforehand.
D. Financial Risks		
D. Financial Risks50. Liquidity crunch	:	Strong finance function & sound financial position of
D. Financial Risks50. Liquidity crunch	:	Strong finance function & sound financial position of shareholders, ability to raise funds on short notice from related parties or otherwise.
 D. Financial Risks 50. Liquidity crunch 51. High gearing/leverage 	:	Strong finance function & sound financial position of shareholders, ability to raise funds on short notice from related parties or otherwise. Usually, an open risk. Some of the mitigants are low
D. Financial Risks50. Liquidity crunch51. High gearing/leverage	:	Strong finance function & sound financial position of shareholders, ability to raise funds on short notice from related parties or otherwise. Usually, an open risk. Some of the mitigants are low operating leverage, market leadership position, growth
D. Financial Risks50. Liquidity crunch51. High gearing/leverage	:	Strong finance function & sound financial position of shareholders, ability to raise funds on short notice from related parties or otherwise. Usually, an open risk. Some of the mitigants are low operating leverage, market leadership position, growth company, sound shareholders. Better to include some kind
 D. Financial Risks 50. Liquidity crunch 51. High gearing/leverage 	:	Strong finance function & sound financial position of shareholders, ability to raise funds on short notice from related parties or otherwise. Usually, an open risk. Some of the mitigants are low operating leverage, market leadership position, growth company, sound shareholders. Better to include some kind of quantitative mitigants as well.
 D. Financial Risks 50. Liquidity crunch 51. High gearing/leverage 52. High total leverage 	:	Strong finance function & sound financial position of shareholders, ability to raise funds on short notice from related parties or otherwise. Usually, an open risk. Some of the mitigants are low operating leverage, market leadership position, growth company, sound shareholders. Better to include some kind of quantitative mitigants as well. Financial covenants, to bring down leverage. Monopoly
 D. Financial Risks 50. Liquidity crunch 51. High gearing/leverage 52. High total leverage 	:	Strong finance function & sound financial position of shareholders, ability to raise funds on short notice from related parties or otherwise. Usually, an open risk. Some of the mitigants are low operating leverage, market leadership position, growth company, sound shareholders. Better to include some kind of quantitative mitigants as well. Financial covenants, to bring down leverage. Monopoly advantages/rapidly growing market, etc can also be strong
 D. Financial Risks 50. Liquidity crunch 51. High gearing/leverage 52. High total leverage 	:	Strong finance function & sound financial position of shareholders, ability to raise funds on short notice from related parties or otherwise. Usually, an open risk. Some of the mitigants are low operating leverage, market leadership position, growth company, sound shareholders. Better to include some kind of quantitative mitigants as well. Financial covenants, to bring down leverage. Monopoly advantages/rapidly growing market, etc can also be strong mitigants.
 D. Financial Risks 50. Liquidity crunch 51. High gearing/leverage 52. High total leverage 53. Cash downstreaming/upstreaming 	:	Strong finance function & sound financial position of shareholders, ability to raise funds on short notice from related parties or otherwise. Usually, an open risk. Some of the mitigants are low operating leverage, market leadership position, growth company, sound shareholders. Better to include some kind of quantitative mitigants as well. Financial covenants, to bring down leverage. Monopoly advantages/rapidly growing market, etc can also be strong mitigants. Financial covenants.
 D. Financial Risks 50. Liquidity crunch 51. High gearing/leverage 52. High total leverage 53. Cash downstreaming/upstreaming 54. Big projects 	:	Strong finance function & sound financial position of shareholders, ability to raise funds on short notice from related parties or otherwise. Usually, an open risk. Some of the mitigants are low operating leverage, market leadership position, growth company, sound shareholders. Better to include some kind of quantitative mitigants as well. Financial covenants, to bring down leverage. Monopoly advantages/rapidly growing market, etc can also be strong mitigants. Financial covenants. Financial covenants. Financial covenants (restricting new CAPEX).
 D. Financial Risks 50. Liquidity crunch 51. High gearing/leverage 52. High total leverage 53. Cash downstreaming/upstreaming 54. Big projects 55. Poor collections 	:	Strong finance function & sound financial position of shareholders, ability to raise funds on short notice from related parties or otherwise. Usually, an open risk. Some of the mitigants are low operating leverage, market leadership position, growth company, sound shareholders. Better to include some kind of quantitative mitigants as well. Financial covenants, to bring down leverage. Monopoly advantages/rapidly growing market, etc can also be strong mitigants. Financial covenants. Financial covenants. Financial covenants (restricting new CAPEX). DoAlso see above (Colevel risks).
 D. Financial Risks 50. Liquidity crunch 51. High gearing/leverage 52. High total leverage 53. Cash downstreaming/upstreaming 54. Big projects 55. Poor collections 56. Huge dividends 	:	Strong finance function & sound financial position of shareholders, ability to raise funds on short notice from related parties or otherwise. Usually, an open risk. Some of the mitigants are low operating leverage, market leadership position, growth company, sound shareholders. Better to include some kind of quantitative mitigants as well. Financial covenants, to bring down leverage. Monopoly advantages/rapidly growing market, etc can also be strong mitigants. Financial covenants. Financial covenants (restricting new CAPEX). DoAlso see above (Colevel risks). Do.
 D. Financial Risks 50. Liquidity crunch 51. High gearing/leverage 52. High total leverage 53. Cash downstreaming/upstreaming 54. Big projects 55. Poor collections 56. Huge dividends 57. Diversion of funds 	:	 Strong finance function & sound financial position of shareholders, ability to raise funds on short notice from related parties or otherwise. Usually, an open risk. Some of the mitigants are low operating leverage, market leadership position, growth company, sound shareholders. Better to include some kind of quantitative mitigants as well. Financial covenants, to bring down leverage. Monopoly advantages/rapidly growing market, etc can also be strong mitigants. Financial covenants. Financial covenants (restricting new CAPEX). DoAlso see above (Colevel risks). Do.
 D. Financial Risks 50. Liquidity crunch 51. High gearing/leverage 52. High total leverage 53. Cash downstreaming/upstreaming 54. Big projects 55. Poor collections 56. Huge dividends 57. Diversion of funds 58. Poor stock management 	:	Strong finance function & sound financial position of shareholders, ability to raise funds on short notice from related parties or otherwise. Usually, an open risk. Some of the mitigants are low operating leverage, market leadership position, growth company, sound shareholders. Better to include some kind of quantitative mitigants as well. Financial covenants, to bring down leverage. Monopoly advantages/rapidly growing market, etc can also be strong mitigants. Financial covenants. Financial covenants (restricting new CAPEX). DoAlso see above (Colevel risks). Do. Do. Do.
 D. Financial Risks 50. Liquidity crunch 51. High gearing/leverage 52. High total leverage 53. Cash downstreaming/upstreaming 54. Big projects 55. Poor collections 56. Huge dividends 57. Diversion of funds 58. Poor stock management 59. Unstable profitability/cash flows 	: : : : : : : : : : : : : : : : : : : :	Strong finance function & sound financial position of shareholders, ability to raise funds on short notice from related parties or otherwise. Usually, an open risk. Some of the mitigants are low operating leverage, market leadership position, growth company, sound shareholders. Better to include some kind of quantitative mitigants as well. Financial covenants, to bring down leverage. Monopoly advantages/rapidly growing market, etc can also be strong mitigants. Financial covenants. Financial covenants (restricting new CAPEX). DoAlso see above (Colevel risks). Do. Do. Do/periodical stock inspection (or audit by external agencies). Diverisified business portfolio/quantitative mitigants.

These lists are only for illustration and not all inclusive.

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PART THREE

Credit Risks— Project and Working Capital



Credit Risks in Project Finance

Successful projects by both government and private sector usually determine the well-being of nations. 'Project' has opportunities written all over it. It brings the resources of a country into productive use, creates employment, adds new products and output to the economy and a general pick-up in demand ensues, which in economic parlance, creates a Multiplier Effect. But first of all, a project needs capital to begin with. 'Project finance' is a term used to describe the financing of any capital investment that involves a longish time horizon with long-run benefits. A significant part of the project finance is arranged through credit.

Usually projects are funded through a mix of debt and equity because it is nearly impossible for project promoters to raise sufficient equity. The tax advantage of debt is another luring factor. Also, a range of suppliers of project finance exist—from regional banks, suppliers of plant and machinery to international financing institutions who are willing to fund both government and private sector projects which are viable.

10.1 DISTINCTIVE FEATURES OF PROJECT FINANCE

Project finance is different from other types of financing. It is this distinction that makes project financing riskier, requiring specialist knowledge. Following are the three major distinctive features of project finance:

1. The source of repayment is from future internal cash generation. In contrast, working capital finance/asset finance and similar financing arrangements rely on the liquidation/inflows of the respective assets to repay the credit involved. Hence, it is possible to ensure repayment even in the absence of adequate

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internal cash generation. Asset-based financing relies on the value of the physical asset financed. This is clear from the vehicle financing schemes offered by different types of financial intermediaries. But project finance does not emphasise on the value of the physical assets financed. For instance, the realizable value of a petrochemical plant is likely to be less than the cost of building it. However, the future cash inflows (or economic benefits) will be greater than the related costs.

- 2. Project finance often relates to a new business venture. It does not have a track record to be extrapolated into the future. Creditors are at a big disadvantage at this point because—while an existing concern can be assessed for its management capability and industry position from the historical data, a new project is entirely a new affair even if it is started by experienced promoters.
- 3. Technical evaluation of the project is a key element. Hence most project finance lenders (SIDBI, IDBI, etc.) have their own technical department or outsource the technical evaluation. However, with asset-based financing, either technical performance is not relevant or is already a foregone conclusion. No extensive study is necessary as the asset is already in good working condition. For instance, aircraft financing or leasing of assets presupposes proper working of the asset. If the aircraft fails to make money, the fault will be with the strategy/practical situation rather than technical difficulties.

10.2 TYPES OF PROJECT FINANCE

Project financing is mainly of two types: (a) Non-recourse and (b) Limited recourse. In the case of the former, the lender should obtain repayment of the principal and servicing of the debt solely from the project itself, without any other kind of external support. This type of financing is attempted only when the lender has utmost confidence in the project that is financed. Limited recourse project finance refers to cases where the lenders retain some form of support or recourse to the promoters of the project. The nature of the recourse is clearly established at the outset itself, through documentation. While generally lenders prefer the second type of financing, in the case of good projects, the competitors in the market ought to be ready to offer non-recourse project finance.

10.3 WHY PROJECT FINANCE IS POPULAR

Project finance is a popular concept and is widely used to finance several government and private sector projects such as construction of pipelines, power plants, roads,

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railways, factories and manufacturing plants. Project finance techniques can also be applied to ship, aircraft and property finance. Following are the three main reasons for the popularity of project financing:

1. Scarce Resources

Project promoters often lack enough capital to put the whole venture together. Capital is a scarce commodity in many countries. Project financing brings project promoters and financiers together, sometimes even cutting across borders. It enables the entities and parties with enough funds to put them to effective use through a worthwhile cause.

2. Risk Sharing

The sheer size of projects involves considerable risks, which prompt the promoters to share them with several project lenders. (Incidentally, failure of big projects funded by a single sponsor can bankrupt the sponsor.) Even in rare cases where the project creditor/lender is confident about the project, it is still preferable to share the risk by inviting other financers into the boat. The project financier or lender should attempt to shift the burden (or risk) to the other parties involved in the project by seeking guarantees or undertakings. The end result should be such that the risks are shared among all parties concerned so that all will strive towards successful accomplishment of the project.

3. Extended Tenure

The project repayment tenure exceeds the normal schedule and can be as high as ten years or more in certain cases. For instance in 2001, Kuwait's Equate Petrochemical Company financed its expansion by way of project finance of a 10-year term loan of \$ 400M from a Syndication of Banks.

10.4 PARTIES INVOLVED IN PROJECT FINANCE

Sponsors

Project sponsors are those who undertake the project and carry out much of the responsibility to ensure its success. Project management, project scheduling and co-ordination are in their hands. Generally, they tend to be the main beneficiaries as well. The sponsor can be the government or a government entity or an individual or a

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group of individuals coming together for a common purpose. For example, the Nedumbassery Airport at Cochin was undertaken by a group of non-resident Keralites with the support of the Kerala government and partly financed by leading project lenders in India including HUDCO. Most business-level projects are smaller in magnitude, with beneficiaries contributing a significant share of the cost of the project.

Project Lenders

Since projects are generally massive in size, multiple lenders are a common feature because it brings in the advantage of risk sharing. Usually such project finance is provided through a syndication or a consortium of lenders, who come together and share the risk on a *pari-passu* basis. Project finance has become a specialized area for most lenders and they have project finance departments employing specialists in this field. Such departments usually have non-finance experts such as engineers and other professionals.

One of the main lenders acts as the financial advisor and undertakes preparation of the Credit Memorandum, which includes project credit analysis. As the **Financial Advisor**, the lead institution usually offers its expertise in apportioning risks and finding out what financing sources and techniques are available in the market. Normally, most sponsor companies have highly sophisticated finance departments, but they still rely on advisors who are constantly in touch with the market. Commercial banks, merchant banks, term lending institutions and similar financial institutions act as the lead arranger in putting the project finance together. **Arranger** is the institution that is involved in negotiating terms and documentation and syndicates the facilities among the interested participants. Another role is that of the Agent. The **Agent** is the one who is responsible for post-sanction duties such as coordinating drawn downs¹ and handling communication with all parties involved in the transaction, and often holds the security. Normally the roles of Financial Advisor, Arranger and Agent are handled by the same financial institution because of the obvious synergy advantages, although these roles

¹ Draw down is a term usually used in the context of Project Finance/Term Loans. It is a pure technical term, which reflects the amounts disbursed by the project financiers. Normally, no project financier would disburse the entire sanctioned credit limit in single shot. They would see the progress attained, the moneys put in by the promoters, etc., before the credit is released. So, naturally the project credit is disbursed in instalments. Each such instalment is known as 'draw down'.

may be allocated to different members of the syndication, especially if a syndication member has specialization in any of the areas.

Technical Consultants/Lawyers/Accountants

Usually projects are not only massive in size but complicated as well, and tend to have varied technologies, sometimes new. Independent consultants are approached to clear the technical feasibility. They are also included during the implementation stage and retained for technical assistance even after the projects go on stream.

Lawyers and accountants are the other two indispensable part of any project. Lawyers advise on the legal formalities to be completed to comply with the rules of the region and draft agreements to give effect to the understandings arrived at by different parties involved in the project. Accountants provide not only tax advice and tax planning techniques but conduct feasibility study, transaction design and financial modelling, develop hedging strategies and optimal financing strategies, among others.

Governments

While the government's co-operation and willingness to provide an investment-friendly climate is essential for any project, infrastructure projects such as roads, railways, hospitals and airports are of direct interest to any government.

Multi-lateral Agencies

Sometimes agencies across the globe may participate in project finance arrangements, especially for mega projects. Many multi-national agencies exist to promote investment and economic development on a global basis. They extend finance to big projects in the world, provided they satisfy certain socio-economic-political criteria. The principal multi-national agencies are:

- Asian Development Bank
- African Development Bank
- Commonwealth Development Bank
- International Bank for Reconstruction & Development
- International Finance Organization

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10.5 PHASES OF PROJECT CREDIT RISKS

Unlike other financing patterns—such as working capital financing, lease financing, mortgage financing, etc—project financing is complex and poses a considerable challenge for any lending banker. Just consider for a moment some of the risks associated with a big project—say an oil refinery project—in your country. What will the price of crude oil be in three years'—the time necessary to complete the project? Where can it be located? Does the location offer convenient transportation? How will the crude oil be transported? Is it through pipelines? What about terrorism? Who are sponsors of the project? What about their track record? Has there been any track record of political instability in the country? What about labour and civil unrests?

Proper dissection and awareness of the risks involved with each project are necessary to help a lender to understand the project better. These lead to exploration of risk mitigants and matching of risks and benefits to arrive at a learned conclusion about acceptability of the credit risk involved in the project.

Basically, there are three phases of project credit risk:

Construction Phase Risks

This is a very critical period for any project as it is the stage at which project financers release funds to finance materials, equipment and related costs. Since no cash inflows are generated at this stage, no interest payments are possible unless these are done out of the project outlay itself, which is very rare. Engineering, installation and test run are some of the major elements of this stage. The length of the construction phase varies from months to several years, depending upon the complexity of the project. The lenders are exposed as funds are drawn down but there is yet no certainty about the project succeeding, which is essential for future repayments.

Start-up Phase Risks

Once construction is through and the necessary technology has been acquired, tests are to be carried out to check whether the machinery and all components are working at desired parameters such as temperature and pressure, and producing results well within the anticipated range. If not, adjustments and technical corrections have to be performed. The start-up phase, which may last several months, ends with one or more trial runs. Several risks are involved at this stage. The test-runs may not produce the desired level of output, and frequent breakdowns and other technical hitches can delay the commencement of the project. Delays can be costly as the mounting interest burdens can lead even to a liquidity crisis and search for additional financing.

Operational Phase Risks

Having completed successful trial runs, the project goes on stream, and starts generating revenue in line with the original appraisals. Now the risk is more to do with business and just like any other financing, the revenue streams are expected to find enough surpluses to settle the dues on time. Awareness of the principles discussed earlier will enable the project financiers to understand the level of risks that they accept. Project financing is tricky, and often commercial banks with experience only in short-term credit plunge into project finance, only to suffer hefty credit losses.

An ideal project finance should be structured in such a way that all sponsors share the risk. The construction phase can be the riskiest part in certain projects such as hydropower. It is not unusual to abandon certain projects at the construction stage due to engineering or topographical reasons. In chemical and other complex metallurgical companies, the start-up phase is more challenging as the machinery built in cold areas of the world may encounter constant break-downs while functioning in hotter areas. Similarly, in a highly competitive industry with global capacity nearing optimum levels, the Operational Phase would pose substantial risks for new start-ups—unless they have specific competitive advantages.

10.6 PROJECT CREDIT RISKS

A project lender looks into the internal cash generation of the project and studies it to find out whether the cash flow forecasts are justifiable, before partaking in it. The external environment, industry factors within which the entity is supposed to operate and the internal affairs of the new venture require analysis, which can be effectively done through the EIIF model along with project-specific credit risks. Let us discuss the different levels of project credit risks depicted in Fig. 10.1.

EIIF Risks

External Environment: The factors discussed in Chapter 5 are relevant here. Economy management, tariff restrictions, taxes, import/export controls, foreign currency restrictions,

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Fig. 10.1 Different levels of project credit risks.

stability of the government, political unrest, corruption level, repatriation of profits and similar items affecting the transfer of benefits abroad, can be broadly categorized under this category. Political and sovereign risks are more valid for projects with international participants. Different political ideologies, sanctions and permissions by different governmental authorities involve risks, which can derail any project. In government-guaranteed projects, financiers should assess the government's ability to pay as well. *Force majeure,* which refers to events outside the control of participants impacting the success of the project are of two types—Acts of Man such as strikes, riots, wars and embargos and Acts of God or Nature, such as floods, earthquakes, droughts and tornados.

Industry Factors: Most of the factors discussed in Chapter 6 are to be applied here. Market risk occurs, for example, when the sales price falls below the assumptions. The questions to be considered are: Can the new entity attain the projected market share? How will the existing players, if any, retaliate? Long-term off-take agreements, which are considered to be the best antidote for market risk, should be carefully examined along with the nature of the business of the buyer, to ensure absence of any conflict of interest. Escalation clause in sales contracts, wherever possible, is an effective tool to cover the input cost risks. Similarly, long-term contracts with selected suppliers at

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optimal prices are among the best ways to ensure uninterrupted supply of key inputs. Risks to selling price and sales volume are to be covered by a market study.

Entity Factors: All factors, which we have discussed in Chapter 7 may not be applicable in the case of a greenfield project. Nonetheless, the CRA should attempt to apply the core analytical tools such as SWOT and strategy analysis to the project at hand.

Financials: A project cannot be studied without the study of associated financial impact of various activities planned. A thorough understanding of the fundamentals discussed in Chapter 8 is vital for a proper study of the financial factors linked to a project. However, given the distinctiveness of a project, which renders it riskier compared to other types of finance, a project creditors/lenders' financial analysis requires a broader treatment. Here, the financial projections are vital, a proper study of which presupposes strong conceptual understanding of the factors covered in Chapter 8. Analysis of financial projections, as part of unearthing project credit risk, is taken up later in this section.

Project-specific Risks

While firm-level risks which we have considered in Chapter 7 must be analysed, project-related firm risks go beyond, necessitating an enquiry into the following 10 aspects:

- 1. Technical Risks: The nature of the technology used and the frequency of its updation are to be carefully evaluated and implemented. The financers should take care to ensure that the technical life of the project is more than the repayment period. It is ideal to have a ratio of 2:1 between the technology life-span and the funding life. This is the main reason why most project financers maintain their own technical departments or outsource technical feasibility study. It is always better to ensure some sort of technology guarantees and insurance. If a novel technology is incorporated into a new project, most financiers may call for a warranty. Project financing is rarely applied to new technology (Venture capital usually takes care of unproven/new technology ventures). The financiers examine the technical feasibility study, back-up reports and assumptions. Project financers may require sponsors or technology providers to guarantee that the technology will work for a period mutually agreed upon.
- 2. *Project Delay Risk*: The risk of delay in project implementation remains, with far-reaching consequences. Such delays can result in cost overruns, and if

debt capital has been drawn down, it implies unproductive expenses creeping into the project. Cost overrun usually has a negative or inverse relationship with the debt repayment capacity. Careful planning, tight project monitoring, use of advanced project management tools, experienced project managers, etc., will reduce the risks of project cost/time overruns.

- 3. Project Management Risks: The quality of the management has to be ensured, and it is appropriate for the financers to insist upon concurrence while selecting key personnel. Financers also should pay enough attention to the medium/junior-level management and other employees to ensure that they are in line with the industry standards. Deviations are to be explained. However minutely studied, management risks still remain, compared to the financing of an on-going business, where the past performance can be the indicator.
- 4. Sponsor Risks: Wherever two or more sponsors are involved, the relationship and harmony among them, extent of financial support, and conflict of interest with their current business are among the key issues to be examined. Financers should consider whether all sponsors have enough stakes to keep them interested. In case the project failure does not impact any of the sponsors in any material manner, it poses a significant challenge to the project financer. It is advisable in such cases for financers to take a similar insignificant share of the debt funding as well. The sponsors' audited financials and credit ratings, if available, are to be studied.
- *5. Participant Risks*: Usually projects involve several participants apart from banks and other financers. JV agreements with foreign companies/local parties and with turnkey contractors and similar key participants are vital documents. The ability of all participants to fulfil their obligations and promises should be ensured.
- 6. Completion Risk: This risk falls within the first two risk areas discussed above and is closely linked to the project time/cost overrun risk. Sufficient prognosis is to be conducted to identify any likely disputes or conflicts before hand. Performance guarantees from contractors is one of the best ways to mitigate this risk. Besides, the agreements should have provision for liquidated damages in case of negligence or deliberate sabotage of the project. It is not uncommon in the business arena for participants to sabotage a project to serve certain vested interests.

- 7. Engineering Risks: This is linked more to the design and layout, and should be viewed differently from completion risk. Factory designs go a long way in reducing unnecessary movement of men and materials, which will bring in cost competitiveness. Guarantees and warranties from equipment suppliers should be obtained, as should agreements for the supply of spare parts.
- 8. Infrastructure Risks: Lack of adequate infrastructure is a big risk for any new project. Many good projects have been shelved just because of the inadequate infrastructure in the region. For instance, lack of good port facilities has been highlighted as one of the main handicaps for foreign business wishing to establish manufacturing bases in India. Road conditions, utility supplies such as water, power and similar basic facilities are to be ensured. While this may also be considered an external risk, we may prefer to treat it as an entity-level risk, assuming the project sponsors can choose a better location.
- *9. Legal Risks*: Project-related legal risks involve loopholes in agreements and documentation whereby the parties concerned can escape without fulfilling their responsibilities. While a transparent and prudent judicial framework is essential, wherever legal risks are anticipated a learned legal opinion is to be sought.
- *10. Syndication Risks*: Among the debt participants, if one pulls out or if either the financial advisor or agent mis-conducts, the ensuing loss is to be borne by all in the syndicate. Hence the credit rating and other factors of the participants in the project should be evaluated to ensure absence of any significant syndication risks.

Project Financial Viability Risks

Understanding of the financial risks is critical because, as we have seen earlier, a project financier looks primarily at the project inflows rather than the asset, for repayments. Hence, the future financial performance and the possible impact of each of the external/industry/entity risk factors are to be studied in detail. Project financial risk is unique because all project risks do have a financial angle which have a bearing on every phase of the project. For instance, project cost overruns and delays have a financial impact as does the re-modifying of processes due to technical problems. However, there are certain pure financial risks that are built into every project because of the capital structure and cost composition. Seven general aspects of such financial risks are given below:

- 1. Capital Mix Risks: An ideal mix of debt and equity differs depending upon the project at hand. Improper capital structure will reduce the flexibility to evolve along with the dynamic environment and impact either profitability or solvency or both. With other things remaining the same, a project with high operating leverage or in a cyclical industry should opt for low financial leverage. Similarly, high debt content in the capital structure usually implies greater financial risks. Usually a debt-to-equity ratio of 2:1 is considered the threshold, although capital-intensive projects with stable demand can have the ratio increased up to 3:1 or 4:1.
- 2. Debt Service Risks: A project is expected to generate enough cash flows to repay both interest costs and the principal component from its normal operations. Unless this risk is at acceptable levels, no project financier will come forward. Usually debt service coverage of 1.5X or 2X is considered as the lower cut-off limit by project lenders. A host of financial ratios are used to measure the risks involved in the project's debt service capability, which will be discussed later in the 'Financial Evaluation' section. Sensitivity analysis also goes a long way in grasping the extent of this risk.
- 3. Liquidity Risks: Many projects face tough times during the initial years after commencement of operations despite stable market conditions and optimum factory production. This is because of liquidity problems, which ultimately lead to rescheduling of loans and associated issues. Liquidity crisis can occur due to several factors such as inadequate working capital envisaged at the time of planning of the project, using short-term sources to fund long-term requirements, project cost/time overruns and initial losses. While projected liquidity ratios provide an indication of the would-be liquidity situation, key liquidity factors should be identified and subjected to vigorous sensitivity analysis. Project financing experience goes a long way to discern the probable liquidity crisis that lies ahead.
- 4. Cost of Capital (CoC) Risks: A project is feasible only if the RoI exceeds the CoC. Given the dynamic nature of the financial system/economic environment, the underlying financing costs of equity and debt change over the period of time. If CoC increases and overtakes anticipated RoI during the implementation stage, a deadlock can be anticipated. The risk can be mitigated by ensuring sufficient margin of safety between RoI and CoC and covering interest rates through derivatives.
- 5. Break-Even Point Risks: In projects with high BEP, substantial capacity utilization is required to ensure viability. Given the fact that the capacity

utilization is linked to market factors, high BEP is a risk in itself unless mitigants exist. For instance, large capital-intensive projects such as refineries and petrochemical complexes operate successfully despite having relatively high BEP. However, it is always better to optimize fixed costs so that the BEP can be held as low as possible.

- 6. Foreign Exchange Risks: We have already seen that foreign exchange controls by governments constitute a political risk. Another risk is the fluctuations in forex rates if substantial capital, equipment or inputs are imported or output is exported. While forex derivatives offer risk cover, permanent devaluation appreciations, if likely, remains an open risk.
- 7. Cost Overruns: An increase in project expenditure without corresponding increase in the production level will impact the project. How project cost overruns are financed is critical. It is always better to finance them through equity rather by debt, as the fixed commitments will increase and will have to be met from the originally forecasted output level. One technique for project sponsors to hide the real cost overrun is to present a revised project plan enhancing the output level and seeking additional financing for the enhanced level.

A proper financial study/evaluation of the project will bring out its financial viability, which is discussed in the next main topic.

10.7 FINANCIAL STUDY

A critical analysis of cash flows, debt service ability, sensitivity to movements in the price of raw materials, utility costs finished products and other key inputs are critical to any project. This is accomplished through financial study of the project. Financial appraisal of any project finance has three main stages—cash flow forecasts, estimation of the economic worth of the project and assessing the creditworthiness of the project.

Cash Flow Forecasts

Cash flows are critical and hence in the financial analysis of projects, utmost care should be taken while forecasting the project cash flows. Accounting profit, although important, does not pay dividends and meet repayment obligations, but cash does—and hence the importance. Moreover, accounting profits are influenced by the accounting policy decisions while cash flows are relatively free from accounting policies

chosen. Some of the important points to be considered while forecasting cash flows are given below:

- 1. Ignore sunk costs. Decisions should be made on future cash flows, and the expenses already incurred or investments already done should be ignored.
- 2. Include all incidental items. A project may be influenced by many factors, and the cost or benefit from all sources should be considered. For instance, while installing ATMs, the bank does not get any direct cash inflows, but the ATMs will help to attract more customers who will open new accounts with the bank and reduce transactions across bank counters.
- 3. Do not forget working capital requirements. Increases and decreases in the working capital components affect the cash flows and must be included.
- 4. Include opportunity costs. For example, while the project may be utilizing a vacant land and factory building for the new factory, the project should be charged with the opportunity costs, say, had the land and building been leased out to others.
- 5. Ignore allocated overheads to the project but factor in any additional overheads due to the project. For instance, if a part of the Managing Director's salary is allocated to the new project, it need not be charged to the project, but the new project manager's salary should be.
- 6. Source of working capital. A portion of the working capital should always be from the long-term sources. Relying entirely on suppliers and short-term bank finance has put many a viable project in trouble.
- 7. Factor in routine CAPEX into the cash outflows of the future projections. This will reduce the cash available for debt repayment and provide a more realistic or conservative picture of the cash available.
- 8. Cost of capital ought to be weighted and should be post-tax. Similarly, the calculations of relevant cash flows, available for project financiers should be also post tax.
- 9. Remember that project cash flows can be prepared for analytical purposes using varying methods just as ROA, ROCE and ROE are used in financial analysis. Just as ROA, ROCE and ROE measure returns from total assets, capital employed (total assets less current liabilities) and equity standpoint, project cash flows can be prepared from total funds (or assets), long-term funds and equity point of view. Relevant cash flows for appraisal purposes are given in Table 10.1.

Details	Project Outflows	Project Inflows
a) Total Funds	Fixed Assets	Net Profit (after Tax)
	Current Assets	Depreciation & Amortization
	Contingencies & Others	Interest (Long-Term &
		Short-Term)
		Add/Less: W/C Flows*
b) Long-term Funds	Fixed Assets	Net Profit (after Tax)
	Net Current Assets	Depreciation & Amortization
	Contingencies & Others	Interest (LT)
		Add/Less: W/C Flows*
c) Equity	Fixed Assets	Net Profit (after Tax)
	Net Current Assets	Depreciation & Amortization
	Contingencies& Others	Add/Less: W/C Flows*
	to the extent funded by Equity	
* Not so long ago, while doing the pro arriving at cash flows available to pro to net off working capital movements	oject financial viability studies, the impact of w oject financiers/sponsors. However, now it is gen since it usually consumes lot of cash and many	orking capital changes were ignored while nerally accepted that it is a prudent measure alahal financial institutions follow this

method. If routine CAPEX is significant, it is advisable to study the project financial viability based on FCF (CFO-W/C

 Table 10.1 Relevant cash flows under different points of view.

Estimation of Economic Worth of Project

The economic worth of a project can be assessed by comparing the project outflows with the project inflows. Payback Period, Accounting Rate of Return, Net Present Value and Internal Rate of Return are the major techniques used to study the relation between the cash inflows and outflows of a project and appraise its economic worth. A simple example is used below to enumerate the concepts related to the economic worth of a project, and explain the financial appraisal techniques.

Example 10. 1

Changes-CAPEX) as well.

Suppose a project, which costs 40M to build, will generate 8M cash flows for seven years and thereafter during at the terminal year, the cash generation, including the liquidation of all assets would be 12M. The cash flow estimates is given below:

Year	20X0	20X1	20X2	20X3	20X4	20X5	20X6	20X7	20X8
Cash Flow	-40	8	8	8	8	8	8	8	12

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1. Non-discounting Methods: Two methods of evaluation for estimating the worth of the project that do not take into consideration the time value of the money invested are Payback Period and Accounting Rate of Return.

- **Payback Period:** This is the time required to recoup the original investment. In our example, the payback period is 5 years. The original investment of 40M will be recovered in 5 years (5 × 8M).
- Accounting Rate of Return: This is the average rate of return during the project life. It is calculated as follows:

= Average Annual Cash Inflows \times 100 / (Total Cash Outflow)

The ARR in our example is 21.25% viz. $\{[(7 \times 8) + 12] / 8\} / 40$

Both these methods have a serious drawback as they ignore the time value of money. ARR would not be affected if all the cash inflows were postponed until the final year. The payback method ignores all the cash flows generated after the payback date. In some cases payback period is more useful in real life because it shows how long it takes to recover the original investment, on undiscounted basis. For instance, where high technology obsolescence risks and political risks are involved, payback method is a powerful tool influencing decisions. Some textbooks also advocate the calculation of payback period based on discounted cash flows as well.

2. Discounting Methods: These take into account the time value of the money invested. This is a must for three reasons: (a) All investments have opportunity costs, (b) Risk increases in the future. (Normally, the longer the project, the greater is the uncertainty, which translates into risk premium) and (c) Inflation reduces the value of future cash inflows. Time value of money is calculated through compounding and discounting methods.

• Net Present Value Method: Net Present Value is the difference between the present value of future cash inflows less the present value of the cash outflows. It is calculated as follows:

$$=\sum_{t=0}^{n}\frac{CFn}{(1+r)^{n}}-I$$

where CFn = Cash Flows at the end of the year 'n' r = Discount Rate I = Original Investmentn = Period/Year

By using a discount rate of 10%, the NPV for our project is 4.5M. This shows that the present value of the future cash inflows is 4.5M. Paying 40 M for a project that is worth 44.5M shows that the project makes sense.

• Internal Rate of Return Method: Theoretically, the IRR is the rate that which makes a project NPV zero. IRR is more popular because it is easy to understand. It is the discount rate (r) in the equation:

$$0 = \sum_{t=0}^{n} \frac{CFn}{(1+r)^n}$$

With a pre-programmed calculator or computer, it is easy to calculate IRR. Manually, it can be approximated, (through trial and error) by establishing two rates—one that provides a positive NPV and the other, a negative NPV. Trying 12% and 13%, in our example, will provide NPVs of 1.357 and -0.105 respectively. By interpolating, we get the IRR of 12.93%. If the WACC (Weighted Average Cost of Capital) is below the IRR, then the project will result in value creation to sponsors. Hence WACC is also known as 'hurdle rate'. In fact, the project sponsors would prefer to have fairly large margin of safety between WACC and IRR, depending upon the perceived project risk level.

Assessing Creditworthiness—Building A Lenders' Case

Usually, project promoters approach project lenders only if the financial appraisals of the project are satisfactory. Hence, the role of project lenders is more of the study of credit risk rather than the preparation of financial appraisal. For sound credit risk analysis, a thorough knowledge of the financial modelling and financial analysis is indispensable to understand the various pros and cons of the project. The usual steps followed by a project lender while assessing the project follow the pattern given below:

1. Project Financial Modelling

At this stage most project financiers would like to re-work the base case scenario presented by the promoters. Now-a-days, it is quite easy because most of the financial institutions and lenders have software, facilitating projections.

2. Deriving Lenders' Base Case

The lender should challenge each assumption put forward by the promoters and derive his own base case. Given the long-term nature of the project, it is extremely difficult

to time and determine the quantum of cash inflows and outflows, particularly at the later stages of the project. However, all attempts should be made to take all relevant cash flows into consideration. It needs experience, sound knowledge of the customer's business and should adhere to the guidelines specified for calculation of the project cash flows mentioned earlier.

3. Establishing Debt Amount and Repayment Profile under Base Case

Having drawn up his own base case, the project lender may find it necessary to modify the debt amount and repayment term. This is usually the period of intense negotiation among the project sponsors. While studying the project, if the project lender decides to demand additional capital or subordinated loans from the promoters to make the project financially feasible, the Base Case scenario should be derived after incorporating such adjustments. Finally, the project lender will determine the debt amount he feels acceptable. Relevant terms, covenants and conditions will follow, to cover the risks to the extent possible.

4. Assessing Economic Worth and Debt Service Capabilities

Various ratios are applied to the projected base case to estimate the comfort zone available. We have just discussed the major tools facilitating computation of the economic worth. Now let us see the major ratios which enable the estimation of debt service capabilities. They are Debt Service Coverage Ratio (DSCR), Loan Life Cover Ratio (LLCR) and Project Life Cover Ratio (PLCR), which are described below *(see also Illustration, later)*:

DSCR: This ratio brings out the ability of the project to meet the repayment obligations such an instalments, interest on term loan and other fixed obligations from the anticipated project inflows. DSCR can be either P&L-based or cash-based. Following are the formulas to work it out.

P & L-based DSCR = EBITDA / Repayment Obligations

Cash-based DSCR = Net Cash From Operations / Repayment Obligations

Sometimes, for cash-based DSCR, free cash flows from operations (NCFO-CAPEX) is also used. The higher the ratio, the better.

LLCR: This ratio factors in the worth of the project into the repayment ability. It is computed as below:

= PV of NCFO during the loan term / outstanding loan at the end of each year.

It determines how much the value of the project during the term of credit covers the loan amount. The ratio, if computed at the end of each year against the revised cash flows, based on actual performance, is a powerful tool to measure the future repayment ability.

PLCR: This is again based on the same concept as that of LLCR, but instead of credit term, the entire life of the project is factored into the numerator, as given below:

= PV of NCFO during entire project life/outstanding loan at the end of each year.

Since the ratio factors in the entire life of the project, it gives comfort to the lender that even if the immediate years may not be bright the following years ought to be better, facilitating repayments, despite the risk of rescheduling in the near future.

5. Sensitivity Analysis

In reality, usually the project cash flows are prepared to reflect the future financial positions of complicated and uncertain projects. Project lenders should analyse how changes in various key assumptions and risk factors will affect the borrower's future financial position. All financial appraisal ratios and cover ratios should be subjected to sensitivity analysis. All project lenders will prepare a 'worst case scenario' which shows what would happen to the project's ability to repay the loan on the basis of extremely pessimistic assumptions. A possible list of scenarios to be subjected to stress-testing (or sensitivity analysis) is given below:

- 1. Price variations of major inputs and outputs (related to supplier/market risk)
- 2. Productivity (related to technology/engineering risk)
- 3. Fixed costs (related to technology/cost risk)
- 4. Debt Equity (D/E) (related to funding risk)
- 5. Interest rate changes (related to funding risk)
- 6. Project delay (related to management risk)
- 7. FX fluctuations, etc (related to FX risk)

The important step of identifying which situations are to be stress-tested, lies in understanding the risks involved in the project.

6. Derive Covenant Structure for Documentation

The project agreement documents, especially in the case of syndications, run into hundreds of pages whereby the duties, obligations, liabilities and responsibilities of each project sponsor and participant are clearly mentioned. This too is in fact a risk-covering

exercise so that none of the parties involved may raise disputes on any point. It is not uncommon for some project participants to run for cover when the things go wrong, leaving others to shoulder the losses.

10.8 RISK MITIGANTS

While the project credit risk mitigants differ depending upon the project at hand, in an ideal situation all risks springing from the project study should be covered. All insurable risks should be identified and insured, with assignment to the project financers. Marketing risk should be covered by off-take agreements with escalation clauses. Financial covenants related to cover ratios and other financial ratios should be established. Negative pledges should be obtained. If the project is too risky, strong guarantees from sponsors' banks and/or collaterals have to be obtained. Sufficient sponsor contribution should be ensured to establish their continued interest in the project. Detailed loan agreements are normally entered into between the sponsor and project financiers, detailing mutual obligations and duties with both pre- and post-disbursal conditions. In reality, a few risks will remain open, which the project financers may have to shoulder. A proper project credit analysis will facilitate an informed decision on whether to accept those open risks. Normal project mitigants are:

- Technical Warranties/Guarantees: The project sponsors usually cover the technology risk by taking warranties from the turnkey contractors or technology and machinery suppliers' warranties, sometimes even supported by performance guarantees from their bankers. If engineering risks are critical it may be attempted to make technology/machinery providers, JV partners. Having performance guarantees from contractors can mitigate completion risk. All such agreements should have a provision for liquidated damages.
- 2. **Sales Warranties**: Some of the promoters agree to take up and sell a certain quantity of the output, if it is not saleable as per the projections. This is especially true in cases where a multi-national company with global reach is involved in the project. They agree to market the product in the early years of the project by providing guarantees or warranties. For instance, under sales volume guarantee, one of the promoters agrees to purchase certain volumes of the product that are not sold, or pay to the subject project company an amount equal to the amount the project would have received had these volumes been sold. Usually such agreements mitigate only volume risk but not price risk.

- 3. Off-take Agreements: Long-term off-take agreements with third parties is another way of mitigating the sales/revenue/volume risk. The terms of the off-take agreements should be scrutinized thoroughly by the project lenders to ensure that the counter-party risk is not material.
- 4. **Insurance**: A lot of risks related to political factors, asset quality (fixed assets, stock), protection of the profits, if any (loss of profits policy), loss of key personnel (key man insurance) and similar instances could be covered by adequate insurance cover. Assignment of the insurance proceeds should be in favour of the project lenders.
- 5. **Hedging**: Wherever forex transactions or interest rates are involved, the respective exposures may be hedged, preferably through all stages of the project.
- 6. **Government Guarantees**: In the case of multi-billion projects of national interest it is not uncommon for the governments to extend guarantees. For example, the Enron power project in India (Dhabol) was guaranteed by both the Central and State Governments.
- 7. **Release of Debt Finance on a pro-rata basis**: The project finance proceeds should be disbursed only after the full deployment of the owners' funds or on a pro-rata basis.
- 8. **Debt Service Reserve Account**: In this case the borrower is asked to maintain a separate account to ensure that there is always a credit balance equal to at least the aggregate debt service obligations falling due in the following period.
- 9. Although most of the projects are drawn up without recourse, project lenders ought to try to make recourse to the promoters, wherever possible.
- 10. First charge on the whole assets of the project ought to be assigned to the project lenders with a negative pledge condition.
- 11. Cross collateralization and cross default clauses are to be included so that none of the creditors enjoys any undue advantage. This will ensure that the collaterals enjoyed by one of the participants are available to all, while default with one will be deemed as default of the whole.
- 12. Application of financial covenants such as (a) maximum gearing and debt/ equity ratios (b) minimum shareholder equity, current/quick ratios, DSCRs, LLCRs (c) provision of monthly/quarterly/semi-annually/annually progress reports/ financial statements and (d) dividend restrictions.

The above list is not exhaustive and project mitigants are generally fixed on a caseby-case basis.

ILLUSTRATION

You have recently taken charge as the country head of the credit function of a finance institution, and have been asked to take a decision on a project finance proposal. The salient features of the proposal are given below:

Country Details: While political stability is assured, the economy is heavily dependent on the oil sector, the driving force shaping the overall GDP of economy. International rating agencies have provided a sovereign rating of BBB. The long-term outlook is stable. The country's economy has performed well in recent years due to relatively high world oil/gas prices and robust growth in non-hydrocarbon sectors. In real terms, gross domestic product (GDP) expanded on an average by an estimated 5.0 percent annually in the recent years. Growth has outpaced population growth, thereby raising per capita income. Oil and gas account for around 40% of the GDP, 68% of merchandise export receipts, and over 60% of budget revenue. The manufacturing sector is also showing an upward trend (growth rate around 5.5%), but fluctuating, depending upon the oil prices. While naturally, petrochemicals dominate the manufacturing sector, there are two main steel producers— King Steel Ltd (KSL) and Queen Steel Ltd (QSL)—who cater mostly to the local demand and export to neighbouring countries. Economic forecasts, given below, show reasonable GDP growth for the next few years, but the main risk lies in low oil prices.

Economic Forecast Summary	20 X 1	20 X 2	20X3-20X9
Real GDP (% change)	4.8%	4.9%	5.1%
Consumer prices (% change)	1%	1.5%	1.5%
Current Account (EUR, Billion)			
Goods: Export FOB	55.45	58.41	56.34
Goods: Imports FOB	-40.08	-42.66	-42.86
Trade Balance	15.37	15.75	13.48
External Debt (EUR, Billion)			
Total Debt	19.55	21.66	22.55
Total Debt Service	2.54	2.63	2.11

Overall, the country's total external debt will remain satisfactory despite growth forecast, as the government borrows to finance large industrial and infrastructure projects.

Project: 20 leading business groups have floated a new company Seldom Alloys Co. Ltd (SACL) to set up a plant in the country to manufacture four alloys, namely, Ferro Silicon (FeSi), Silicon Manganese (SiMn), Silicon Metal (SiMe) and Ferro

Manganese (FeMn) as an import substitution. The technology is such that the capacities are inter-changeable, with the only change required in raw material inputs into the furnace. Initially only two alloys—SiMn & SiMe—are planned to be produced. The main domestic steel producers are expected off-take a total annual requirement of 70,000 MT, which will absorb about 56% of the planned capacity of 125,000 MT. The balance is expected to be exported, primarily to neighbouring countries. Project cost and means of finance are given below:

Project Cost		Means	Euro in Thousands
Building	5000	Equity	22875
Furnace & Machinery	65000	LTL	68625
Other Tangible Assets	7500		
Working Cap Margin	9000		
Pre-Op Exp	5000		
	91500		91500

Shareholding Pattern: The largest shareholder, among the 20 shareholders (comprising leading business groups), is Petro Holding Co. Ltd (PHCL), the leading petrochemical manufacturer in the region, with 14% stake, while the smallest stake is 2%. It is explained that many business groups in the country had shown interest in participating and hence the wide spread of the ownership. No public issue is planned now. Articles of association state that most of the critical decisions have to be taken by unanimous consensus by all shareholders.

Technical Study: A technical feasibility study has been conducted and it has been decided to outsource the setting up of the plant to CHP-Menanessan of Austria, which has a successful track record in constructing similar plants. A technical guarantee for two years after commencement of operations is mutually agreed upon.

Market Study: A market study has been conducted, which highlighted the fact that there is scope for import substitution. The largest shareholder, PHCL has a marketing company (Effiless Marketing Ltd-EML), which offered to take up the marketing of finished goods for a 3% commission on sales. Shareholders found that the selling and marketing costs of international competitors exceeded 3% on turnover and decided unanimously to hand over the marketing to EML, which markets a wide range of products of the PHCL group of companies, from petrochemicals to minerals.

Management: The General Manager and Finance Manager (FM) have been identified while the Production Manager is yet to be identified. The sales manager position does

not exist as the entire production is covered by the marketing agreement with EML. While the GM is an eminent professor with PhD in Alloys, the FM is professionally qualified and has around twenty-five years' experience in manufacturing companies.

Key Inputs: Manganese ore accounts for about 30% of the total input while electricity accounts for 35% of the total production costs. Other key inputs are electrodes, etc. No packaging is required as the finished goods will be transported in trucks or trains in bulk. While manganese will be sourced from Africa (Ghana), the electricity (power) in the country is relatively cheap, which is one of the attractive factors that encouraged the promoters. Currently power cost is equivalent to EUR 0.05 per unit.

Competition: In the domestic market, the new entity will enjoy monopoly, being the first such in the country. Initial talks with KSL and QSL are highly encouraging, as they are eager to source from domestic producers. Internationally the competitors are Samancor-South Africa, Elkem-Norway/USA, BHP Temco-Australia, Comargo Correa—Brazil, Ferralloys—South Africa, Nikopol—Ukraine, Pechiney—France, Globe Metal—USA, Xinyu—China, etc. Beyond this, most of the other competitors are highly fragmented. All these companies have the capabilities to switch from one product to another relatively easily. Some of the international competitors have their own manganese mines and enjoy concession power tariffs (e.g. ELKEM).

Financials

See Table 10.2 for detailed projections and appraisal at the end of this chapter.

Weighted Av. Cost of Capital (WACC) 5.9% Net Present Value EUR 60.8M Internal Rate of Return (IRR) 23.3% Pay back Four Years & 2.5 months Payback (discounted) Five Years & 3 months Year 9. Year 1. Year 2. Year 3. Year 4. Year 5. Year 6. Year								
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Overall Break-even	-	45%	33%	30%	27%	25%	23%	22%
Cash Break-even	-	31%	23%	20%	18%	16%	15%	14%
Calculation of DSCR	-	1.60	1.86	1.95	2.04	2.12	2.14	3.10
(based on EBITDA)								
Calculation of DSCR	-	2.00	2.80	3.22	3.68	4.19	4.48	153.65
(based on Post Tax EBITDA)								
Calculation of 'Cash DSCR'	-	(0.35)	2.10	2.92	3.35	3.83	4.37	150.08
Calculation of Loan Life	-	3.29	3.63	3.89	4.15	4.40	4.58	0.00
Coverage Ratio (LLCR)								

The key analytical financial highlights are given below:

The Sales/Relationship team is very upbeat about the project. They argue that it is a rare event whereby twenty business majors in the country agree upon a new venture, which from all angles is a success. It has import substitution products, first in the region. About 60% captive local demand, strong promoters and projected profitability from the first year are some of the major factors highlighted by the Sales Team. The team leader is so enthusiastic that he recommends that entire project finance should be underwritten and a letter of 'right of first refusal' obtained for any additional short-term/long-term financing in future by Seldom Alloys. The team leader is of the opinion that the shareholder guarantees may be difficult to obtain, which may result in loss of opportunity to competitor financial institutions.

As the country head of Credit Risk, you have to forward the proposal to the Board. Critically examine and bring out the major project credit risks.

[Hints. 1 International competitiveness is to be established beyond doubt because of two main inhibiting factors: (a) Cost of shipping in the bulky raw materials — manganese, etc., from abroad and (b) Cost of shipping out the products because of projected exports 2. Plethora of shareholders can result in a stalemate whenever critical unanimous decisions are required. Articles of Association may be changed because even the Companies' Law usually require only three-fourths majority in critical matters. 3. Good employees (production experts) may leave the company. 4. Risk of inadequate working capital. 5. The more you try to reduce the costs, the faster can be the southward trend of selling prices. 6. The raw materials you buy may be bad & wrong (second quality materials). Whenever a large consignment you ordered to take advantage of quantitative discount & minimum transportation cost per tonne arrives in your port, the production facilities may begin to create problems or the unions may think of strike. 7. The production technique you use can eat up the plant & machinery. E.g. (Burning of furnaces). 8. Financial institutions may disburse funds at the wrong time. When you need funds badly, they may ask for more paper work. 9. Cost of your critical inputs may rise sky-high when compared to the ones you estimated in your projections. 10. However hard you try, the quality of the output may be below the standard produced by your competitors. 11. Whatever provision for contingencies you factor into the project cost, you may find the cost overrun is like hyperinflation. 12. The harder you try to reduce the wastage in production, the more may be the actual output of wastage. 13. Your belief in employee loyalty to the company is out of place. 14. Selling prices can go down—especially from China. Competition may get tougher and local buyers may prefer imports and it will be difficult to canvass for protection in the face of WTO. 15. None of the shareholders has any critical stake in SACL. In case of crisis there won't be any major stakeholder to take strong initiative. 16. Spare parts are of specialist nature and usually costly. 17. Top man of the company is an academic devoid of rich practical business experience. 18. Strong

bargaining power of buyers and suppliers—local buyers are a few and so are the key suppliers. 19 Impact of hike in power costs. Check the probability of increase in electricity prices, which is on the higher side, if the electricity companies are currently operating with marginal profitability/ suffering losses. 20. Appointing EML as marketing agency raises some concerns-their marketing expertise is in petrochemicals and not in alloys, which have an entirely different target market & require distinct strategies. 21. Sensitivity Analysis should be conducted altering assumptions on input costs, volume, etc. In fact the project turns unviable if: (a) Electricity cost increases to EUR 0.086/unit from EUR 0.05/unit (b) Selling prices drop by 20%, (c) Capacity utilizations falls below 30% from the projected level (d) Landed cost of manganese ore imports increase by 45% or more, etc. 22. Exports are expected to be around 40%, which means competing with the established international players, some of whom have sustainable competitive advantages, such as captive manganese mines. Basis of exports should be logically sound. 23. Sales team should get shareholder guarantees, as a proof of their trust in SACL. It is better to share the exposure with other FIs in the market, which is always a prudent measure, as it spreads the project credit risk. 24. The credit risk pricing (LIBOR + 100 basis points or 1%) recommended by sales/relationship team and used in the financial appraisal calculation, reflect rather low credit risk perceived in the project, possibly relying on the strength of the promoters. Hence a risk of low pricing also exists, unless strong joint and several guarantees from the financially sound shareholders are obtained covering the full exposure. 25. Risk of local customers relying on imports, if their current suppliers abroad attempt dumping/price undercutting. 26. Instead of paying 3% marketing commission on local sales, SACL ought to attempt to get into long-term off-take agreements with the main two domestic customers— QSL and KSL It appears that the international competitors have more selling expenses as their market geography may be wider, but in SACL's case the domestic marketing expenses ought to be lower, given the different market profile., etc.].

Table 10.2 Project Financing Model.

FINANCIAL SUMMARY SFLDOM ALL	OYS COM	PANY I TD				Amount	in EUR, 000s
1 WACC	015 0000	5 92%					
2 Net Present Value		60.769					
3 Internal Rate of Return (IRR)		23%					
4 Pay Back	Pay Back Four Years & 2.5 months						
5 Pay Back (Discounted)	Five Years & 3 months						
Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
6 Overall Break-even	45%	33%	30%	27%	25%	23%	22%
7 Cash Break-even	31%	23%	20%	18%	16%	15%	14%
8 Calculation of DSCR	1.60	1.86	1.95	2.04	2.12	2.14	3.10
(based on EBITDA)							
9 Calculation of DSCR	2.00	2.80	3.22	3.68	4.19	4.48	153.65
(based on Post Tax EBITDA)							
10 Calculation of 'Cash DSCR'	(0.35)	2.10	2.92	3.35	3.83	4.37	150.08
11 Calculation of Loan Life	3.29	3.63	3.89	4.15	4.40	4.58	0.00
Coverage Ratio (LLCR)							

1. Project Cost & Means				Amount in EUR, 000s
Building	5,000	Equity	22,875	
Plant & Machinery	65,000	Project Finance	68,625	
Other Fixed Assets	7,500	5		
Working Cap Margin	9,000			
Pre-Op	5,000			
-	91,500		91,500	
L				

2. Operational Info							Amount	in EUR, 000s
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Capacity of SiMn* 75,000 MT								
Capacity of SiMe# 50,000 MT								
Capacity Utilization	0%	60%	75%	80%	85%	90%	90%	90%
Output - SiMn	0	45,000	56,250	60,000	63,750	67,500	67,500	67,500
Output - SiMe	0	30,000	37,500	40,000	42,500	45,000	45,000	45,000
*SiMn= Silicon Manganese	#SiA	1e= Silicon .	Metal					

3. Profit & Loss Statement							Amount	in EUR, 000s
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Sales	0	125,460	159,962	174,038	188,614	203,703	207,777	211,933
Cash Operating Expenses	0	86,343	107,499	116,255	125,319	134,698	137,392	140,140
Cash Operating Margin	0	39,117	52,462	57,783	63,295	69,005	70,385	71,793
- Depreciation	0	5,383	5,458	5,552	5,669	5,816	5,999	6,228
- Amortization	0	1,000	1,000	1,000	1,000	1,000	0	0
Operating Profit (PBIT)	0	32,734	46,004	51,231	56,626	62,189	64,386	65,565
- Interest	0	4,876	3,621	2,868	2,230	1,593	956	319
Profit before tax	0	27,857	42,382	48,363	54,396	60,596	63,430	65,246
(Tax rate)	35%	35%	35%	35%	35%	35%	35%	35%
- Income tax	0	9,750	14,834	16,927	19,038	21,209	22,201	22,836
NET PROFIT	0	18,107	27,549	31,436	35,357	39,388	41,230	42,410
Reconciliation of the Net I	Profit							
Retained Profit brought forw	ard	0	18,107	41,081	65,654	89,574	117,524	147,316
Net Profit for the year		18,107	27,549	31,436	35,357	39,388	41,230	42,410
Less : Dividends		0	4,575	6,863	11,438	11,438	11,438	11,438
Add/Less : Other Adjustmen	ts	0	0	0	0	0	0	0
Retained Profit carried forwa	rd	18,107	41,081	65,654	89,574	117,524	147,316	178,289

4. Duritant Crack Elana (Indianat)	(f = 4h = -1)						Amount	in EUR, 000s
4. Project Cash Flows (Indirect M					/			
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Operating Cash Flow								
Operating Profit	0	32,734	46,004	51,231	$56,\!626$	62,189	64,386	65,565
Depreciation/Non-Cash Items	0	6,383	6,458	6,552	6,669	6,816	$5,\!999$	6,228
Adjusted (Gross) Cash Flow	0	39,117	52,462	57,783	63,295	69,005	70,385	71,793
From Operations								
W/C Movement								
(Inc)/Dec in Stock	0	(21, 290)	(5, 217)	(2, 159)	(2,235)	(2,313)	(664)	(678)
(Inc)/Dec in Debtors	0	(30, 935)	(8,507)	(3, 471)	(3, 594)	(3,721)	(1,005)	(1,025)
Inc/(Dec) in Creditors	0	17,742	4,347	1,799	1,862	1,927	554	565
Other Net W/C Movements	0	0	0	0	0	0	0	0
Net Cash flow from Operations	0	4,633	43,086	53,952	59,329	64,899	69,270	70,655
Less: Taxation Paid	0	(9,750)	(14, 834)	(16, 927)	(19,038)	(21, 209)	(22, 201)	(22, 836)
Less: Interest Paid	0	(4, 876)	(3, 621)	(2,868)	(2,230)	(1, 593)	(956)	(319)
Net Free Cash flow from	0	(9,993)	24,630	34,157	38,060	42,097	46,113	47,500
Operations		.,,,,						
Less: Dividends Paid	0	0	(4, 575)	(6, 863)	(11, 438)	(11, 438)	(11, 438)	(11, 438)
Other Cash outflow	0	0	0	0	0	0	0	0
Net Cash flow before Inv.	0	(9,993)	20,055	27,295	26,622	30,660	34,676	36,063
& Fin. Act.		,				·		Contd

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7			
Cash Flow from Inv. Act.											
Net Cash flow from Fixed	(77, 500)	(500)	(750)	(938)	(1, 172)	(1, 465)	(1,831)	(2,289)			
Asset											
Other Income	0	0	0	0	0	0	0	0			
Net Intra-Group Funds Flow	0	0	0	0	0	0	0	0			
Other	(5,000)	0	0	0	0	0	0	0			
Net Cash flow before Equity	(82, 500)	(10, 493)	19,305	26,357	$25,\!451$	29,195	32,845	33,774			
& Fin. Act.											
Cash Flow from EQ. & Fin.	Cash Flow from EQ. & Fin. Act.										
Inc/(Dec) in Equity	22,875	0	0	0	0	0	0	0			
Inc/(Dec) in S-T Debt	0	0	0	0	0	0	0	0			
Inc/(Dec) in L-T Debt	68,625	0	0	0	0	0	0	0			
Inc/(Dec) in Subordinated	0	0	0	0	0	0	0	0			
Debt											
Net Cash flow from Eq. &	91,500	(9,804)	(9,804)	(9,804)	(9,804)	(9,804)	(9,804)	(9,804)			
Fin. Act.											
Other Cash Movements	0	0	0	0	0	0	0	0			
Total	91,500	(9,804)	(9,804)	(9,804)	(9,804)	(9,804)	(9,804)	(9,804)			
Net Change in Cash	9,000	(20, 297)	9,502	16,554	15,647	19,391	23,041	23,970			
Add Opening Cash	0	9,000	(11, 297)	(1,795)	14,759	30,406	49,797	72,838			
Closing Cash	9,000	(11, 297)	(1,795)	14,759	30,406	49,797	72,838	96,809			

5. Balance Sheet	Amount in EUR, 000s Balance Sheet								
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
Assets									
Cash & Bank	9,000	0	0	14,759	30,406	49,797	72,838	96,809	
Receivables	0	30,935	39,443	42,914	46,508	50,228	51,233	52,257	
Stocks	0	21,290	26,507	28,666	30,900	33,213	33,877	34,555	
Fixed assets (net)	77,500	72,617	67,908	63,294	58,796	54,445	50,278	46,339	
Capitalized expenses (net)	5,000	4,000	3,000	2,000	1,000	0	0	0	
Total assets	91,500	128,842	136,858	151,632	167,610	187,684	208,226	229,960	
Liabilities									
Short-Term Bank Borrowings	0	11.297	1.795	0	0	0	0	0	
Suppliers	0	17,742	22,089	23,888	25,750	27,678	28,231	28,796	
Term Debt (Current Portion)	9,804	9,804	9,804	9,804	9,804	9,804	9,804	0	
Term Debt	58,821	49,018	39,214	29,411	19,607	9,804	0	0	
Shareholder Funds									
Accumulated reserves	0	18,107	41,081	65,654	89,574	117,524	147,316	178,289	
Capital	22,875	22,875	22,875	22,875	22,875	22,875	22,875	22,875	
Total liabilities and	91,500	128,842	136,858	151,632	167,610	187,684	208,226	229,960	
net worth									

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Part 3: CREDIT RISKS—PROJECT & WORKING CAPITAL

6. Key Ratios							Amount is	n EUR, 000s
·	Year ()	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Performance & Profitabilit	v	Icui I	Icui 2	icui o	Icul I	icui o	icui o	Icui /
OPM	, NA	26.09%	28.76%	29.44%	30.02%	30.53%	30.99%	30.94%
SOCE	NA	1.13	1.39	1.36	1.33	1.27	1.15	1.05
ROCE	NA	29.46%	40.08%	40.10%	39.92%	38.87%	35.77%	32.59%
ROE	NA	44.18%	43.07%	35.51%	31.44%	28.05%	24.23%	21.08%
Liquidity								
CR	NA	1.34	1.96	2.56	3.03	3.55	4.15	6.38
QR	NA	0.80	1.17	1.71	2.16	2.67	3.26	5.18
Capital Structure								
Gearing	NA	1.71	0.79	0.44	0.26	0.14	0.06	0.00
Debt/ Equity	3.00	2.14	1.14	0.71	0.49	0.34	0.22	0.14
Total Leverage Ratios								
Operating	NA	1.51	1.37	1.33	1.31	1.29	1.27	1.27
Financial	NA	1.18	1.09	1.06	1.04	1.03	1.02	1.00
Total	NA	1.77	1.48	1.41	1.36	1.32	1.29	1.28
Growth								
Sales - Value	NA	NA	28%	9%	8%	8%	2%	2%
Net Profit	NA	NA	52%	14%	12%	11%	5%	3%
7 Annraisal Ratio							Amount is	n EUR, 000s
		N 7 0						
Colorlation of WACC		Year 0						
Carculation of WACC		6 50%						
Cost of Equity		11.0%						
Post Tax Cost of Debt		4.2%						
Weighted Debt Cost	2	2,899						
Weighted Equity Cost	(4	2,516						
(pre-dividend)								
WACC		5.92%						
9 Not Descent Value							Amount is	n EUR, 000s
o. Net rresent value								
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Project Cost	(91,500)							
Cash Flows Available	0	(5,117)	28,252	37,025	40,290	43,690	47,069	47,819
For Project Lenders								
Discount rate to be applied	10%	10%	10%	10%	10%	10%	10%	10%
tor NPV calculation	1.00	0.01	0.00	0.55	0.00	0.00	0.50	0.51
Discount factor for this rate	(01 500)	(4.659)	0.83	0.75	0.68	0.62	26 560	94 520
NPV of Cash Inflows	(91,500) 60 760	(4,032)	23,348	27,017	27,519	27,128	20,009	24,339
INI V UI Casil IIIIUWS	00,703							

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Project Cost	(91,500)	(5.117)	98 959	27 095	40.900	42 600	47.060	47 810
IRR of the Investment	23.3%	(3,117)	26,232	37,023	40,290	43,090	47,009	47,019

10. Pay Back							Amount	in EUR, 000s
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Project Cost Cash Flows Available For Project Lenders	(91,500) 0	(5,117)	28,252	37,025	40,290	8,950		
	Fo	our Years a	& 2.5 mon	ths				

11. Pay Back (Discounted)							Amount	in EUR, 000s
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Project Cost Discount Rate Discounted Cash Flows	(91,500) 10% F	10% (4,652) Sive Years	10% 23,348 & 3 month	10% 27,817 ns –B	10% 27,519	10% 27,128	10% 9,662	

12. Break-Even Calculation						Amount	in EUR, 000s
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Contribution Margin Per Unit - SiMn	704	718	732	747	762	777	793
Contribution Margin Per Unit - SiMe	587	598	610	622	635	648	660
Contribution Margin (AGGREGATE)	1,290	1,316	1,342	1,369	1,397	1,425	1,453
Contribution Margin Ratio - SiMn	43%	43%	43%	43%	43%	43%	43%
Contribution Margin Ratio - SiMe	34%	34%	34%	34%	34%	34%	34%
Contribution Margin (AGGREGATE)	38%	38%	38%	38%	38%	38%	38%
Fixed Costs (inl. Interest Costs/ Dep.)	21,409	20,432	19,979	19,670	19,394	18,160	17,976
Cash Fixed Costs	15,025	13,973	13,427	13,001	12,579	12,161	11,748
Total Break-Even Sales	55,849	53,300	52,118	51,312	50,594	47,374	46,893
Overall Break-Even—as a % of	45%	33%	30%	27%	25%	23%	22%
Projected Sales							
Margin of Safety	69,611	106,661	121,920	137,301	153,109	160,403	165,039
Margin of Safety—as a % of	55%	67%	70%	73%	75%	77%	78%
Project Sales							
							Contd

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Part 3: CREDIT RISKS—PROJECT & WORKING CAPITAL

Cash Break-Even Sales	39,196	36,452	35,026	33,914	32,814	31,725	30,647	
Cash Break-Even—as a % of	31%	23%	20%	18%	16%	15%	14%	
Projected Sales								
Cash Margin of Safety	86,264	123,509	139,012	154,699	170,889	176,052	181,285	
Cash Margin of Safety-as a % of	69%	77%	80%	82%	84%	85%	86%	
Project Sales								

						Amount	in EUR, 000s
13. Calculation of DSCR (based on EBIT	DA)						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Sources							
Net Profit before tax	27,857	42,382	48,363	54,396	60,596	63,430	65,246
Add: Depreciation/Amortization	6,383	6,458	6,552	6,669	6,816	5,999	6,228
Add: Interest Costs	4,876	3,621	2,868	2,230	1,593	956	319
Available for Repayments (A)	39,117	52,462	57,783	63,295	69,005	70,385	71,793
Repayment obligations							
Interest	4,876	3,621	2,868	2,230	1,593	956	319
Tax Obligation	9,750	14,834	16,927	19,038	21,209	22,201	22,836
Term-Loan Instal.	9,804	9,804	9,804	9,804	9,804	9,804	0
T/L repayment obligations (B)	24,430	28,259	29,598	31,072	32,605	32,960	23,155
DSCR per annum (C)	1.60	1.86	1.95	2.04	2.12	2.14	3.10

14. Calculation of DSCR (based on Post	Tax EBITD	A)				Amount	in EUR, 000s
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Sources							
Net Profit After Tax	18,107	27,549	31,436	35,357	39,388	41,230	42,410
Add: Depreciation/Amortization	6,383	6,458	$6,\!552$	6,669	6,816	5,999	6,228
Add: Interest Costs	4,876	3,621	2,868	2,230	1,593	956	319
Available for Repayments (A)	29,367	37,628	40,856	44,257	47,796	48,184	48,957
Repayment obligations							
Interest	4,876	3,621	2,868	2,230	1,593	956	319
Term-Loan Instal.	9,804	9,804	9,804	9,804	9,804	9,804	0
T/L repayment obligations (B)	14,680	13,425	12,671	12,034	11,397	10,759	319
DSCR per annum (C)	2.00	2.80	3.22	3.68	4.19	4.48	153.65

Amount in EUR, 000s									
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7		
Cash flow available for debt service (CFD)	(5,117)	28,252	37,025	40,290	43,690	47,069	47,819		
Annual debt service (DS)	14,680	13,425	12,671	12,034	11,397	10,759	319		
Debt Service Coverage Ratio (DSCR)	(0.35)	2.10	2.92	3.35	3.83	4.37	150.08		

16. Calculation of Loan	Life Co	verage Rat	tio (LLCR)					Amount	in EUR, 000s
		Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Cash flow available for or service (CFD)	debt		(5,117)	28,252	37,025	40,290	43,690	47,069	47,819
Discount rate to be appl to CFD Annual discount	ied	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%
factor for the selected discount rate	Zear 0 Zear 1 Zear 2 Zear 3 Zear 4 Zear 5 Zear 6 Zear 7	1.000	0.939 1.000	0.882 0.939 1.000	0.828 0.882 0.939 1.000	0.777 0.828 0.882 0.939 1.000	0.730 0.777 0.828 0.882 0.939 1.000	$\begin{array}{c} 0.685\\ 0.730\\ 0.777\\ 0.828\\ 0.882\\ 0.939\\ 1.000\\ \end{array}$	$\begin{array}{c} 0.644\\ 0.685\\ 0.730\\ 0.777\\ 0.828\\ 0.882\\ 0.939\\ 1.000\\ \end{array}$
Present value of the annual CFD	Tear 0 Tear 1 Tear 2 Tear 3 Tear 4 Tear 5 Tear 6 Tear 7		(4,804) (5,117)	24,908 26,527 28,252	30,651 32,643 34,765 37,025	31,319 33,354 35,522 37,831 40,290	31,889 33,961 36,169 38,520 41,024 43,690	32,258 34,355 36,588 38,966 41,499 44,196 47,069	30,772 32,772 34,902 37,171 39,587 42,160 44,900 47,819
Present value of future CFD for each year		Year 0 176,992	Year 1 193,613	Year 2 177,947	Year 3 152,488	Year 4 122,110	Year 5 86,357	Year 6 44,900	Year 7 0
Outstanding debt as of		68,625	58,821	49,018	39,214	29,411	19,607	9,804	0
Loan Life Coverage Ratio (LLCR)		2.58	3.29	3.63	3.89	4.15	4.40	4.58	
17. Working Notes								Amount	in EUR, 000s
a. Sales/Turnover		Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Price of SiMn Annual increase of the p Sales volume of A Income from sales of Price of SiMe	orice SiMn	1,600 0 1,700	1,632 2% 45,000 73,440 1,734	1,665 2% 56,250 93,636 1,769	1,698 2% 60,000 101,876 1,804	1,732 2% 63,750 110,408 1,840	1,767 2% 67,500 119,241 1,877	1,802 2% 67,500 121,626 1,914	1,838 2% 67,500 124,058 1,953
Annual increase of the p Sales volume of B Income from sales of S Total Sales/Revenue	orice SiMe	0	30,000 52,020 125,460	2% 37,500 66,326 159,962	2% 40,000 72,162 174,038	2% 42,500 78,206 188,614	2% 45,000 84,462 203,703	2% 45,000 86,151 207,777	2% 45,000 87,874 211,933

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Part 3: CREDIT RISKS—PROJECT & WORKING CAPITAL

17. Working Notes							Amount	in EUR, 000s
b. Expenses	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Variable unit cost of SiMn								
Material Cost	330							
Electricity charges	227							
Electrodes	114							
Labour	76							
Production supplies	58							
Marketing fees	25							
Other Variable Costs (Packing,	80							
Shipping, Handling, Selling, etc)								
Total Variable Cost of SiMn	910	928	947	966	985	1005	1025	1045
Annual increase of this cost	0	2%	2%	2%	2%	2%	2%	2%
Variable unit cost of SiMe								
Material Cost	383							
Electricity charges	325							
Electrodes	158							
Labour	135							
Production supplies	43							
Marketing fees	31							
Other Variable Costs (Packing,	50							
Shipping, Handling, Selling, etc)								
Total Variable Cost of SiMe	1,125	1148	1170	1194	1218	1242	1267	1292
Annual increase of this cost	0	2%	2%	2%	2%	2%	2%	2%
Cash Overheads								
Personnel expense	7,000							
Maintenance expense	2,000							
Insurance	500							
Leasing, administration, services	450							
and other fixed expenses								
Total fixed expenses	9,950	10149	10352	10559	10770	10986	11205	11429
Annual increase of these	0	2%	2%	2%	2%	2%	2%	2%
expenses								
Total Variable Expenses of	0	41,769	53,255	57,942	62,795	67,818	69,175	70,558
SiMn								
Total Variable Expenses of	0	34,425	43,892	47,754	51,754	55,894	57,012	58,152
SiMn								
Aggregate Variable Costs		76,194	97,147	105,696	114,548	123,712	126,186	128,710
Overheads		10,149	10,352	10,559	10,770	10,986	11,205	11,429
Cash Operating Expenses		86,343	107,499	116,255	125,319	134,698	137,392	140,140

17. Working Notes							Amount	in EUR, 000s
c. Schedule of Fixed Assets	, Intangibl	es, Depre	ciation &	Amortiza	ation			
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Land & Building Plant & Machinery Other Fixed Assets Routine Investment in Fixed Assets	5,000 65,000 7,500 0	500	750	938	1,172	1,465	1,831	2,289
L & B - Depreciation term (years)	20 15							
term (years) Depreciation term (years) - Others/Routine CAPEX	10							
capitalized expenses	5,000							
Depreciation of fixed assets- L&B	0	250	250	250	250	250	250	250
Depreciation of fixed assets- P&M	0	4,333	4,333	4,333	4,333	4,333	4,333	4,333
Depreciation of fixed assets- Other FA	0	750	750	750	750	750	750	750
Depreciation of fixed assets- Routine Addition	0	50	125	219	336	482	666	894
Total Depreciation Charge for the year A	0	5,383	5,458	5,552	5,669	5,816	5,999	6,228
Amortization of capitalized expenses B	0	1,000	1,000	1,000	1,000	1,000	0	0
Total Depreciation/ Amortization A+B	0	6,383	6,458	6,552	6,669	6,816	5,999	6,228
Fixed Assets Schedule								
Gross fixed assets Accumulated depreciation Net fixed assets	77,500 0 77,500	78,000 5,383 72,617	78,750 10,842 67,908	79,688 16,394 63,294	80,859 22,063 58,796	82,324 27,879 54,445	84,155 33,878 50,278	86,444 40,105 46,339
Intangible Asset Schedule								
Gross capitalized expenses	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Accumulated amortization Net capitalized expenses	0 5,000	1,000 4,000	2,000 3,000	3,000 2,000	4,000 1,000	5,000 0	5,000 0	5,000 0

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Part 3: CREDIT RISKS—PROJECT & WORKING CAPITAL

17. Working Notes							Amount	in EUR, 000s
d. Schedule of Loans & Re	payment							
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Initial amount of debt	68,625							
Repayment term (years)	7							
Annual repayment	0	9,804	9,804	9,804	9,804	9,804	9,804	9,804
Amount of debt at year end	68,625	58,821	49,018	39,214	29,411	19,607	9,804	0
Average amount of debt	68,625	63,723	53,920	44,116	34,313	24,509	14,705	4,902
Reference interest rate	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
(Euribor or other)								
Spread	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Interest rate of debt	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%
Annual Interest Costs–		4,142	3,505	2,868	2,230	1,593	956	319
Long-Term		,	,	,	,	,		
Annual amount of interest-		734	117	0	0	0	0	0
Short-Term								
Total Annual Interest Costs		4,876	3,621	2,868	2,230	1,593	956	319
Annual debt service		14,680	13,425	12,671	12,034	11,397	10,759	10,122
(principal + interest)								
L								
17 Working Notes							Amount	in EUR, 000s
e. Working Capital Change	es							
Nor	ms (days)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7

	Norms (days)	Year 1	Year 2	Year 3	Year 4	Year 5	Year b	Year 7	
Stocks	90	21,290	26,507	28,666	30,900	33,213	33,877	34,555	
Receivables	90	30,935	39,443	42,914	46,508	50,228	51,233	52,257	
Suppliers	75	17,742	22,089	23,888	25,750	27,678	28,231	28,796	
W/C Cycle	105	34,484	43,860	47,691	51,658	55,764	56,879	58,016	



Credit Risks in Working Capital

Working capital is the blood of business. No business can survive without adequate working capital. A business without sufficient working capital is like an anaemic person. Just as all interested parties will be concerned about an anaemic person, so will suppliers of credit if their customer displays symptoms of business anaemia—viz. lack of working capital impacting creditworthiness.

Let us examine the nature of working capital, as the first step towards understanding the major credit risks involved. Working capital is that part of the capital required to purchase raw materials, meet the salaries and wages of employees, meet movement expenses of goods and similar recurring expenses. It takes into account trade credit to customers and from suppliers. The timing mismatch of the transfer to title of the product and settlement of dues along with routine expenses (salaries, communication expenses, etc) give rise to the demand for short-term funds, generally known as working capital funding requirement.

11.1 DEFINITION OF WORKING CAPITAL

The usual balance sheet definition of working capital is given below:

Working Capital = Current Assets - Current Liabilities

Current assets are those assets of the business, which are expected to be converted into cash within a time frame of one year, while current liabilities are the ones to be settled within a year.

As we have seen in Chapter 8, balance sheet is a powerful tool facilitating credit risk study. It helps working capital analysis as well. The balance sheet shows the working

capital as on a particular day, and we have to assume this as the average situation for the year/period, given the dynamic nature of working capital. If the position as reflected in the balance sheet is not reflective of an 'average' situation, the credit executive should derive an average case based on the understanding of the business, especially its cash flows, developed through discussions/customer visits, among others. Now let us focus on the definition of working capital. Let us use the following example for ease of understanding:

Example. 11.1

LIABILITIES (\$)		ASSETS (\$)	
Share Capital	20,000	Fixed Assets	26,000
Retained Earnings	16,000	Investments	2,000
Long-Term Loan	10,000		
0		Stock	16,000
Trade Creditors	16,000	Trade Debtors	18,000
Accruals & Others	6,000	Cash & Others	6,000
Total	68000	Total	68000

Following is the balance sheet of ABC Ltd.

The working capital gap = (16000 + 18000 + 6000) - (16000 + 6000)= 40,000 - 22,000 = 18,000/-

This is the average working capital situation which is expected to continue in the immediate future. Any time during this period, ABC Ltd needs \$40,000/- in current assets, while it is certain of getting trade credit and other creditors of \$22,000/-. It also shows that the current assets are only partly financed by current liabilities and the \$18000 comes from certain other sources. From where does ABC Ltd bring funds to meet the working capital requirements? The long-term sources (share capital, retained earnings & LTL) amount to \$46,000/- while the long-term uses (fixed assets & investments) are \$28,000. So the long-term contribution to the W/C, is \$18,000/-.

11.2 WORKING CAPITAL CYCLE

It refers to the time taken for the business activity (or operation) to complete its course. It can be easily explained by the following example of a trader:

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M/s. ABC Co, a trading firm, places an order on a particular day and receives the goods after 15 days. The supplier, who usually extends 30 days' credit, is settled on time. The goods are kept in the warehouse for 45 days, when they are sold on credit to XYZ Ltd, who usually enjoys 60 days' credit from ABC Co. XYZ Ltd pays on time, completing the trading activity or trade cycle of this particular transaction. We can summarize these events as follows:

Day	Activity
0	Place the order
After 15 days	Receipt of goods on 30 days' credit
After 30 days	Settle the supplier
45 days after the receipt of goods	Sales on credit of 60 days
60 days thereafter	Collect the dues from the debtor (i.e. XYZ Ltd)

The working capital cycle starts from the date of receipt of goods and not from the date of placing the order, because the supplier may not supply the goods and there is a possibility of cancellation by mutual understanding, or the agreement may contain certain situations when the transaction may not happen at all. (In real life other situations are likely, such as advance payment for goods, in which case the working capital cycle starts from the date on which money is advanced.) The operating cycle starts with the receipt of inventory and ends with the collection of the money from XYZ Ltd. In the balance sheet, we can notice the progress of the operating cycle from inventory to trade debtors to cash. Why are we not speaking about the trade creditors, who are extending 30 days' credit? Well, in the strict sense, the operating cycle does not take the trade creditors' period into account, but "cash cycle or working capital cycle" does.

Cash Cycle/Working Capital Cycle = Operating Cycle – Average Trade Creditors Payment period.

Where Operating Cycle = Average Inventory Holding Period* + Average Debtors Collection Period

* In the case of a manufacturing entity, it can be subdivided into average raw material holding period, average work in progress period and average finished goods holding period.

In the case of this transaction of ABC, the operating cycle is 45 days' of inventory holding plus credit period allowed to XYZ of 60 days', totalling 105 days'. Cash (or W/C) cycle is 105 - 30 = 75 days.

The above example considers just one trading activity by ABC Co. In reality, during the course of year, ABC will be entering into hundreds of similar transactions, and we use activity ratios (or turnover ratios) to get an idea about the average working capital cycle and operating cycle, with the help of P&L and B/S.

11.3 DIFFERENCE OF WORKING CAPITAL Vs FIXED CAPITAL

Those who deal in corporate finance, finance management or financing of business know that working capital problems are different from fixed capital problems. While it is relatively easy to understand fixed capital requirements, calculation of working capital requirements is somewhat difficult. A company can easily compute the total cost of the plant and machinery, computers and vehicles it wants to buy and find out how much funds it should raise.

However, a business cannot compute working capital requirements so easily. It cannot say that it needs XX million for working capital and go out and spend XX million acquiring it. The tragedy is that many people think of working capital in these terms and find themselves in trouble.

First of all, nobody can calculate working capital requirements exactly, because working capital is dynamic. For instance, a manufacturing company will not alter the number of vehicles or P&M everyday, but the stock will fluctuate. The company will be accepting new truckloads of raw materials, while sending finished goods to buyers. Some debtors might be paying up while suppliers pressurize for speedier payments. These factors explain why working capital is dynamic.

Working capital is constantly changing, and this change is affected by a number of factors, depending upon business circumstances. Accordingly, a company can only make an estimate of its working capital requirements. As we have discussed earlier, the balance sheet approach to working capital provides an approximation or average situation in day-to-day business situation. While a conscious decision to buy an item of fixed asset is easy to predict and anticipate, a company may not easily realize what is happening to working capital and related financing requirement as trading circumstances alter.

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11.4 WORKING CAPITAL BEHAVIOUR AND VOLUME CHANGES

Assume that ABC (in our previous example) is lucky to get huge orders that will double the sales on the same terms and conditions. What will be the impact on the working capital components? The stock, debtors and creditors will also double in accordance with the volume growth. Accordingly, stock, debtors and other debtors would become 32,000, 36,000 & 12,000 respectively, while trade creditors and accruals would be 32,000 & 12,000/-. What is the working capital gap now? 32,000 + 36,000 + 12,000 - 32,000 - 12,000 = 336,000/-. But, the long-term contribution is just 18,000/-. So, there is a shortfall is 18,000/-. Since the suppliers and other creditors will not increase credit period, the options are: (a) Owners bring in funds or (b) Rely on bank credit. Most businesses prefer bank credit despite sufficiency of funds with the owners, because of the inherent tax advantages of the borrowing.

So changes in the scale of operation will impact W/C funding.

However, it should be borne in mind that not all businesses will encounter working capital deficit with higher volumes. In the case of predominantly cash-based businesses such as retailers, where the suppliers extend liberal credit while the entire sales are on cash basis, higher volume will mean more cash! It is clear from the following example of a textile retailer, whose balance sheet is as follows:

Example 11.2

Balance Sheet of PQR textile shop partnership

LIABILITIES (\$)		ASSETS (\$)		
Capital/Reserves	270,000	Fixed Assets	240,000	
Long-term Loan	10,000	Investments	150,000	390,000
Suppliers Credit	600,000	Stock		300,000
		Trade Debtors		100,000
		Cash & Bank		90,000
Total	880,000	Total		880,000

In this case, the long-term assets of the company are only partially funded by the LTL. The rest is funded by the short-term funds, suppliers' credit. Won't the company struggle for liquidity? Although the traditional current & quick ratio will indicate some sort of crisis, the firm's liquidity is satisfactory, because of the nature of business. [It should be borne in mind that the interpretation of ratios should be done in the context of nature of business.] The CR and QR are 0.81:1 & 0.67:1 respectively.

The trick lies in the nature of business and its impact on the current assets and liability. Suppose the turnover of the above mentioned textile shop is Rs. 3,650,000 (Rs 10,000 per day). Then the average collection period, stock-holding period and creditors' payment period would be 10 days (Debtors / Sales \times 365), 30 days (Stock / Sales \times 365) and 60 days (Creditors / Sales \times 365) respectively. Although the balance sheet shows that the suppliers' creditors stands at 600K against which current assets of only 490K are available, the company can easily meet the current obligations because of the cash nature of the business. The explanation is as follows:

It means PQR will have to make the payment to creditors on the 60th day while the stock will sold in 30 days and the debts will be collected in ten days. That means PQR enjoys a float of 20 days. (60-30-10). Considering the daily sales of Rs. 10,000 the cash float would be Rs. 200, 000. (In the balance sheet the cash and bank is 90K. It means the balance is reflected under Fixed Assets & Inv.)

What will happen if the retailer doubles the volume on the same terms and conditions?

Suppliers, stock and debtors would become Rs. 1,200,000, Rs. 600,000 and Rs. 200,000 respectively. Now the total cash float would be Rs. 400,000. It will enjoy an additional cash float of Rs. 200,000 when the volume doubles! In situations like this the business does not require any cash funding from banks. These types of businesses, if shrewdly managed, will result in utilizing cost-free funds for expansion as well. It is well known that in the US, certain chains of restaurants and super markets in fact use the liquidity generated by one retail store to fund the establishing of the next store and so on!

11.5 WORKING CAPITAL BEHAVIOUR AND CHANGES IN TRADE TERMS

Another instance of variation in working capital requirement normally occurs when the terms of trade change. Let us summarize the impact of such changes on the working capital of a business.

a. Change in suppliers' terms: If the suppliers reduce the credit period, then the working capital requirement will increase, and vice-versa. Lenders should be cautious about the latter situation because imprudent business managers may use the excess liquidity for non-core or long-term purposes, triggering a liquidity crisis later.

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- *b. Change in stock holding period*: Any reduction will reduce working capital requirement, and vice-versa
- *c. Change in debtors' collection period*: Any increase will result in higher working capital requirement and vice-versa.

11.6 WORKING CAPITAL AND CASH FLOWS

Working capital cash flows are an important part of any business and account for the bulk of cash movements. Indirect Cash Flow Method, common in audited financials, captures the net movements in the working capital components while Direct Cash Flow Method reflects gross movements. The impact of the various situations on cash flows is summarized below:

- a. Increase/Decrease in Working Capital Components: An increase in current asset components such as stock and debtors and reduction in trade and other current creditors results in absorption of cash and hence reduces the cash available. Decline in current assets and increase in current liabilities have the opposite effect.
- *b. Change in Volume*: W/C is directly related to volume changes. With other things remaining the same, increase in volume necessitates more W/C cash absorption and vice-versa.
- *c. Change in Trade Terms*: Favourable changes (e.g. lower credit period to customers/higher credit from suppliers) in trade terms reduces W/C requirement, while adverse change in trade terms increases it.
- *d. Changes in Profitability*: Higher profitability affects working capital favourably, if the profits are retained in the business. Although the higher volume necessitates additional working capital, if profitability improves, the additional working capital requirement caused by volume would be proportionately lower. Similarly, while reduction in volume releases working capital, losses or reduction in profitability can quash such an impact.

While the working capital impact 'a, b and c' are straightforward, that of profitability is bit circuitous, which is explained by way of the following example.

Example 11.3

Currently PQR Ltd has sales of \$1000 with cost of sales being \$700. The selling, admin expenses, including depreciation (\$30) on fixed assets is \$250/- Accordingly, the net profit for the year is \$50 with an NPM of 5%. Trade terms are: Stock holding period @30 days, debtors' collection @90 days, creditors' payment period @60 days. Ascertain the impact on the cash flows when

- a. Volume increases by 50%
- b. Volume increases by 50% while NPM also improves to 14% and
- c. Volume declines by 30% and NPM drops to negative 26%.

Answer:

a. Calculation of Cash Flows

Particulars (in \$)	Case I Vol. Increase @50% (same NPM)	Case II Vol. Increases @50% (NPM@14%)	Case III Vol Declines (NPM – 26%)
Net Profit (see Working	75	205	-180
Note A)	2 30	30	30
CE before WC Charges	105	995	150
WC Components: (See Note B)	105	200	-150
Change in Stock	-29	-20	6
Change in Debtors	-123	-123	74
Change in Creditors	58	40	-12
W/C Changes	-95	-103	68
Net Cash From Operations	10	132	-82

Working Notes:

- A. Calculation of Net Profit
- B. Calculation of W/C Variables
- See the table $A \ \mathfrak{S} B$ on next page.

As is evident from the above, while the turnover jumps by 50% with the same NPM and trade terms, the business entity would have a small surplus of \$ 10K from
A. Particulars (in \$)	Base Case	Case I Vol. Increase @50% (same NPM)	Case II Vol. Increases @50% (NPM@14%)	Case III Vol Declines (NPM – 26%)
		(A)	(B)	(C)
Sales	1000	1500	1500	700
COS	700	1050	945	630
Other Business Exp.*	250	375	350	250
Net Profit	50	75	205	-180
NPM	5%	5%	14%	-26%
* includes depreciation	and other nor	n-cash charge of 30K		

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B. Particulars (in \$)	Base Case	Case I Vol. Increase @50% (same NPM)	Case II Vol. Increases @50% (NPM@14%)	Case III Vol Declines (NPM – 26%)
Stock (30 days)	58	86	78	52
Debtors (90 days)	247	370	370	173
Creditors (60 days)	115	173	155	104

operations. On the other hand, if the NPM improves to 14%, the increase in profits offsets the enhanced W/C requirement and results in sizeable cash from operations. Similarly, in case C, although working capital is released with lower level of operations, the losses are too high and hence the cash deficit from operations. As can be observed, both higher W/C requirement and losses result in cash deficit from operations.

11.7 LONG-TERM CONTRIBUTION TOWARDS W/C OR (NWC)

While the working capital components are short-term in nature, it is a sensible to have some funds from long-term sources invested in working capital, which offers a cushion to the working capital management and liquidity of the business. This is also known as Net Working Capital (NWC). As we will discuss later, in credit-based businesses NWC has an important role to play in reducing the working capital risks.

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NWC is required mainly because of two reasons:

- a. To maintain business at a minimum level, a certain level of minimum current assets (such as minimum inventory) is required. It is better to fund this part from long-term sources with no link to current liability, as it will obviate any external creditor pressing for immediate payments.
- b. Secondly, financing all current assets from current liabilities carries a risk. In case some of the current assets do not convert into cash on time, the business may face difficulties in settling corresponding current liabilities. A liquidity crisis looms large, which could be avoided if a part of the current assets is funded by NWC.

The more the NWC, the better the liquidity of the business. But deploying funds in working capital is not that attractive, from the profitability point of view, if the requirements can be met through credit. Higher credit in the working capital lowers NWC, which will enhance the RoI ratios, but at a cost—the resultant liquidity risk tends to be high. This is evident from the following simple example:

Example 11.4

ABC Ltd has offers from two suppliers (a) XY Co. quotes 60M on cash-on-delivery basis while (b) PQ Co. quotes 60M and offers three months' credit for 90% of the amount with 10% payment on delivery. ABC Ltd is confident of selling the goods for a net profit of 5% or 3M. However, given the competition in the market, ABC Ltd should extend four months' credit to its clients. Which one requires more NWC and what are the working capital risks involved in the two offers?

Solution:

First Offer: RoI for four months would be 5%, (3M/60M) as the entire amount is contributed from owners' funds. RoI on annualised basis, would be 15% because the working capital cycle is four months. Although there are no creditors around to press for payments, the profitability is low (compared to the other offer). In this case the NWC is 60M, fully funded by the owners/shareholders' equity with nil external liabilities.

Second offer: RoI would be 50% (3M/6M) and annualised RoI would amount to 150%. The trick lies in the minimum own investment by ABC Ltd. Here the NWC is just 6M (10% of 60M) with the balance (54M) from trade credit. However, it carries certain risks—while the supplier should be settled in three months, the payment from debtors

is realizable only after four months. In other words, the second option carries high liquidity risk.

11.8 WORKING CAPITAL RATIOS

Since working capital management is a complex affair, in most businesses the creditors would like to find out the efficiency of W/C management. Financial ratios provide superb help in this. The usual ratios used to study W/C management of a business are:

WC to Total Assets		Links to the total asset base.
WC to Sales	—	Links to the business activity.
Stock Turnover Ratio	—	Shows the stocking requirement.
Debtors' Collection Ratio	—	Shows the credit period extended to customers.
Creditors' Payment Period		Shows the credit period availed from suppliers.

Please refer to the Financial Analysis section for details on these ratios. Now let us see some examples to understand how these ratios bring out the working capital efficiency.

Example 11.5

Following are the figures extracted from a retailer's (supermarket) balance sheet. Discuss the overall quality of working capital management.

			(Rs. in 000s)
Particulars	1999	2000	2001
Sales	25,135	24,046	23,765
Cost of Sales	19,122	17,663	17,790
Stock	3,286	2,885	2,796
Trade Debtors	236	157	195
Trade Creditors	2,545	2,513	2,529
Working Capital Finance	Nil	Nil	Nil

Answer:

Calculation of Working Capital Management Ratios

Working Capital (in 000s)	977	529	460
Stock Holding Period (days)	63	60	57

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Debtors' Collection Period (days)	3	2	3
Creditors' Collection Period (days)	49	52	52
W/C to Sales	3.9%	3.1%	2%

Comments: As the retailer mostly sells on cash basis, the debtors are almost nil, which is reflected in the low average debtors' collection period. It has only very few credit customers, probably some large customers who regularly buy from the supermarket, and hence the credit. Debtors' policy has remained the same for the last three years as evident from the relatively steady collection period. Stocking policy shows that the supermarket stocks goods for a two-month period. Stock policy also has not undergone any substantial change, although stock management appears to have improved as is evident from the six-day reduction compared to the previous years. At the same time the business appears to have negotiated better credit terms from the suppliers as is evident from the average payment period. Consequent upon the reduction in stock level and slightly higher trade credit, the W/C gap dropped by 53% to Rs. 460K over a three-year period, with a narrowing cash cycle of 8 days compared to 17 days two years ago. Overall, the quality of working capital management is satisfactory. The business is running without any reliance on working capital borrowings as almost the entire requirement is met from the trade credit.

Example 11.6

Following is the working capital information related to a manufacturing company balance sheet. Assess the quality of the working capital management:

			(Rs. in 000s)
Particulars	1999	2000	2001
Sales	459,861	481,753	514,128
Cost of Sales	310,152	324,694	342,391
Stock*	94,004	124,315	85,482
Net Trade Debtors	61,578	70,476	74,081
Trade Creditors	31,182	57,902	45,746
Working Capital Finance	65,125	72,136	55,642
Total Assets	327,227	415,192	432,992
* Stock: Raw material & Packing	55229	70974	43369
Stock: Work In Progress	1210	1480	730

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Stock: Spare Parts	7459	6806	6929
Stock: Finished Goods	31754	46149	35659
Less: Provision for Slow Moving	-1648	-1094	-1205
Answer:			
Calculation of Working Capita	al Management	Ratios	
Working Capital	116,941	130,083	106,888
Stock-Holding Period*	102	132	84
Debtors' Collection Period	49	53	53
Creditors' Payment Period	37	65	49
W/C to Sales	25%	27%	21%
W/C to Total Assets	36%	31%	25%
W/C to Bank Borrowings	56%	55%	52%
		* without spare-parts as	they are not stock-in-trac
Raw material & Packing Holding	65	80	46
Work In Progress Period	1	2	1
Stock: Finished Goods	37	52	38
Less: Provision for Slow Moving	-2	-1	-1

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Comments: Overall, W/C management is satisfactory. While stock (both RM and FG) increased in 2001, by 2002 they have been brought down. Moreover, there was a commensurate increase in the trade creditors as well in 2001, which part-funded the increase in stock. While bank borrowings also support working capital requirement, it is reasonable and amounts to around 55% of the working capital gap. The balance is funded mainly from long-term contribution from long-term sources or NWC. Note the relatively low WIP period, which reflects the relatively fast conversion time-from raw material to finished goods.

WORKING CAPITAL RISKS 11.9

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Whether trade credit or bank finance, the provider of working capital facilities is exposed to credit risk, which necessitates credit risk analysis to understand the risk being undertaken. However, the work capital, due to its uniqueness, has eight exclusive risks, which are discussed below:

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1. Overtrading

In this situation, difficulties emerge from the fact that the business entity tends to do business beyond its capacity. The entity expands the volume excessively in relation to the finance provided by the owners. The impact of expanding "too much too quickly" is that it will be impossible to generate funds from own operations quickly enough to meet the working capital demands of the business. Consequently, the firm relies on external finance heavily, either by overstretching creditors or by relying on higher bank borrowings. Given the fact that the creditors will not lend support beyond a certain limit and will be reluctant to assume risks involved in extending credit disproportionate to owners' funds, a liquidity crisis ensues.

As the firm focuses on volume growth there are other perils such as drag on margin and low quality debtors, which will further worsen the liquidity situation. Besides seeing its image tarnished, the business entity will struggle to settle bills, pay wages and other expenses. It will be forced to raise money from costlier sources, grant exorbitant discounts to debtors to speed up collection, suffer low inventory due to lack of creditors' support and increased purchase costs (loss of discounts), etc.

Financial statements reveal whether a firm is overtrading or drifting towards this malaise. In case the balance sheet variables such as stocks, debtors, creditors or short-term borrowings show sharp increase with dramatic increase in turnover usually without any increase in profitability, further investigation is called for. As the next step, examination of certain financial ratios such as OPM, Sales to OCE, CR, QR, W/C-Sales Ratio, Gearing, Leverage and Interest Rate Cover can indicate the stage of overtrading. Overtrading symptoms, can be cured easily at the initial stages, while at the later stages a thorough reorganization would be the only option.

2. Diversion Risk

Diversion risk refers to the use of working capital funds towards non-working-capital purposes. While all funds—long-term and short-term, profits or owners' funds or external liabilities—come first into the working capital pool, a clear distinction and an awareness of the nature of funds is a must and a hallmark of good financial management. All changes in working capital components and the cash movements in long-term items (such as long-term loans, sale/purchase of fixed assets, etc) are reflected in working capital. For

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instance, when a share issue is launched to finance an expansion, initially the moneys will be placed in a bank account, which is a current asset a working capital component. Thereafter it will be used to fund long-term assets such as fixed assets and technology.

Many firms confuse or ignore this distinction, and end up using the working capital funds for other purposes, resulting in diversion, which ultimately leads to liquidity crisis, defaulting on bank loans, stretching creditors with resultant costs, and ultimately bringing a bad name in business circles or even resulting in business collapse.

Diversion can occur in two ways: (a) Diversion to non-working-capital purposes within the business and (b) Diversion of the working capital funds out of the business. While the former is traceable to aggressive expansion or investment in non-core activities, the latter is a case of withdrawal of funds from business, either directly or indirectly. Indirect means of withdrawal include advances to related parties, accommodation with third parties, over-invoicing of the purchases, under-invoicing of the sales, etc.

The remedy lies in the awareness of the importance of cash to be deployed in the working capital to keep the business running. Long-term funding requirements should be met from long-term sources. Similarly, indiscriminate withdrawals should be avoided.

3. Inadequate Working Capital Management Skills

As we have seen earlier, working capital is dynamic and not fixed. The dynamism is traceable to the underlying activities such as purchase of materials and meeting related material-handling expenses, selling and associated costs, collection skills, buyer/supplier/ bank rapport, negotiation skills and stock management techniques. All these are part of working capital management. If the skills are lacking, it may antagonise the major customers, suppliers, bankers, government authorities, etc., whose actions can result in working capital problems.

4. Inflation Risk

As we have seen in Chapter 5, inflation is one of the potent external risks faced by firms. One of the areas it impacts is the working capital. The impact is more serious if inflationary pressures on expenses outpace the selling price, which is true for severely competitive businesses as rivals attempt to retain market. This inevitably impacts the

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cash flows. In such cases, the cash outflows increase with the higher costs, while cash inflows will not increase proportionately, thus impacting the working capital pool.

5. Inadequate Provisioning in Original Project Costs

Without necessary working capital, the entire investment in plant and machinery may come to naught. Working capital assumptions should reflect the market with contingencies. For instance, if the average credit period in the market is 'two months', at least for the initial one-year period, the working capital should be based on 'three months credit' assumption for the new project. There are cases of owners sticking to the original plan despite suggestions to be more liberal in working capital estimation and their contribution, only to face severe working capital shortages once the project goes on stream. As these projects have many shareholders, additional shareholder funding is delayed since it has to go through several legal and routine procedures of shareholder meetings, certain unanimous decisions, presentations to convince the shareholders, and so on. This results in delay in utilizing working capital lines by banks contingent upon shareholder support, which finally leads to the rescheduling of term loans as well. If sufficient working capital is provided in the original project cost, these hassles can be avoided.

6. Losses and Reducing Profitability

In the case of a loss-making entity, the working capital disappears in the net loss suffered by the entity. Profits are one of the key elements that ensure liquidity. This can be illustrated by a simple example: Let us suppose a firm buys on credit, goods worth \$10,000 and sells them for 25% profit. The resultant debt and credit of this transaction are \$12,500 and \$10,000 respectively. The liquidity ratio is 12,500 / 10,000 = 1.25:1 showing comfortable liquidity and hence minimum working capital risk, other things remaining the same. On the other hand, see what happens if the firm is forced to sell at 25% loss. Then the debtor's collectable would be just \$7,500 while the firm has to meet the liability of \$10,000.

Any drop in profitability, which can be captured by GPM, OPM and NPM (as discussed in Chapter 8) results in less internal cash generation, and in the event of waferthin margins or losses, external support becomes inevitable. While this is acceptable in the short-run, the long-run scenario demands reasonable profitability for proper working capital management. Evidently, lack of profitability in the long run can create havoc.

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7. Inadequate Structuring of Facilities by Banks

Many times banks/financiers are to share the blame for creating working capital problems and risks associated with them. One example can be the import loan extended by a bank assuming a working capital cycle of 120 days, while in reality the cycle is 190 days. While arriving at the working capital requirement of customers, banks need to factor in a lot of variables such as shipping time, lead time in the case of documentary credits, conversion cycle of raw material into finished goods, stocking period and credit terms to customers. Sound understanding of the customers' business by the lending/ credit executives in the bank is a must. The "Know Your Customer" principle should be strictly adhered to by banks and FIs. Any misunderstanding on any point can result in wrong structuring of facilities, causing difficulties to both parties.

8. Unforeseen Contingencies

Equipment breakdown, riots, floods, etc., cause unexpected expenses, absorbing working capital. For instance, let us suppose the major repairs to a key machinery item had to be done and the business utilized one month's collections from debtors and bank overdraft facility towards it. Unforeseen contingencies can deplete working capital or halt the proper movement of the working capital components.

11.10 IMPACT OF W/C RISKS

In all cases of working capital risks, liquidity is impacted as the size of the working capital pool and associated elements get impacted resulting in a critical situation—usually lack of sufficient resources. Payment of dues to employees, suppliers and other creditors, repayment of loan and all imaginable short-term liabilities become difficult, with associated costs and difficulties. Massive discounts to debtors for prompt collection, penal interest by banks on the overdues, threats of legal suits, defaults on due date, bad name in business circles are some of the outcomes not desired by any good businessman.

From the creditor's point of view, working capital risks enhance credit risk, given the insufficient liquidity to meet commitments on time. Hence, the best strategy for creditors is to avoid credit exposure to customers showing working capital risks unless they can be mitigated.

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A liquidity crisis chokes up working capital flows. It can result in non-replenishment of stock, harassing of debtors to pay up or displeasing creditors by inordinate delay in the settlement of dues. The solution lies in proper financial management, basically respecting the maturity law (viz. financing long-term needs with long-term sources).

Usually at the firm level, a lot of tricks and crisis management tactics are used to overcome liquidity problems. Credit executives must be aware of such measures adopted by the obligors, because such measures themselves act as some kind of warning signs. They include the following:

- Large discounts to the buyers.
- Selling on cash basis—not only finished goods, but a part of the raw materials as well.
- Sale and lease back of fixed assets.
- Rigorous collections.
- Selling debts to a factor.
- Making only essential purchases.
- Scramble for short-term funds.

11.11 RISK MITIGANTS

Following are seven important mitigants, which can avoid potential working capital risks:

1. Covenants

Working-capital-related covenants can ensure adequate working capital because the business will be compelled to ensure the presence of adequate current assets to support the current liabilities. Usual covenants relate to minimum current and/or quick ratio, profit retention ratio, minimum net worth, maximum capital expenditure (to avoid diversion), etc.

Proper implementation of covenants can mitigate W/C credit risk by ensuring the integrity and competence of the management. For instance, minimum current ratio covenant of 2:1 ensures double level of current assets vs. current liabilities (adequate current assets to meet current liabilities) or CAPEX covenant, restricting investments in projects/capital assets (prevents/mitigates diversion risk) or imposing dividend restrictions such as maximum dividends not to exceed X% of the profit for the year (ensures prudent management by ploughing back of profits into business) and so on.

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2. Cancellation/Tightening/Temporary Freeze of Facilities

W/C risk can be avoided fully by denying or cancelling the credit facilities involved. Accordingly, the manufacturer can refuse to deal except on cash basis or use similar mitigants such as LC/GTEE. Banks can similarly refuse credit unless fully secured by acceptable collateral. Or a temporary freezing may be done so that the obligor feels the pinch, which will improve the working-capital-related behaviour.

3. Increase Pricing

Both financial and non-financial businesses can use pricing policies effectively as a mitigant to manage the credit risks involved in the working capital facilities. If the 'risky' obligor still wants credit, he can have it at a higher price or seek an alternative supplier. However, it is to be noted that once credit is granted, the supplier is taking exposure to a relatively poor quality credit risk. It is always advisable to adopt a cautionary approach while using pricing as a mitigant.

4. Liquidation of Non-Core Assets

Under tight strains, working capital risks impact liquidity in a debilitating manner. One of the mitigants that can infuse liquidity is to find sources within the organization. All non-essential assets of the business can be liquidated so that additional liquidity is infused.

5. Owners' Injection/Strengthening NWC

If there are insufficient non-core assets to liquidate, then the only alternative left is to seek out funds from the owner to bolster the liquidity conditions. This has many positive sides compared to relying on further short-term borrowings such as: (a) There is no commitment of due dates and (b) It inspires confidence in creditors as they view this as the evidence of owners'/long-term financiers' support and interest in the business.

6. Improvement of Working Capital Management

Appointing good finance managers can make a big difference. While poor financial management can make a good situation bad, a capable financer manager can tide over even difficult working capital situations with ease, anticipating and planning cash flow

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movements considering seasonal variations or impact of external/industry risks, in a proactive manner. One of the hallmarks of good financial management is the understanding of the need for matching the asset/liability maturity patterns and having sufficient long-term sources at hand to invest long-term. Creditors—especially those having substantial credit exposures like banks and FIs—may make appropriate covenants (to ensure capable finance managers) in this regard.

7. Insuring for unforeseen contingencies

Most of the contingencies that suck liquidity can be covered by proper insurance coverage.

11.12 WORKING CAPITAL FINANCING

Banks and other short-term credit institutions are the major suppliers of working capital finances. Working capital financing constitutes a major part of the entire financial system of the world. Banks compute working capital financing in depth as they are in the business of credit "risk" taking, while suppliers extend credit as a corollary to their main business. Commercial banks and other financial institutions which play a major role in working capital financing have devised various forms of lending, which are described briefly below:

Overdroft: A facility whereby the customer can overdraw the current account up to an agreed limit. The customer can at any time, deposit money into the account to reduce the outstanding balance or he can draw out money whenever he needs it as long as he does not exceed the limit. But the management of the credit risk of the facility is relatively difficult for the lender, in view of the absolute lack of control over the end-use.

Short loans: This refers to the specified amount extended for a definite period of time. From the credit risk point of view, banks generally favour loans because: (a) Loans are easier to monitor and control than overdrafts and (b) Loans are granted for a specific purpose, and the repayment period and source of repayment are usually made known to the bank by the borrower at the time the facility is agreed upon.

Trade Finance: This refers to an entire spectrum of financing instruments developed by commercial bankers to fund and control trade/manufacturing business. A properly

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structured trade finance facility goes a long way in reducing the credit risk and is often preferred by banks over overdraft and loans. Letters of credit, bill finance, import and export finance are some of the major sub-categories under this category.

Asset Financing: Banks sometimes prefer to finance a particular item of the working capital. This ensures more control over the purpose of the facility extended, which translates into lowering of credit risk. The common forms of asset financing include factoring, forfeiting and similar categories, where the repayment of credit is linked to a particular asset. In India, working capital finance has been traditionally linked to current assets such as stock and debtors with prescribed margins, ranging between 20% and 30%. However, this has two serious drawbacks: (a) The focus on the current assets often results in the overlooking of overall financial standing and (b) The supplier credit can often be downplayed by the borrower. Ascertaining of the suppliers' claim on the stock lying in the premises of the customer, although not impossible, is fraught with difficulties.

ILLUSTRATION

The top management and creditors of APC Ltd are worried because of the poor performance in FY 20X2. The summarized financial statements of APC Ltd are given below.

Having understood that the year was going to be difficult, the top management had decided early in the year to skip dividends for the year. Moreover, the management

Summarized Balan	ce Sheets				
ASSETS	31.12.20X1	31.12.20X2	LIABILITIES	31 . 12 . 20 X 1	31.12.20 X 2
Net Fixed Assets	114,102	113,102	Paid-up Share Capita	al 70,000	70,000
Current Assets-Stock	x 24,751	20,773	Retained Earnings	8,485	1,080
Trade Debtors	9,734	6,768	Long-Term Loans	66,126	59,135
Cash & Bank	1,077	1,839	Current Liabilities— Trade Crs.	- 4,820	4,050
Other Current Assets	1,279	805	Short-Term Loans	1,556	4,164
Investments in a JV	5,000	5,000	Other Creditors	4,956	9,858
			Non-Current Credite	ors	
Total Assets	155,943	148,287	Total Liabilities	155,943	148,287

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SUMMARIZED PROFIT	& LOSS	ACCOUNTS	SUMMARIZED CASH FLOW	
Particulars	FY 20X1	FY 20X2	Details	FY 20X2
Sales	73,749	51,462	Operating Profit	(2, 843)
Less: Cost of Sales	(56, 946)	(47, 687)	Add: Non-Cash Expenses	10,125
Gross Profit	16,803	3,775	Chg. In Stock	3,978
Less: Admin Expenses	(6, 384)	(6, 618)	Chg. In Drs	2,966
Operating Profit	10,419	(2, 843)	Chg. In Crs	(770)
Less: Interest	(2, 307)	(4, 562)	Chg. In Other CA/CL	5,376
РВТ	8,112	(7, 405)	Net Operating Cash Flows	18,832
Less : Tax			Less: Dividends	
PAT	8,112	(7, 405)	Less: Interest & Tax	(4, 562)
Reconciliation of Profits			Net Investing Cash Flows- Fixed Assets	(9, 125)
Opening Retained Profits	2,344	8,485	Net Inflow from Other Items	
Less: Dividends, etc	1,971		Net Financing Cash Flows	(4, 383)
Closing Retained Profits	8,485	1,080	Net Chg. in Cash/Liquid Funds	762
Other Information :				
Depreciation/Non-Cash Exp.	NA	10,125		

was careful to continue the same working capital policy and retained the same trade terms with suppliers and customers and maintained the same stock policy. Still, some of management team is surprised to see tight cash flows with higher reliance on banks despite lower volume, with current and quick ratios halving compared to the previous year. Could you explain the reasons for increased borrowings and drop in the ratios?

Secondly, the creditors of the company are worried about the losses. Please bring out the major credits risks, if any, in working capital management. Also identify and suggest risk mitigants.

Solution

a) Movements in Working Capital Pool and Relevant Ratios

W/C POOL MOVEMENTS RATIO ANALYSIS PROFITABILITY RATIOS				
Particulars	FY 20X2	Details 31.12.20X1 31		31.12.20 X 2
		GPM	22.8%	7.3%
Opening W/C	25,988	OPM	14.1%	-5.5%
Add : Net Profit	(7, 405)	Working Capital Ratios		
: Depreciation/Non-Cash	10,125	Working Capital	$25,\!988$	14,438
Less: Dividends		Stock Holding Period	159	158
Net Pool	28,708	Debtors' Collection Period	48	48
Change in Fixed Assets	(9, 125)	Creditors' Payment Period	31	32
Change in Term Loans	(6,991)	W/C to Sales	35%	28%
Change in Bank Loans	2,608	W/C to Total Assets	17%	10%

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Change in Cash & Bank	(762)	Liquidity Ratios		
Closing Working Capital	14,438	CR	3.25	1.67
		QR	1.07	0.52
		Capital Structure Ratios		
		Debt to Equity Ratio	0.99	1.09
		Gearing	0.86	0.89
•				

b) Interpretation:

As is evident, the turnover ratios remained the same, evidencing the similar working capital policies. But the inflows into the working capital pool dried up because of the net loss of SAR 7.4M. The cash profit (after accounting for the non-cash charge of depreciation) stood at SAR 2.7M. Given the inadequate cash generation for the year, the repayment commitments and routine CAPEX were funded by squeezing working capital, and also by an increase in 'other creditors' component (usually accrued salaries, etc reflecting delayed salaries, etc). It appears that a part of the bank borrowings were also channelled to meet the repayment/CAPEX needs.

c) Overall the working capital risks are:

- a. Diversion of working capital.
- b. Inadequate W/C management. Further squeeze in working capital should be curtailed.
- c. Poor profitability.
- d. NWC shrinkage (NWC dropped to 17 M from 36 M in the previous year).
- e. Increasing leverage.
- f. Short-term borrowings were utilized to meet long-term requirements, which had in fact caused the drop in the current and quick ratios along with the loss- es and increase in other creditors.

d) Mitigants are:

Provided positive steps have been initiated to bring the business back into profitability, the situation has the following mitigants:

- a. Despite the increase, the leverage is still moderate.
- b. Non-core investments can be liquidated. A charge over the non-core and unencumbered assets of the company may be taken.
- c. Current/quick ratio covenants and D/E or TNW covenants may be introduced.
- d. More long-term sources (injection of equity/long-term loans) may be stipulated to enhance NWC.

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Credit Portfolio Risks

PART FOUR



Introduction to Credit Portfolio Risks

The modern day credit executive—banker, finance manager, financier, among others cannot do justice to his profession unless he understands portfolio credit risks. Ignoring portfolio credit risks can have a catastrophic impact, even resulting in bankruptcies. Failure of many banks across the world and that of non-financial enterprises, to a great extent, can be traced to poor credit portfolios. Credit portfolio is critical to all business enterprises having sizeable credit exposures. Most modern day business cannot exist without a credit portfolio. Proper understanding of credit portfolio risk is a key success factor in enterprises with significant credit assets. Usually financial institutions like banks, non-banking finance companies, project lenders, multi-nationals, regional majors and many medium-sized companies have huge credit portfolios, comprising thousands of customers.

Banks create credit assets by lending or purchasing of bonds and other fixed income securities. Manufacturing and trading enterprises create credit assets through credit sales. Different terminologies are made use of, primarily out of custom in the respective business practice, to represent credit assets. Debtors/receivables/obligors/advances/ borrowers/loans/bonds/debentures are among the expressions commonly used as a substitute for the term 'credit asset'. Credit portfolio is a bunch of such credit assets with separate risk characteristics distinct from individual components.

12.1 CRITICALITY OF PORTFOLIO CREDIT RISKS

While the behaviour of credit risk at firm level is vital, it is equally important to look at it from a portfolio perspective. We have examined the individual firm credit risk and its components under the EIIF model in detail and seen how to evaluate them. Now it is time to focus on portfolio risks. While firm-level credit risk analysis focuses

on micro-credit risk or obligor level, credit portfolio risk analysis focuses on the macrocredit risks or studies the credit risk behaviour of a group of obligors/credit assets.

Portfolio credit risks can no longer be ignored, wherever the credit plays an important role. The portfolio approach to credit risk is one of the central themes of the Basel Accord, which took shape in 1988 and is undergoing serious changes currently. The emphasis of the Basel Accord on credit portfolio is discussed in the next chapter. Portfolio credit problems are critical due to the following four aspects:

1. Portfolio Management Issues

A credit portfolio cannot be managed efficiently unless the underlying portfolio credit risks are known. Portfolio management requires detailed knowledge not only of firm credit risk exposures, but also portfolio-specific risks. The portfolio perspective allows the credit to be viewed from the standpoint of pooled risk. The opportunity to take on a slightly greater risk at 'firm' level becomes acceptable if the 'portfolio' risk (viz. overall risk pool) stays within an acceptable tolerance level. As the need to capture more markets in the face of increasing competition continues, the portfolio perspective is likely to attain even more importance in the future.

2. Concentrations and Correlations

Awareness of portfolio risks is a must to identify, monitor and control risk concentrations and correlations, on an ongoing basis. Periodical review of the credit portfolio is to be undertaken to consider portfolio issues such as:

- Growth or contraction in credit portfolio size
- Industry concentrations
- Credit-grade portfolio movements
- Adequacy of provisions
- Derivative exposures
- Other related or current credit issues.

3. Credit Quality Dilemma

To monitor the credit quality of the loan portfolio, knowledge of portfolio risks is a must. It requires awareness of certain specialized industry exposures with higher risks, which

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should be managed carefully through the imposition of exposure caps. Similarly, centres of expertise in credit/lending to specialized industries can be established pursuant to a portfolio approach in credit risk analysis. Where necessary, it is necessary to establish caps or manage down concentrations which are considered to be excessive. It also includes the identification and tackling of potential vulnerabilities in the portfolio. Sound understanding of credit portfolio risks is indispensable to carry out these tasks aimed at maintaining maximum credit quality.

4. Diversification Issues

All modern businesses with sizable credit portfolio desire to achieve optimum diversification. As we will see later, diversification does not mean simply increasing the number of customers/obligors in the portfolio. Advanced diversification is a scientific function of identifying various credit asset correlations and minimizing the overall portfolio risk through methodical diversification. In-depth knowledge of portfolio credit risks is a pre-requisite for the creation of an optimum diversified portfolio.

12.2 BENEFITS OF PORTFOLIO CREDIT RISK STUDY

The benefits accruing from the study and examination of credit assets from the portfolio angle are being widely recognized now. Consequently, many enterprises, especially financial institutions, are increasingly measuring and managing the risk from credit exposures at the portfolio level, in addition to the firm level. Following are the eight most important benefits:

1. Reduces Overall Credit Risk

The aggregation of all firm credit risks in a portfolio does not equal the portfolio risk. In fact, proper management can reduce the portfolio risk below the total or average of firm credit risks! While the EIIF model looks at individual credit, increasing global/regional pressures, including competition, among other factors demands a broader view of credit risk, resulting in the portfolio approach. Unlike firm-level credit risks, the portfolio credit risk is impacted by certain other factors such as distribution of the credit exposures among industry, region, etc. The fundamental concept is roughly explained by the following example:

Example 12.1

A financial institution (or a large multi-product manufacturing company) has a portfolio of 100 credit customers enjoying short-term credit facilities. After strict EIIF model assessment, the firm credit risk of all 100 obligors/customers is graded as 'Medium'. What would be the portfolio credit risk in the following scenarios?

- a. All concentrated in the same region/locality.
- b. All from same cyclical industry.
- c. The portfolio is equally distributed between two different regions or countries separated by 2,500 km distance.
- d. The portfolio is equally distributed among three different industry segments that are not related to one another.
- e. The portfolio is equally distributed among different ten different regions or countries and ten unrelated industries.

Explanation:

Although 100 customers are of acceptable firm credit risk, from a portfolio credit risk perspective the scenarios (a) and (b) imply higher portfolio credit risk with (e) being least risky. The other two cases lie in between. The distribution, composition and dispersion of the portfolio components have significantly different ramifications as evident from the dissimilar portfolio credit risks under the different circumstances mentioned above. Covariance or correlation of firm credit risks has a significant impact at portfolio level, which is one of the key topics in credit risk study at the portfolio level. A clear idea about the aggregate behaviour of varying categories of credit risk and their overall impact on the portfolio is critical. We will examine them in detail later.

2. Facilitates Active Credit Portfolio Management

Credit assets are now-a-days amenable to pro-active management. Instead of holding the credit assets till maturity, they can be offloaded or sold during the intermediate period. While syndicated loans can be sold to other participants or a newcomer, increasing availability of credit derivatives and securitization are opening new doors for active credit portfolio management. To take advantage of such opportunities the management should identify answers to the questions such as: (a) What is the portfolio risk—before and after the intended transaction? (b) How does the change in portfolio mix impact the risk level? (c) In the changing environment, which credit assets are to be bought and sold? These

and similar portfolio-level decisions pre-suppose sound understanding of portfolio risk factors. Non-recourse factoring is an example of active management of debtors' portfolio in non-financial companies.

3. Enables Maturity Matching

It is quite normal that the due dates of different credit assets fall on dissimilar dates. Usually there are liabilities against the credit assets—whether the business is financial or non-financial in nature. Matching of the credit assets and liabilities is usually critical in most businesses, especially in the financial sector. Proper asset/liability management requires a thorough understanding of credit risks—at portfolio level.

4. Optimizes Liquidity

Take the balance sheet of any medium/large business entity. A sizeable debtors' portfolio is a usual feature in most balance sheets. Liquidation of the receivables/debtors' portfolio is a major source of cash flows to meet various commitments including loan repayments, settling creditors and salary disbursements. Better liquidity is ensured by proper handling of credit portfolio, which calls for the understanding of portfolio credit risks. In fact this is a corollary to the point 3 above, and once maturities are fixed, by matching the inflows with outflows, liquidity crisis can be avoided. This is critical if the credit assets are leveraged—viz. created with a significant amount of external obligations. For instance, banks rely on deposits from the public to create credit assets, while non-financial institutions depend on bank credit or public capital debt (such as debentures, commercial paper and bonds). It results in an inevitable link between solvency, and maturity profile and quality of credit assets. The study of portfolio credit risks for assessing the liquidity of an enterprise has become a necessity rather than an option.

5. Helps Sales and Marketing

The credit department, through portfolio analysis, can help Sales and Marketing understand where the best opportunities may exist to make the business grow. Constant measuring and monitoring of portfolio risk not only ensures that the aggregate risk is managed within an acceptable range, ensuring adequate reserve levels, but influences

portfolio composition/business development decisions as well. For example, if the Sales group targets a 25% growth in a particular segment of the current customer base, the portfolio manager can furnish valuable information on how the resulting credit exposure can be achieved with minimal increase in portfolio risk.

6. Gives Insights into Sectoral/Industrial Risk Exposures

Different sectors and industries in an economy display dissimilar behaviour patterns due to a wide range of factors. As we have discussed in Chapters 5 & 6, business cycles and other external risks can impact various industries while industry issues affect the individual participants within it. A large number of obligors in a portfolio is of no consolation if the portfolio bears overexposure to a shaky industry. It is too risky, as the obligors will definitely be impacted by the downturn in that industry, which would turn satisfactory firm credit risks into unsatisfactory ones within a short span of time, impacting the portfolio.

It is well accepted that the overall credit risk changes with the evolving changes in the macro-economy. Hence, the credit portfolio risk should be understood in the context of possible impact on the various portfolio components in the face of changes such as cyclical upturns and downturns, political risks, interest rate movements, tariff changes, global developments and foreign exchange fluctuations.

These factors and prior bad debt experience will help the portfolio managers to identify vulnerable sectors and accordingly, certain industrial and economic sectors of the portfolio may be designated as high-risk. In such instances, it is necessary to establish separate policies and procedures to limit/restrict the extent of the portfolio exposures. At portfolio level, the sectoral and industrial risks are diversifiable, as we will see in Chapter 14.

7. Solving the Capital Dilemma

It is now being accepted that the quantum of the capital should be linked to the risks undertaken. Undertaking good quality credit assets with adequate returns can ensure lower shareholder capital and satisfactory returns (to shareholders). Accordingly, if higher credit risks are pursued, a higher capital cushion is called for. This is especially true for banks and financial intermediaries, who are active in credit markets. Capital is relevant from the risk management perspective. Since it is a measure of owners' funds at risk in

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the business, it is expected to provide incentive towards good governance as well. Accordingly, higher credit risks will not be undertaken without corresponding shareholder contribution. Calculation of 'risk-based capital requirement' is done in two ways:

- a. *Regulatory Capital*: The central banks all over the world welcome more capital in banks' capital structure and have prescribed minimum requirement in this respect, which is commonly known as Capital Adequacy Ratio/Regulatory Capital under the Basel Accord. The minimum level of regulatory capital is stipulated at 8% of the credit portfolio. We will discuss more about it in the next chapter. To put it briefly, regulatory capital aims at ensuring that adequate resources are available to absorb the losses. Higher the credit risk of the credit portfolio, higher the capital required. Accordingly, a financial intermediary coming under some kind of capital regulatory requirement should reduce the proportion of high risk credit exposures in the portfolio if it does not wish to maintain a higher level of capital.
- b. *Economic Capital*: Economic capital is decided by each bank's (organization's) own internal plans. The calculation of economic capital is believed to be more scientific than regulatory capital and has evolved to keep up with new activities such as derivative trading. It is usually calculated by statistical methods and is based on historical experience. Given its complexity, economic capital is usually computed by only by sophisticated financial institutions which are able to deploy resources towards advanced techniques.

A doubt may arise as to which capital is to be selected in the context of credit risks. Purportedly, both regulatory and economic capital have evolved from financial institutions' risks. Hence, ideally, the two kinds of capital ought to be equal. Indeed, financial institutions are lobbying hard to convince regulators to adopt new rules to bring regulatory capital more in line with the financial institutions' economic capital. Nonfinancial-sector enterprises have also begun to adopt the economic capital concept.

8. Helps in Devising Portfolio Management Strategies

Credit portfolio, as we have seen, is a bunch of credit assets of different risk grades, belonging to different regions or countries and probably scattered among different industry/economic sectors. Against the backdrop of macro-economic environment and capital constraints, the portfolio manager should draw up portfolio strategies to ensure that the portfolio risk does not spiral out of control, come what may. Such strategies will

provide preparedness to face all uncertainties through the construction of a balanced portfolio. This includes the study of the impact on portfolio credit risks due to changes in the portfolio mix, in response to external stimuli. Without a portfolio approach it is difficult to control overall risk in today's world. No wonder many institutions in the financial sector now prefer the portfolio approach to manage the credit risk rather than the traditional transaction (discrete deal) approach.

12.3 CREDIT PORTFOLIO Vs EQUITY PORTFOLIO

Most of the portfolio management techniques were evolved in the equity arena and then adapted by other areas like commodities, foreign exchange and credit markets. Portfolio management techniques like Portfolio Theorem, Swaps and Options are some of the prominent examples. Large financial institutions, especially in the West, are devoting considerable resources to developing new credit models. With advances in technology, the efforts of many brilliant researchers in large financial institutions, and the accumulation of significant bodies of knowledge on credit experience and analysis, credit portfolio management tools are likely to get more sophisticated in the years to come.

Since portfolio techniques are mostly originated in the context of equity, it is better to make the distinction between equity portfolio and credit portfolio and then proceed. The major similarities are that: (a) Credit and equity are two popular forms of capital (b) Both portfolios are impacted by both systematic and unsystematic risks. The major differences are: (a) Divergent risk/reward pattern. While the return (interest, commission charges, etc.) on a credit portfolio is fixed, in the case of equity portfolio it is uncertain as it depends upon the sufficiency of profits after satisfying all claims. But on its flip side, the equity can participate in the entire profits after meeting other obligations. Hence, the probability of substantial returns exists in equity portfolio, which is not the case with credit. (b) Credit enjoys a prior claim on the assets of the business. In the case of secured credit, the priority increases and enjoys higher ranking as far as repayment of principal and interest is concerned. However, the equity holders will get their principal back only after all creditors are satisfied, i.e., lowest ranking in the event of liquidation of the business.

12.4 CREDIT PORTFOLIO RISK Vs RETURN

Nobody extends credit for charity. All business enterprises undertake credit risk with a desire to earn a return. What is more important—to aim at enhancing return or reducing credit risks at portfolio level?

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In fact, in most cases the latter is the prudent decision in the context of credit risk. Credit portfolio risk management should give priority to the reduction of risk and then seek higher return. While return is important it should be noted that the upside potential of a traditional credit asset is limited. Although the traded credit assets such as bonds can have capital appreciation (as well as depreciation), usually it is much lower than that offered by equity markets. Hence, simply pursuing higher return is meaningless as it will lead to inadvertent shouldering of equity risks without matching benefits.

However, there is one situation where higher credit risks can be sought. Having pushed the portfolio credit risk below the targeted levels, it is acceptable if higher risks are sought in the quest for improved returns. One of the unique advantages of the portfolio approach is the ability to identify where the potential of enhanced returns lies. For instance, business enterprises with well defined portfolios having detailed sub-portfolio classifications (such as industry and region), find it easy to identify sub-portfolios which provide the best credit returns. The portfolio managers, in turn, can devise strategies to realize the full potential of each sub-portfolio. We will see more on sub-portfolios, later in this chapter under 'Portfolio Representation'.

While the portfolio approach definitely has a favourable impact on profitability, it is safe for the credit portfolio managers to set the minimization of portfolio risks as the primary goal of studying credit portfolio risks. It can be argued that the maximization of credit returns deserves only a secondary role. One essential fact to be always remembered in credit is that a safe rupee is much better than a risky rupee.

12.5 PORTFOLIO REPRESENTATION

To undertake proper portfolio credit risk analysis, the portfolio representation in analytical format is of paramount importance. Usually the portfolios of banks and financial institutions, large multi-nationals and big companies like Tata, have thousands of customers. For proper portfolio management of credit risk it is essential that the aggregate portfolio is divided into sub-portfolios. Within the portfolio each customer category represents a different level of risk and opportunity.

A *sub-portfolio* consists of credit assets with common characteristics such as similar size/ industry/geographic location and so on, but may have different credit grades or probabilities of default (PD, discussed in detail in the next chapter). Whatever sub-portfolios are generated, credit risk grades may be superimposed on them to reflect the credit risk

of individual sub-portfolios. Accordingly, the portfolio representation might be done in such a manner that a *homogenous cell* further groups the exposures in a sub-portfolio having same credit risk grade. An example of sub-portfolio matrix is as follows:

Particulars	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Total
Govt	32							32
Banks & Fis	56							56
Farming/Agriculture			6	19	1	3	3	32
Manufacturing	22	44	202	97	54	12	8	440
Mining			6					6
Electricity		17	19	10				46
Hotels		19	21	22	5	2		69
Traders	10	105	250	40	15	11	15	446
Transportation		6	25	10	5	3	3	51
Food	7	35	80	40	5	4	2	172
Building/Const.		11	102	118	100	44	4	379
Pharmaceuticals		10	52	32	22	5	11	130
TOTAL	127	247	761	388	207	84	46	1859

Example 12.2

 Table 12.1 Sub-portfolio based on Economic Sector & Credit Risk (Grade).

The highlighted cell in Table 12.1 is a homogenous cell, which shows the largest concentration of credit is with traders and with credit grade 3. It accounts for more than 50% of the total traders' exposure. The homogenous cell of Building/Const is the largest among credit grade 4, which is a matter of concern. The sector risk is on the higher side as Grade 4 and below grades account for about 40% of the total sector exposure. Electricity and Mining sectors are strong with almost all credit grades below 3. While exposure to Govt and Banks enjoy the safest rating, the profitability from the credit exposure need not be high compared to other sectors. A sub-portfolio of 'Economic Sector and Profitability' may be prepared for necessary answers. The beauty is that the sub-portfolio triggers questioning and provides a broader view of the portfolio

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components. (The reader may think about more possible angles of deriving insight and information from the above table.)

Another method of portfolio representation is to take the size of exposure into account. A sample sub-portfolio based on exposures and credit grades is given below:

Particulars	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Total
0-1 M	х	x	x	х	x	x	х	XXX
1 M-10 M	х	х	х	х	х	х	х	xxx
10 M-20 M	х	х	х	х	х	х	х	xxx
20 M-30 M	х	х	х	х	х	х	х	xxx
30 M-40 M	х	х	х	х	х	х	х	xxx
40 M-50 M	х	х	х	х	х	х	х	xxx
50 M-60 M	х	х	х	х	х	х	х	xxx
60 M-70 M	х	х	х	х	х	х	х	xxx
70 M-80 M	х	х	х	х	х	х	х	xxx
80 M-90 M	х	х	х	х	х	х	х	xxx
90 M-100 M	х	х	х	х	х	х	х	xxx
100 M & Abv.	х	х	х	х	х	х	х	xxx
TOTAL	XXX	XXX						

Example 12.3

 Table 12.2 Sub-portfolio based on Exposures & Credit Risk (Grades).

The matrix in Table 12.2 is constructed so that rows correspond to loans of a particular rating, and columns correspond to loans in particular exposure buckets (i.e. loans between 1-10M, 10M-20M, etc.) with an exposure range assigned to each column.

In this manner, the entire portfolio can be segmented into sub-portfolios, by using appropriate criteria, as required. Some of the possible criterian are: (a) Region/ Country (b) Salesmen or Relationship or Account Officers/Managers (c) Departments (d) Profitability (e) Credit Losses/Bad debts/Provisioning, etc. Fragmenting the total

portfolio into various sub-portfolios and homogenous cells can be based on any logical criteria.

The advantage is that it not only easily displays the portfolio structure but it enables further portfolio manipulations and calculations. Credit risk migration tendencies, default/recovery patterns, impact of changing environment on the sub-portfolios and return on the sub-portfolios are some of the crucial areas which provide valuable insights to the portfolio managers to decide on appropriate strategies to enhance return or reduce risk, or achieve both, at the portfolio level. It highlights dissimilar risk behaviour tendencies among various sub-portfolios, and performance, among other things. It also facilitates strategic decision-taking by bringing out the potential areas within the portfolio to further business development and improve profitability.



Credit Risk and Basel Accords

Consider this: The Top Notch Bank Ltd (TNBL), has an unsecured credit portfolio of 1,000 customers with a total outstanding of Rs. 1,500 crore, scattered across different regions and industries. All customers have been selected after being subjected to severe EIIF tests. What could be the maximum potential credit loss? The entire portfolio. A probability does exists, that the entire portfolio of Rs. 1,500 crore can be wiped out. In such a case, if the bank has to remain solvent, how much capital is required? The answer is Rs. 1,500 crore.

But in real life, the chances of the entire portfolio disappearing are very remote, given the stringent credit asset selection. Historical experience has shown that a prudently run bank with a capital adequacy of not less than 8% can remain solvent. Hence, the capital required for Top Notch Bank is Rs. 120 Crore, being 8% of the credit portfolio exposure.

Credit risk is the most important risk of all risks faced by banks/FIs. All banks have their own methods and practices, ranging from traditional to sophisticated techniques to rein in credit risk. But the risk management practices are so varied that some manage credit risk prudently while others fail to do so. As we have seen in the Chapter 1, credit risk is critical for the smooth functioning of the economies of the world. And the Basel Accords help the banks in managing credit risk as well, among others.

13.1 BASEL COMMITTEE

The Basel Committee is a committee of central banks or rather representatives from central banks of leading nations in the world such as USA, UK, France, Japan, etc.

Usually, the committee meets every three months at Basel (in Switzerland), where the main office of the Bank for International Settlements (BIS) is located. BIS is a bank owned by and serving central banks in the world to manage international settlements. For instance, recently in 2004 when Libya agreed to accept responsibility for the Lockerheed Bombing and agreed to pay a compensation of \$2.7 billion, the money was transferred to BIS, initially. However, it is to be noted that BIS itself does not participate in the policy deliberations of the Basel Committee. The decisions of the Committee are developed after extensive consultations with the banking/FI industry, mainly at national levels. Basel Accords are aimed at providing and promoting sound business and supervisory practices, by focusing on risk management.

When the first accord was designed in 1988 and implemented in 1992, the focus was solely on credit risk. This continues to be the most significant risk in the new Accord drawn up. Let us see how credit risks are considered under the Current (1988) Accord and New Accord.

13.2 1988 BASEL ACCORD

In the case of banks, traditionally, they have more leverage and the capital represents a small fraction of their assets: Such leverage levels are considered unacceptable for non-finance institutions. The high leverage level of banks is one of the main reasons why banking is among the most regulated industries, the world over. The 1988 Accord stipulates a minimum of 8% of capital to support the value of the risk-weighted assets of a bank. The prescribed formula is as given below:

Capital: While Tier 1 capital consists of paid-up share capital and disclosed reserves, Tier 2 capital comprises undisclosed reserves, asset revaluation reserves, hybrid capital instruments (such as mandatory convertible debt,) and subordinated debt, among others. Also, the Tier I capital should be at least 50% of the total capital.

Risk-Weighted Assets: Assets in the balance sheet of a bank have been differentiated, based on the risks. While central government/central bank obligations carry nil (0%) risk, those of the private business sector carry full risk (100%). This distinction,

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depending upon counter parties, gives a unique perspective to the capital adequacy of a banking institution. If a bank has more counter parties having nil (or lower) risk, it needs to hold less capital than a bank which has counter parties with 100% risk weight.

Risk Weight>	0%	20%	50%	100%
Counter Parties				
Central Govt, Central Bank exposure in National Currency	Х			
OECD Govt/Central Banks & claims guaranteed by them	Х			
Multi-lateral development banks (ADB, IBRD, etc)		Х		
Banks in OECD/Claims guaranteed by them		Х		
Residential mortgage- backed loans			Х	
Private sector entities				Х

The summarized weight scale is given below:

Table 13.1 Risk Weights of On-B/S items.

Another important aspect of the 1988 Accord is that it recognized the credit risks involved in the off-balance sheet items, which are converted based on the appropriate conversion factor, extending from 0% to 100%. The summarized risk weight scale is as follows:

Risk Weight>	0%	20%	50%	100%
Transaction Related Contingencies (Bid Bond, etc)			Х	
Direct Credit Substitutes— General GTEE of indebtedness				Х
Letters of Credit, collateralized by underlying shipments		Х		
Certain Commitments that are cancelable unconditionally	Х			

Table 13.2 Risk Weights of Off-B/S items.

13.3 BASEL 2 (NEW) ACCORD

While the Basel 1 (1988) accord was revolutionary and prescribed certain risk management tools and linked capital adequacy to risky assets, more than a decade has passed since its implementation. During this period, banking, risk management techniques, external challenges and financial markets have undergone significant transformation. The new accord is an improvement of the current approach and prescribes more options for risk weighting rather than a single measure, as used in Basel 1 approach.

Capital adequacy under new approach is as follows:

 $\frac{Tier1 (Core) + Tier2 (Supplementary) Capital}{Cr. Risk* + Market Risk + Operational Risk} = Capital Ratio (Minimum 8%)$

* In line with our topic, the discussion will be confined to the treatment of Credit Risk, which is the largest risk element in banks. Nonetheless, the readers may be interested to note that in broad terms while 'operational risk' is measured as a percentage of total income, the market risk is arrived at based on Value at Risk (Var) Concept. (The basic tenets of VAR are covered in Chapter 16).

Basel 2 Accord provides a choice to banks to adopt one of the two frameworks—viz. Standardized Approach or Internal Ratings Based Approach, which are discussed below:

a. Standardized Approach (SA) for Credit Risk

The SA is conceptually the same as the 1988 Accord, but is more risk-sensitive. The bank allocates a risk-weight to each of its assets and off-balance sheet positions and produces a sum of risk-weighted asset values. This approach uses external ratings for differentiating the corporate credit risks. Use of ratings by External Credit Assessment Institutions (ECAI) is not a perfect solution, however it does provide better differentiation of risks compared to Basel 1. Besides the external agency should satisfy six criteria—objectivity, disclosure, independence, access, resources and credibility. In other words, the external rating, provided by ECAI (such as CRISIL, MOODY, etc) that meets strict standards, decides the risk weights.

The rated counter parties receive weights ranging from 20% to 150%, depending upon the rating assigned by ECAI. However, the un-rated counter parties continue to receive 100% weight. Generally all AAA and AA rated companies require only 20% weight while credit exposures rated B and below require 150% weight. A snapshot of the latest weight structure is given:

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Credit Assets from	AAA/AA	Α	BBB	BB, B	Below B	Un-rated
Sovereigns	0%	20%	50%	100%	150%	100%
Banks@						
–Option 1*	20%	50%	100%	100%	150%	100%
–Option 2**	20%	50%	50%	100%	150%	100%
-Short Term Assets***	20%	20%	20%	50%	100%	20%
Corporate	20%	50%	100%	100%	150%	100%
Retail–Non Mortgage	NA	NA	NA	NA	NA	75%
Retail-Mortgage	NA	NA	NA	NA	NA	35%

Ratings by ECAI & Risk Weightage Allocation

* Risk weighting based on the risk weight of sovereign, in which the bank is incorporated, but one category less favourable.

** Risk weighting based on the external assessment of the individual bank.

*** Credit Assets with banks of a maturity less than three months can be given one category more favourable than the normal risk weight.

The capital requirement of an individual credit asset in the portfolio varies from 1.6% to 12%, depending upon the Risk Weighted Asset (RWA). This is evident from Table 13.3.

Less weighted (viz. less risky) credit asset require only less capital. Thus the banks are incentivized to include low-credit risk assets in the portfolio. In the event of higher risky credit assets being pursued, higher capital to be maintained due to the high risk weights given.

Particulars	Capital Adequacy	
20% Weight	1.6%*	
100% Weight	8%*	
150% Weight	12%*	
* RWA × 8% Capital Adequacy		

 Table 13.3 Risk Weights and Capital Adequacy under the proposed

 Standardized Approach.

b. Internal-Ratings-Based (IRB) Approach for Credit Risk

IRB allows banks to use their own internal estimates of risk to determine capital requirements, with the approval of their Supervisors (or Central Banks). Whilst SA is mandatory, a bank can choose IRB instead of SA, subject to supervisory approval of the bank's internal credit rating systems. IRB are of two types:

- a. IRB Foundation (IRB-F), where the banks are required to provide their own internal estimates of Probability of Default (PD) and use predetermined regulatory inputs for Loss Given Default (LGD), Exposure at Default (EAD) and a factor for maturity.
- b. IRB Advanced (IRB-A), where all inputs to risk weighted asset calculation—PD, LGD and EAD—estimated by the bank itself, subject to regulatory satisfaction.

As evident, IRB presupposes advanced and sophisticated risk management systems in the bank. The adoption of an IRB approach requires empirical data, the main components of which are as follows:

Probability of Default (PD) defined as the statistical percentage probability of a borrower defaulting within a one-year time horizon. PD is directly linked to the Customer Rating, based on the EIIF model, we discussed earlier. The PD can range from 0.00% for a zero risk customer to 100% for a very high-risk customer.

Loss Given Default (LGD) is the estimated amount of loss expected if a credit facility defaults, calculated as a percentage of the exposure at the date of default. The value depends on the collateral, if any and other factors that impact on the likely level of recovery. LGD estimates are to be based upon historical recovery rates and stress tested for economic downturns, among others. Whilst in IRB-F, LGD values are to be supplied by the supervisor, banks following IRB-A can assign their own LGD values, subject to the approval of the supervisors. (see Chapter 15 for more on LGD).

Exposure at Default (EAD) represents the expected level of usage of the facility when default occurs. This value does not take account of guarantees, collateral or security (i.e. ignores Credit Risk Mitigation Techniques with the exception of on-balance sheet netting where the effect of netting is included in EAD). Whilst EAD values are prescribed by Supervisors in IRB (F), in IRB (A), banks can assign their own EAD values—but the process of estimation should meet the minimum standards.

Under the IRB approach, a bank estimates each borrower's creditworthiness and the results are translated into estimates of a potential future loss amount, which form the basis
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of minimum capital requirements, subject to strict methodological and disclosure standards. Under both the foundation and advanced IRB approaches, the range of risk weights is far more diverse than in SA, resulting in greater risk sensitivity. If a bank can at least produce reliable PD empirically, then it can adopt IRB beginning with the Foundation Approach.

The expected credit loss from an exposure is the main driver for determining the credit rating in IRB. PD is based on the stand alone borrower risk rating (or customer rating), which can be determined through EIIF Model. LGD is dependent upon the collateral while EAD is the amount of credit extended. The three main elements of IRB-namely PD, LGD and EAD-are logically connected to determine the level of expected loss as evident from the following diagram:



Whilst the distinction between borrower risk and transaction risk is one of the prerequisites of Basel 2 compliance, all three elements should be viewed together to arrive at credit ratings. Interaction among PD, LGD and EAD is evident as illustrated in the following example:

Example

Suppose three customers, X Ltd, Y Ltd and Z Ltd approach a bank for a credit facility of \$100M. Based on EIIF Study, the bank assigns following borrower/customer rating to the three prospective customers:

Customer	Customer Rating
X Ltd	AA
Y Ltd	BB
Z Ltd	CC

Customer Rating of AA, BB and CC are assigned Probabilities of Default of 0.5%, 2% and 75% respectively. LGD assigned to facilities secured by real estate is 40% while fully cash secured facilities are assigned 0%. Whilst X Ltd does not offer any collateral, Y Ltd offers real estate as collateral while Z Ltd offers full cash security for the credit facilities. If the credit rating is assigned based on the expected credit loss, rank the customers.

Answer:

Ranking is as follows: Whilst the least risky credit will be the one extended to Z Ltd, followed by X Ltd and last would be Y Ltd. Following table summarizes the credit ratings:

Customer	Customer Rating	PD	Collateral	LGD	Exposure	Expected Cr Loss*
X Ltd	AA	0.50%	NIL	100%	\$100M	\$0.5M
Y Ltd	BB	2%	Real Estate	40%	\$100M	\$0.8M
Z Ltd	CC	75%	Fully Cash Secured	0%	\$100M	0

* PD x LGD x Exposure(EAD)

13.4 BASEL ACCORDS AND CREDIT PORTFOLIO

Basel Accords adopt a portfolio approach in determining credit risks and fixing capital needs. While the individual banks and FIs are free to accept the individual firm credit risks, at portfolio level the controls are imposed mainly in the form of risk weights. The crux of the matter lies in the fact that however acceptable the firm credit risks are, unless capital adequacy (linked to credit portfolio risks through risk weighting system) is maintained regulatory authorities are supposed to reprimand the respective banks and FIs. For instance, a bank may be facing a credit decision as to whom clean credit is to be sanctioned—to an AA customer with lower profitability or to a BBB customer with higher pricing opportunities. The standardized approach (under the New Accord) calls for 20% risk weight of the former and 100% for the latter. Several portfolio-level decisions are triggered by this. Impact on profitability, overall portfolio risk, and capital adequacy requirements are a few of them.

There is a **strong criticism** against the New Accord that it favours banks in developed (Western) world to the disadvantage of the rest of the world. Most of the banks in the Western world would opt for IRBA, which provides flexibility to bring the capital adequacy levels to a very low range, because the banks internally determine the credit ratings, which reflect on portfolio risk weights. Most of the banks in the developing countries are to follow the standardized approach, where the external ratings determine the weights. Hence, it is clear that those banks following IRBA enjoy the possibility of creating more credit assets on a lesser capital adequacy. Similarly, country ratings also impact the risk weights, which adversely affect countries without attractive ratings. The New Basel Accord is set to be implemented from 2007 onwards.

(More details on the Basel Accord/Basel Committee deliberations are available on their website.)



Fundamentals of Portfolio Risk

The earthquake in Kobe in 1995 was just another seismic activity in the earthquakeprone Japanese islands. Nobody would have thought at that time, it would send the 223-year-old Barings Bank, UK, into oblivion. It did. One of the reasons was the portfolio risk. Too much exposure to the Japan financial market along with other flaws, sent a once highly regarded bank, with \$900 million in capital, into liquidation with losses of around \$1 billion.

Understanding of portfolio risks is essential for proper management of credit risk. Risks at portfolio level are impacted both by the broader macro-economic environment and firm-specific factors. Credit portfolio risk is the total of several variables, as Fig. 14.1 shows.



Fig. 14.1 Credit Portfolio Risk Variables

14.1 SYSTEMATIC RISK

Systematic risk is a risk common to the economy or country as a whole, and cannot be eliminated by combining the assets in a large and well-diversified portfolio. Hence, it is also known as non-diversifiable risk.

Systematic risks originate in several forms, sizes and severity. While economic shocks and foreign exchange crises have created problems in the recent past in many nations, war or threat of political instability have contributed to risks in other countries. A look at the major economic crises during the last two decades is a good guide. Almost eight global/regional crises happened in 1992–2002, spanning Asia, Europe and the Americas. Economic history is replete with similar instances. Regional/global imbalances unleashing systematic risks can be traced back to the 1980s and prior decades.

As systematic risks worsen, it is the low-quality credit assets which collapse fast. A portfolio approach is essential to identify such specific and vulnerable sectors and credit asset categories which may face a catastrophic impact in different economic scenarios. This, in turn, will enable the portfolio to be balanced adequately so that the severity of differing macro-economic meltdowns (systematic risks) is reduced.

Most of the systematic risks are covered in Chapter 5 (External Risks). The significance of systematic risks may differ from industry to industry. While in the case of banks the important systematic risks include interest rate risk and foreign exchange risk, a manufacturer who operates only in the domestic market with nil gearing will not be explicitly impacted by the changes in these variables. Similarly, the changes in import policy will impact industries enjoying tariff protection against foreign competition or industries relying heavily on imports for raw materials and other inputs. Inflation risk impacts credit portfolio because it tends to redistribute funds (in real terms) from the creditor to the borrower. Suppose a creditor business extends goods costing Rs. 1,000 for 5% margin for six months' credit. If the inflation is 8%, the creditor loses money in real terms. After six months, the real value of the credit would be $1000 \times 105\% \times 92\% = \text{Rs}. 966/\text{-}$. This risk should be managed through credit pricing, which is discussed later. Systematic risks provide a broad view that enables portfolio managers to be warned about how the dynamic environment and various forces acting therein are likely to impact the credit portfolio/sub-portfolios.

In modern days, where economic upheavals are almost a common feature, determining exactly how the level of credit risk is impacted by the evolving state of the macroeconomy is a challenging task. Many countries have experienced a financial crisis after

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a period of strong economic growth, rapidly increasing asset prices and satisfactory economic statistics. The credit risk often appears low under boom conditions, but in reality, serious imbalances are building up. An in-depth awareness of systematic risks impacting credit portfolio risks provides useful information to design appropriate policies to protect and enhance the quality of the portfolio, ensuring adequate returns.

14.2 DIVERSIFIABLE RISK

Diversifiable risk is firm-specific and may be eliminated by holding credit assets in a large diversified credit portfolio. It is also known as non-sector risk, non-systematic risk or specific risk. Since diversification provides a relatively easy way of eliminating non-systematic risk, it is reasonable to argue that the only type of risk that should be rewarded in the credit risk should be systematic risk. It is to this goal that every portfolio manager would like to drive his portfolio. As the number of exposures in a credit folio increase, the total risk on the credit portfolio declines, as shown by Fig. 14.2.

As is evident from Fig. 14.2, theoretically, all firm-specific risks can be diversified away and the ultimate risks impacting the portfolio ought to be of systematic nature. The nonsystematic risks of a credit portfolio can be managed more effectively and it is possible to eliminate them completely by diversification, and hence the name diversifiable risk.



Fig. 14.2 Portfolio credit risk behaviour

However, this argument applies more to large financial institutions and large groups (with business interests in different areas/industries). The inherent focus of single productline manufacturing and other non-financial businesses in certain specific sectors, limits the scope of elimination of the firm risks through diversification. For example, demand in the paint industry always depends upon the performance of the construction sector, and any desire to completely eliminate this risk by diversifying away from the construction sector is unrealistic. Still, diversification across firms from different regions and sizes and finding alternative sectors using certain paint derivatives are still meaningful.

The eight major diversifiable risks impacting a credit portfolio are given below:

1. Asset Class

Usually credit assets are derived from many types of customers. Usually the customers are classified into small, medium and large, each one showing distinctive features. Small businesses are often owner-managed and highly localized. Medium type businesses are often managed with the help of a few hired managers with proper delegation of key functions such as production, sales and finance. Large enterprises have the maximum degree of specialization and often deploy advanced techniques of management and controls. They attract well-qualified, experienced professionals in key areas and adopt sophisticated business strategies. Accordingly, large companies tend to be tough negotiators and often bargain large credit facilities at competitive pricing while the small business often display the opposite features. If the credit portfolio consists mainly of any single asset class, the portfolio risk tends to be relatively higher compared to a situation where the portfolio is dispersed among all asset classes.

2. Exposure Risk

The amount exposed to credit risk is termed as exposure risk. Even when the firm credit risk is acceptable, concentration of exposures in a few customers can spell doom occasionally. Once this weakness is identified, diversifying away from the few concentrated exposures should be given priority. Suppose ABC Ltd has 100 customers in its credit portfolio with an outstanding of Rs. 200M. However, the exposure to one customer alone accounts for Rs. 160M with the balance Rs. 40M spread across the remaining 99 customers across diverse industries. Exposure risk is evident here, with too much reliance on a single customer, who accounts for 80% of the total portfolio. Unless a portfolio approach is initiated similar exposure risks may go unnoticed.

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Similarly, different types of credit facilities have differing exposure nature. For instance, a trader of consumer durables has two types of credit sales. One is the normal credit period of one month, while the other provides 24 monthly instalments to settle the dues. While in the case of former the exposure is for the full sales price for one month, in the case of latter, the initial exposure of sales price + interest for the period will be reducing over months. The trader should strike a balance between the two types of credits and cash sales so that adequate cash flow position can be maintained. In normal cases, conducting the entire sales through instalment credits with final collection after 24 months is riskier from the portfolio point of view.

3. Industry Risks

An ideal portfolio ought to be balanced, with a differing mix of obligors originating from different industries, and of various sizes and types. Diversification can be done by two methods — traditional and modern. In the traditional method, an assortment of different sectors is selected for diversification, mainly by fixing a cap limit for each sector. Modern methods determine scientifically the type and extent of diversification required in the portfolio, drawing upon portfolio theories (PT), among other things. While PT was primarily drawn up with a view of the stock market, the core-principle can be extended to portfolio credit risk management as well. We will see more of this in Chapter 16.

4. Region/Location/Country Risks

Rather than focusing the credit assets in a particular region, a portfolio scattered over a wide area offers comfort from the portfolio point of view. It ensures that the vagaries in a particular region will not impact all sections of the portfolio. Businesses with international nature find it necessary to accept country risk exposures. Such an exposure also arises where a group entity in one country grants a credit facility to an obligor in another country by way of exports or otherwise. If the external credit exposure has a significant role, it is better to disperse among several countries.

5. Quality Risks

The quality of the credit portfolio is an overriding concern for all enterprises having sizable credit risk exposure. Any deterioration in the quality not only increases the potential bad debts but also highlights the poor credit selection at the firm level. Ideally it is better to fill

the credit portfolio with AAA category credit assets. But it is an Utopian dream for credit portfolio managers, given the realities of the business world. Usually, it is better to have a target quality of portfolio in mind—say 92% to 95% of the total portfolio ought to be rated higher than BBB (or medium firm credit risk) and devise strategies to attain this. Both default and migration probabilities of a particular industry sector or a group of customers or different risk grades should be studied to understand the quality risk of the portfolio.

6. Maturity Risks

Credit assets mature after the expiry of differing credit periods. The average maturity of the portfolio should be effectively managed in order to avoid any liquidity problems. Maturity depends upon the nature of the business. While most of the traders, commercial banks and manufacturers have mostly short-term credits in their portfolio, term lending institutions tend to have credits maturing after several years. Similarly, suppliers of machineries and capital goods also tend to give longer credit terms. However, given the importance of liquidity, a portfolio comprising only lengthy credits is often not advisable unless matched against long-term funds. Sometimes this aspect is ignored in real life, resulting in prolonged weighted average portfolio maturities leading to liquidity problems. For instance, usually most government contractors find that the settlement is inordinately delayed because of the usual red tape of budgetary constraints. While the receivables are good for collection, they take a long period to collect, which means the maturity of such a portfolio tends to be on the longer side. In case of current pressing payments to employees, suppliers and financial intermediaries the prolonged average maturity of credit portfolio can lead to problems.

7. Currency Risks

Where the credit assets and obligations are denoted in local currency, currency risk does not arise in any significant manner. However, when the obligations to be met from the realization of credit assets are denoted in different currencies, currency risk impacts, as was experienced in 1997/98 by certain Far-East businesses. They relied on cheap foreign currency loans to finance local credit assets, but faced serious problems when there was sudden devaluation of local currency. Both diversification and hedging are considered effective solutions to currency risks.

8. Collateral Risk

Many creditors, especially creditor banks, accept collateral as security to mitigate credit risks. But at the portfolio level it carries a risk. Imagine a situation where the creditor

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accepts only one kind of security—real estate with 50% margin. In the event of a sharp fall in property prices beyond the 50% level, the comfort of the portfolio disappears. During the late 1980s and early 1990s, Japanese banks faced a similar situation. They financed against real estate, and during the recession that followed, found that the liquidation of the collateral did not cover the loans extended, and in certain instances did not meet even the interest obligations, leave alone the principal. Many banks collapsed. Hence, the market correlation among the collateral securities and the concentration risks of the collateral portfolio and the capacity of the market to absorb the sale of collateral in times of counterparty default, necessitates diversification of collaterals as well.

Given the dynamic environment in which modern day businesses operate, new risks are always a reality. The strategy of keeping the eggs in many baskets does ensure portfolio risk mitigation. The real ability depends upon the identification and creation of baskets, which are discussed later.

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Firm credit risk measures the ability of the borrower or debtor to settle the dues on time after confirming its creditworthiness based on the EIIF model. It is satisfactory if all the borrowers enjoy a satisfactory credit rating falling not below the 'medium category' captured vide the Risk Matrix, discussed in Chapter 4.

However, as we have discussed, at the portfolio level a bunch of satisfactory firm credit risks need not provide comfort. By now it is clear that 1,000 'medium category' firm credit risk exposures need not translate into medium portfolio risk if the portfolio suffers from concentration risk in any specific sector, region, etc. Higher the concentration in the portfolio in any given segment, higher the portfolio risk.

Managing both firm credit risks and portfolio risks on a day-to-day basis is vital for any business that creates credit assets in its normal course of activities. Let us see how both firm credit risks and portfolio risks move in the day-to-day affairs of a business that is highly dependent on credit assets.

15.1 FIRM CREDIT RISKS AND PORTFOLIO CREDIT RISKS IN DAILY LIFE

In small businesses the owner himself takes decisions on all credit matters, focusing mainly on firm credit risk. The limited geographical spread and often restricted products and clients, coupled with lack of portfolio management skills result in skipping the latter. As long as conditions remain stable, the situation is acceptable.

Progressing into medium scale enterprises, a specialist, usually Finance Manager (FM) or Credit Controller reporting to the FM or Managing Partner/Director is in charge of debtors' portfolio and takes credit decisions, usually after the study of financial

statements, market information, bankers' reference, etc. Portfolio management is a clear responsibility and is often handled by the same individual, although division of responsibility of firm credit risk and portfolio risk between two individuals is better/desirable. At any given point in time, credit executives are really managing a portfolio of credit risks. Ideally they should take a final credit decision after considering both credit risks—whether the firm credit risk is acceptable (say, at least medium category as per the Risk Matrix with/without suitable mitigants) and how it impacts the overall credit portfolio risk.

In the case of large businesses such as banks, multi-nationals and mega-companies, the areas of firm credit risks and portfolio credit risks are differentiated and handled by separate departments. Normally, firm credit risks are studied by front-level executives (in the marketing department or branches) who originate the credit assets. Back-office credit executives in the Credit Risk Department, who look at the structure, mix and other sub-portfolio aspects of credit exposures, handle portfolio risks. In such large organizations, the roles of the credit executive at the front-line and the one at a controlling office would be discrete, although both aim at tackling credit risk. The front-line credit executive will be more involved with minimizing firm credit risks. Credit executives at the controlling office have a bigger role to play in reducing the portfolio credit risks, by selecting appropriate mitigants, which we will discuss in the next chapter. Usually in today's world, the portfolio managers at controlling offices—viz. zonal/regional/head office- have more say, and, given their knowledge of risk of sub-portfolios (categorized by sector, industry, region, etc.) determine the desirability of firm-level credit exposures in respective sub-portfolios. The front-line credit executives have the responsibility of identifying acceptable firm credit risks within the respective specific/target sub-portfolios.

While the portfolio perspective is quite different from that of the individual credit assets, both are interlinked because a portfolio does not exist unless there are several credit assets. As we have seen, portfolio credit risk is the agglomeration of several individual firm risks, although portfolio credit risk behaviour tends to be different from firm credit risk behaviour.

15.2 DECLINE AND FALL OF CREDIT ASSETS

Awareness of the stages which a credit asset passes through is a good guide to effectively understand how various firm credit risks and portfolio credit risks trigger credit losses. The understanding of the road to credit loss is critical to manage credit portfolio risks Chapter 15: INTERACTION OF FIRM RISKS AND PORTFOLIO RISKS

and put monitoring devices in place. The major milestones in the road are 'migration, default, estimation of credit loss (loss given default) and ultimate write-offs'.

1. Migration

Migration means the tendency of a single customer or a group of customers to move towards a lower risk grade.¹ It signifies the deterioration in the creditworthiness and highlights the increase in credit risk. Migration risk can be studied from both portfolio-and firm-levels.

a. Firm Credit Risk Migration

Firm credit risk is dynamic, often undergoing changes during the course of time. So, a 'low' credit risk can become medium or even high over time. The reason is the impact of dynamic risk factors discussed under the EIIF Model. As we have seen in Chapter 9, obligors are classified on the basis of a rating scale, represented by alpha-numeric numbers, capturing different levels of their creditworthiness. Higher ratings represent low credit risk while low ratings represent high credit risk. A table can be prepared to show how different credit grades behave over time. This is usually known as the Transition/Migration Matrix, and it describes the probabilities of being in any of the various grades. Usually, a one-year transition horizon is standard for the study of migration of credit risk exposures. A historical data of annual migration matrices if compiled, or a transition study exceeding one year, if undertaken, may prove useful to study the medium-/long-term impact of business cycles and other systematic factors. Besides, the matrices over longer time periods offer the advantage of less noise inherent in the data, as short-term noise cancels itself out over longer horizons. Table 15.1 provides a sample Credit Migration Table/Matrix.

A unique feature of this matrix is the high probability factor on the diagonal. The obligors are most likely to maintain their current rating. Given the initial rating, the second largest probabilities of possible ratings are usually in direct neighbourhood to the diagonal. Generally, the farther away a cell is from the diagonal, the smaller is the like-lihood of migration to that cell. Although a typical migration matrix is concentrated along the diagonal, the observation density diminishes rapidly as we move away. For instance, only about 61% of Grade 7 customers will continue at that grade. A significant part of it (24%) will be written off, while about 15% is upgraded. But none of them attains

¹ It is true that a credit asset can migrate to a better quality. However, in line with our topic—decline & fall of a credit asset—the migration refers to migration to lower quality grades.

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7
Grade 1	91.93%	0.64%	0.07%	0.04%	0.04%	-	-
Grade 2	7.46%	91.81 %	2.27%	0.27%	0.10%	0.10%	0.19%
Grade 3	0.48%	6.75%	91.69%	5.56%	0.61%	0.28%	0.37%
Grade 4	0.08%	0.60%	5.11%	87.88%	7.75%	0.46%	0.75%
Grade 5	0.04%	0.06%	0.56%	4.83%	81.48%	6.95%	2.43%
Grade 6	-	0.12%	0.25%	1.02%	7.89%	82.80%	12.13%
Grade 7	-	0.02%	0.01%	0.17%	1.11%	3.96%	60.45%
Write-Offs	-	-	0.04%	0.24%	1.01%	5.45%	23.69%

Table 15.1 A tentative Credit Migration table for a specified period (usually one year).

Grade I category, although there is one instance up to Grade 2. Such cases usually happen consequent upon the takeover of the troublesome customer by a sound business group. The relatively high volatility in Grade 7 is attributable to two factors: (a) Certain CCC-rated firms are 'do-or-die' type firms. Their very risky nature makes them highly default-prone, but if successful, they have a significant chance of moving their way to higher ratings and (b) Creditors can know the fate of the credit asset belonging to this category sooner than that of higher grades. Either the payment is realized or has to be written off or fully provided for.

b. Portfolio Risk Migration

Migration study, especially of sub-portfolios, highlights both the risky and stable areas of the portfolio. The risk of change in portfolio credit quality is real, given the dynamic environment. But the degree of change in the portfolio differs from year to year, as the changes in the macro-economic factors vary in a dissimilar manner across years. A study conducted by Moodys has shown that during the recessions in 1930s and mid-1970s, USA witnessed the highest downgrades. Hence, at portfolio level, the migration should be linked to systematic risk factors.

For instance, a bank (in India) with large exposures to non-banking finance companies (NBFC sector) during the early 1990s might have found the sub-portfolio of NBFC with 10% rated at Grade 2, 80% at Grade 3 and 10% at Grade 4. However, by the late 1990s or early 2000, the sub-portfolio should have reflected a tighter situation, assuming the sub-portfolio constituents remained the same. Hence the portfolio risk might have migrated to 1% at Grade 2, 70% at Grade 3, 25% at Grade 4 and the remaining under lower grades. The systematic factor that triggered the portfolio risk migration was the change in RBI policies,

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which imposed strict terms for operations of NBFCs. A historical database of a migration table covering a time horizon covering a business cycle (5–10 years) does help the business entity to identify the parts of the portfolio vulnerable to specific external/systematic risks.

While migration study (study of downgrade risk) itself does not unearth any credit losses, it is significant because of the following reasons: (a) It avoids surprises and provides an idea about the credit asset/portfolio's future credit quality (b) Facilitates pricing decisions (c) Facilitates active portfolio management (d) Optimizes regulatory/economic capital needed and (e) Indicates the provisioning requirements, among others.

2. Default Risk

Default risk can also be looked at from both firm and portfolio perspectives.

a. Firm-level defaults

As the name implies, the obligor defaults on due date and it may lead to partial or full loss of the credit asset. Defaults are of various types. (a) **Simple default** is often another term used to denote the failure to pay. While in banking circles it is commonly stated as past dues, in other business sectors it is stated as overdue. Both connote the same event: The obligor did not pay on the maturity date. Default is treated with seriousness in all businesses. If it persists for more than 90 days, usually banks and financial institutions downgrade the credit asset concerned, to the watch list (sometimes even non-performing) category. However, if the obligor is able to settle within a period less than 90 days, the asset continues to be performing, although repeated instances call for an investigation into the causes and appropriate downgrading, if needed. (b) **Restructuring** is yet another instance of default. The fact that the facilities are restructured shows that the borrower/debtor/ obligor is not a position to meet the dues. (c) **Declaration of bankruptcy/liquidation** is yet another instance of default. (d) Similarly, favourable **application to BIFR** (Board For Industrial & Financial Reconstruction) or similar protection which would avoid or delay repayment of the credit obligations also can be treated as a default. All these instances highlight the payment difficulties faced by the obligor, enhancing the probability of credit loss.

Yet another related concept is 'technical default'. In this case, while the creditworthiness and capacity to repay the obligation remain satisfactory, the obligor may be held under technical default. This happens usually in connection with the breach of covenants and conditions.

Default risk is the uncertainty surrounding a firm's ability to service its debts and obligations. Prior to default, we can discriminate between firms that will default and those that will not, based on EIIF study. This should form the basis for making probabilistic assessments of the likelihood of default. This is called Probability of Default (PD). As mentioned earlier (para 13.3), the PD can range from 0.00% for a zero risk customer to 100% for a very high-risk customer.

For example, whilst a AA rated customer might be assigned a PD of 0.9% p.a. (viz. likelihood that a AA rated firm would default is only 9 in 1,000 per year) BB rated customer would be assigned a PD of 9%.w

All defaults need not result in the loss of entire credit outstanding. The loss suffered by a lender in the event of default is determined largely by the structure of the particular contract or obligation. If covered by sound collateral, the actual loss can be minimized. This topic will be covered by 'Loss Given Default' discussed later in this chapter.

Prof. Merton introduced a Model, which logically explains the PD in most cases. According to the model prepared by him, the firm default occurs when the market value of the firm's assets falls to the default point (equivalent to the face value of debt). The greater the distance between market value of assets and the default point during the credit horizon period (usually assumed to be one year) the better. Shorter distance means the risk is higher. Once default occurs, creditors receive the market value of the firm's assets. The fundamentals of the model can be captured as Fig. 15.1 shows.



Fig. 15.1 Theoritical representations of Firms' Default

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In most cases, the change is gradual over time as depicted by the free curve. Higher the distance between the assets and liabilities, lower is the PD. Even the migration can be fit into the model. Viz., if the distance gets shorter, it denotes migration risk.

Whilst the model generally explains the default, the actual default need not be an inevitable consequence. If the bulk of the debt is long term and not payable in the near future, the default may not happen due to the maturity factor. The firm can work on turnaround strategies and can make the asset/liability equation favourable, by the time the debts mature for payment. Sometimes, how one looks at the market value of the assets can be vital. It could be 'break-up' value of the assets or 'going on concern' value of the assets. Whilst in the former the selling value is considered, in the latter, the cash flows generated from the use of the assets is taken into account. For instance, the realizable value of the assets of the petrochemical plant is likely to be less than the book value. However, the cash generation (or economic benefits) can be the key factor to be considered for assessing the repayment capacity. In such scenarios the asset value may be considered as a going on concern. Viz. assess the value of the business, in terms of its future. In other words, it requires a valuation of business, which should show a favourable future for the entity. This is one of the main reasons why, many of the distressed firms are often taken over by a stronger entity.

b. Portfolio-Level Defaults

Portfolio default risks pertain to a situation where all credit assets in a portfolio or sub-portfolio default together. Such a situation, where most constituents of portfolio default together, is usually triggered by systematic risks. For instance, during the 1998 forex crisis in the Far East, portfolios and sub-portfolios of many financial institutions were hit. The impact was so huge in certain portfolios that the entire institution (e.g. Prudential, Hong Kong) collapsed. So was the case with the credit portfolio of Nedungadi Bank, which was put under moratorium by RBI before merging with PNB. Portfolio default risks trigger 'portfolio provisioning' which is taken up later in this chapter.

In other words, besides the awareness of firm default probability, the portfolio-level management of default risk is required, which calls for the measurement of default correlations. Default correlation refers to the measurement of the degree to which the default risks of the various portfolio components are related.

3. Loss Given Default (LGD)

If the default situation cannot be rectified, steps to recoveries are required. It is better if the credit asset is recovered to its full book value in which no credit loss has arisen. However, in the event of default, unless fully secured by top quality collateral, the loss is inevitable. Loss Given Default (LGD) is calculated as below:

LGD% = 1 - recovery rate

Recovery rate can also be termed as 'Value Given Default'. It refers to the recoverable part of the credit asset. It depends upon several factors such as the level of realizable value of collateral (if any), possible liquidation of the unencumbered assets in the balance sheet of the customer, evoking guarantees, integrity of the obligor, etc. Whatever remains after the expected recovery should be fully provided for. To the extent possible, personnel independent of the underwriting, monitoring and collection functions should conduct the LGD estimation. Also, while the specific lines of reporting depend on the complexity of the organizational structure, it is better if the personnel making the final determination of the loss allowances/provisions report to a level that is independent of the credit process.

Most of the default situations trigger negotiations with the obligor with the aim of full settlement. While not all defaults lead to credit loss, the probability of credit loss is high, in-as-much as the default itself highlights the liquidity crisis of the obligor. Actual credit loss is a futuristic event, that can only be estimated and the basic ingredients of a credit loss (firm-level) calculation are exposure, PD, recovery and maturity. Usually the maturity (credit tenor) is treated as one year. Hence, the expected credit loss can be calculated as below:

 $\begin{array}{l} \mbox{Expected Credit Loss} = \mbox{Exposure} \times \mbox{PD} \times \mbox{LGD} \\ \mbox{Exposure} \times \mbox{default probability} \times (1 - \mbox{recovery rate}) \end{array}$

In fact, it is not easy to compute/predict the recovery rate and hence the models have to make some simplifying assumption that recovery rates are exogenously determined. Past data, history of credit losses and behaviour of systematic factors on credit asset are all good guiding factors in arriving at PD and LGD. In the case of banks, the Basel Committee has specified certain criteria (under SA and IRB-F), to avoid wrangling on a potentially contentious topic.

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As an example, assume a BB rated customer with PD of 9% has an Unsecured Loan of \$100M with 75% LGD. It means that the probable credit loss of the unsecured loan of \$100M to a BB-rated customer with PD of 9% can be approximated at \$6.75M. ($100 \times 9\% \times 75\%$). At this stage, the Maturity (M) of the credit may also be discussed. While the expected loss in one-year time period is \$6.75M, as the maturity increases, risk increases, hence the probable credit loss also increases. So, continuing the example, if the maturity or tenor of the loan is three years, then the expected credit loss would be 20.25M ($100 \times 9\% \times 75\% \times 3$).

Under IRB Advanced approach, the Basel Committee allows the banks to form their own estimates for LGD, but the process of estimation should meet the minimum standards and approval from respective Central Bank.

We can extend the model (Fig. 15.1) discussed under default risk to the LGD situation as well. Once the market value of assets falls to or below the default point (the debt value), the default is real or will happen soon, while other things remain the same. Once default occurs, creditors receive the market value of the firm's assets. But the market value of assets may not be sufficient to cover the entire debt, and the liquidation expenses are also to be factored in. In such cases, creditors with sound collateral have a distinct advantage.

4. Ultimate Write-Offs

Booking of credit loss is inevitable if the credit asset is not worth its face value. In case recoveries (value given default) are possible, the remaining portion is the loss. In other words, credit loss is the crystallization of LGD.

When the credit asset is ultimately judged uncollectable, it is either written off directly against the income statement or charged off by reducing a previously created provision (or loss reserves/loss allowances). The critical question as to when the write off/provisioning of credit asset should be done, is more or less a judgmental matter. Management is responsible for establishing appropriate provisioning/write-off policies, documenting their methodology and defining the roles of senior management, including Board of Directors. Methodologies should conform to generally accepted accounting principles. Interest recognition, if any, should be on cash basis. International Accounting Standard 39 (IAS 39) is a good guide as far as accounting principles for dealing with credit losses are concerned.

IAS 39 stipulates that the credit loss is the difference between the carrying value of the asset and the present value of expected future recoveries (cash flows). If the credit asset is

of short-term nature, the cash flows are not discounted. Since a discussion of the intricacies of accounting treatment of credit losses is beyond our topic, interested readers are invited to refer to IAS 39 for details. Usually impairment and uncollectability are measured and recognized individually, although application of portfolio basis on a group of credit assets which are not individually identified as impaired, is not uncommon. Either way, the portfolio is impacted. Where credit loss is ascertained on individual credit assets, the portfolio impact is a natural corollary in as much as the portfolio is nothing but a cluster of individual assets.

15.3 IMPACT OF PORTFOLIO CREDIT RISKS

Should all credit assets suffer default or credit loss simultaneously, the portfolio default or loss would be the sum of all simultaneous losses. However, in the case of a reasonably spread portfolio, not all firm credit assets will default at the same time. A small number of losses are much more frequent than a simultaneous failure of all of them. This explains the main difference between portfolio risks and firm credit risks. As discussed earlier, portfolio risk need not be the sum total of firm risks. The beauty of portfolio credit risk is that by intelligent diversification, it can be lowered below the average or total risk of the individual credit risks. Portfolio risk calculations use additional parameters such as correlations and joint probabilities. Correlation is very important from the portfolio context, and is taken up in the next chapter.

Study of migration risk, default risk and credit loss at portfolio level is often linked to the different stages of the business cycle—boom, bust, and normal times—because they can learly guide the portfolio managers to understand the impact of various economic scenarios on portfolio credit risks. Usually downgrades increase in an economic contraction while upgrades surpass the downgrades in times of economic expansion. Migration risk is vital from the portfolio context. While individual migration is important, at the portfolio level the propensity of a homogenous group's susceptibility for downgrade is captured by migration risk.

At the portfolio level, since the study involves myriad constituents, (individual credit assets) sometimes in thousands, the study is undertaken to understand the average migration risk, average default risk and write-offs every year. Portfolio managers always attempt to retain these risks at a specific level so that overall quality of the portfolio remains satisfactory. For instance, some of targets fixed for a financial institution may include the following:

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In boom times, 95% of the credit portfolio should comprise BBB or higher rated credit only.

In bust times, 85% of the credit portfolio should comprise BBB or higher rated credit only.

In normal times, 90% should be the goal.

Portfolio managers strive to rein in migration risks by shuffling portfolio, seeking altered collaterals, and by using other portfolio management measures. It is to be noted that a thorough understanding of the characteristics of the portfolio and the causes of portfolio risks is essential to fix realistic goals and attain them.

15.4 PORTFOLIO PROVISIONING

Many sophisticated financial institutions maintain specific provisions on portfolios well in advance, as a prudent measure, towards future possible credit losses, where an account or a specific credit asset is yet to be identified. The provisioning requirement varies, depending upon the credit rating category. High quality credit categories require lesser provisioning, compared to riskier grades. The general macro-economic outlook, historical experience assimilated through historical data and size of the sub-portfolios are among the other considerations that come into play while arriving at the provisioning requirement. Normally, it is arrived at after studying the past performance of the credit portfolio. An example of such provisioning by a finance institution is shown in Table 15.2.

Details	Positive Outlook	Stable Outlook	Negative Outlook
Category (AAA)	0%	0%	0%
Category II (AA)	0.10%	0.15%	0.20%
Category III (A)	0.20%	0.35%	0.50%
Category IV (BBB)	0.40%	0.60%	0.80%
Category V (BB)	0.60%	0.90%	1.20%
Category VI (B)	1.00%	1.50%	2.00%

 Table 15.2 Portfolio Provisioning.

For instance, if the current economic outlook is stable, it will require nil provisioning on Category I (very low credit risk) while Category II will require 0.15% provisioning by way of debit to the profit and loss account. The charge to the profit and loss account signifies that the expected loss is not a risk but the *cost* of giving credit. It is the *cost* of doing business. Since it is viewed as cost, it is booked into the P&L like any other expense. The price of a transaction must cover the cost, and in this case, the portfolio provisioning. Accordingly, when a creditor (say a bank) creates a credit portfolio (viz. a number of loans), it *expects* some percentage of them to default, which justifies the portfolio provisioning. And as the risk goes up, the probability of default also goes up, captured by increasing portfolio provisioning for higher risk grades, as evident from Table 15.2.

15.5 MANAGING FIRM & PORTFOLIO CREDIT RISKS Vs ORGANIZATIONAL CONFLICT

Both firm-level credit risk analysis and portfolio credit risk analysis are complementary. Effective micro credit analysis and careful portfolio analysis and balancing are prerequisites for efficient credit risk management. Recognition and mutual respect of front-line credit executives and credit portfolio managers is essential to accomplish this. Banks/FIs or non-finance companies with extensive networks of branches have to focus on local considerations for competitive reasons. For example, the sales director of an FMCG may like to continue the supplies on credit to customers in a region despite local disturbances leading to delays in payment and a few instances of bad debts. But the credit portfolio managers in the head office view the region with discomfort and hence suggest caution. Similar differences or conflicts between portfolio managers and front line are more pronounced in banks and FIs with significant credit assets.

A typical incident in day-to-day credit is narrated below:

Example: Mr. Fathi, a front line credit executive of Compliance Bank, visits his customer, one ABC Ltd, a company with sound financials and a proven track record. The Managing Director of the company has recently been involved two new start-ups (PQR Ltd and XYZ Ltd) with some new and existing shareholders of ABC Ltd. The Finance Manager (FM) of ABC seeks removal of the CAPEX covenant that specifies maximum \$15M as CAPEX p.a. The FM highlights the following: (a) None of the four other banks with which ABC deals has imposed such a covenant (b) The covenant was introduced five years ago when the turnover and net profit was just around one-third

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of the present, (c) If at all the bank is bent upon having a covenant, then it should fix the level at above \$30M, giving room for annual depreciation charge of \$19M.

Fathi is eager to maintain this profitable relationship and knows that the customer is being marketed heavily by several other competitor banks.

The request put forth by Fathi has been declined by the appropriate authority (Board/Chairman) in portfolio management, as has been recommended by HO Credit Risk Department. Their contention is that the existing covenant of \$15M is a tool to understand the potential diversion of funds from working capital facilities and hence cannot be waived. Fathi complains that HO credit portfolio management at the head office is too conservative and wishes one among them would convey the message back to the company.

Such instances of friction can be avoided if executives and officers in charge of firmlevel credit analysis and portfolio-level credit analysis show some degree of mutual understanding, recognition and mutual respect. Both types of credit analysis are integral for sound credit risk management. Conflicts can be avoided if both levers of credit risk analysis levels are provided with distinct objectives, which will not only provide clarity to each other but also enable front-line and portfolio executives to be supportive of each other in attaining their objectives.



Portfolio Credit Risk Mitigants

Disasters triggered by credit portfolio risks and attempts to rein them in are not of recent origin. History is replete with instances of credit institutions—mainly banks—suffering immense losses or collapse due to the unbalanced portfolio structure. The London-based early gold (smith) banks of the 1800s failed not because they were actually bankrupt but because they became illiquid due to improper portfolios, resulting in inability to convert certain assets into gold consequent on maturity mismatches. The recurrence of such instances resulted in the Bank of England (central bank) taking the responsibility as re-discounter and lender of last resort.

As the 19th and 20th centuries wore on, central banks began to introduce several tools and measures to ensure stability by controlling the credit risks of banks. Paramount among these were credit portfolio risk mitigants. The Basel Committee too has focused on credit portfolio risk mitigation while prescribing capital adequacy norms. Even now, bank and financial institution crashes and problems created by illiquid or unbalanced portfolios due to inherent portfolio risks are not uncommon. As stated earlier, many banking crashes in Japan in the 1990s were traceable to the overexposure to real estate. The collapse of Barings Bank was also the result of hidden or ignored portfolio risks. In India too, the liquidation of many banks can be traced to credit portfolio risks. In the recent past Nedungadi Bank (NB) and Global Trust Bank were merged with other stronger banks at the behest of Reserve Bank of India as their credit losses mounted, traceable to the weak credit portfolios. Co-operative bank crisis, sudden closure of certain private non-banking financing companies, etc., are also attributable to bad credit portfolios.

Unless suitable portfolio risks mitigants are implemented, such events are likely to continue. Only mega credit disasters get media limelight. Small-scale/medium sector

bankruptcies due to bad credit portfolios go unreported while the inevitable consequences are borne by the hapless stakeholders.

Several tools have been under development, especially during the latter half of the twentieth century to tackle portfolio risks. Initial experiments were in equity portfolio, which later were adapted by portfolio categories such as forex, commodities and credit. Over time it has been established that many of the equity portfolio risk control techniques can be adapted to rein in portfolio credit risks as well. There is a general perception that credit risk analysis is not as risky as equity portfolio. However, as we have seen in Chapter 2, credit risks are equally or even more risky, especially considering the limited upside potential involved. Credit risk should never reach the level of equity risk. Let us discuss the main techniques of managing and mitigating portfolio credit risks.

16.1 TRADITIONAL DIVERSIFICATION

All unsystematic risks mentioned in Chapter 14 can be diversified. Traditional diversification focuses on reducing the concentration risk by dispersing the portfolio among as many variables as possible, so that a large and diversified portfolio is obtained. While various types of diversification are used to achieve this, the three principal ones are discussed below:

1. Counter-party Limit

This is primarily done in financial and non-financial institutions with significant credit risk exposure. In the case of banks, the central bank of the country itself stipulates maximum credit limit to a specific party. Usually it is linked to the TNW of the bank/financial institution/creditor. For instance, it may be stipulated that a single credit exposure to any counter-party should not exceed 10% of the net worth of the creditor.

2. Region-wise Restriction

Multi-national companies, when selecting the part of the world they would like to trade with, mainly adopt this. Too much credit exposure to a volatile region of the world carries higher risk. Hence, usually creditors attempt as much regional diversification as

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possible. However, small banks and localized manufacturing entities do not diversify much on the region, which is of acceptable risk as long as local stability conditions remain.

3. Industry Limit

Large financial undertakings and entities incorporate industry exposure while extending credit. Many financial intermediaries (FIs) usually restrict the exposure to each industry at a specified percentage, say 10% of the total portfolio. Normally financial institutions avoid concentration of exposure in any one sector of the economy. They aim to ensure that the credit portfolio is well spread across a broad mix of business sectors. Portfolio managers are alert to the risks relating to exposures in sectors which are vulnerable to sudden changes in the economic conditions or profoundly reliant on government support. Porter's Model discussed in Chapter 6 is also useful in screening industries. Fig. 16.1 summarizes how the industry risks and industry lifecycle (also see Chapter 6) impact portfolio selection.

Most of the credit portfolio managers would attempt to avoid Stage 1 and Stage 5 companies, given the higher risks involved. Within Stage 2–4, the industry attractiveness



Fig. 16.1 Industry Lifecycle and Risk.

depends on factors we discussed in Chapter 6. Since all industry sectors are not equally attractive, it is better to make a sub-segmentation of the industries based on their appeal. One method of classifying industries based on their attractiveness is to segment them into the following three sectors:

a. Target Industries/Sectors

These industries hold promise for the future, the reasons for which can extend from good growth to inevitability to the infrastructure of the economy. Given the potential, these types of industries are highly desired. Further increases in the credit portfolios will focus on the target sectors. Front-line office units will have to tune their business development efforts to the identified 'target' sectors. Depending upon the region and economy, multi-sector conglomerates, reputed business names, core industries (e.g., petrochemicals in the Middle-East or large trade houses in Hong Kong or Singapore, etc.), usually come under the target segment, which is also considered as a low risk area. Each country or region would have competitive advantages providing tactical edge to certain types of industries in that region compared to other areas.

b. Restricted (or Maintain) Sectors

These sectors are suspectible to any possible slowdown in economic conditions, or operate in a highly competitive environment. Most players in the market vie for market share, resorting to cut-throat competition practices, with differing attendant risks such as liquidity crisis, growth in non-collectable debt, poor inventory management and so on. However, a few players will continue to do well due to their inherent strengths, which we have covered in Chapter 7. Accordingly, not all business units in the sector are shunned, but a cap is placed to ensure that only outstanding customers are accepted and that too up to a limit. For example, it is possible that automobile spare part dealers are imposed a cap of 2% of total funded and 3% of total non-funded advances by certain banks.

c. Avoid (or Watch-List) Sectors

The sectors where a financial institution wishes to develop its exposure very cautiously, are called watch-list sectors. Such areas are highly vulnerable to a downturn in the economy in general or to specific sectoral pressures such as delays in realization of dues—especially true for government-sector-reliant businesses. For instance, most of the agriculture in Europe is heavily dependent on the government for survival. Another

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such area across most parts of the world is that of readymade garments. Retailing clothing is invariably low-margin, and requires a professional understanding of cash flows, stock requirements, rental costs, and above all, fashion trends. Given the low barriers of entry, new entrants are common, adding heat to a tough competitive environment. Only firms with successful differentiation strategies and competitive advantages can survive. A creditor bank or FI or any enterprise should be watchful when accepting credit exposure this area, and should ensure adequate mitigants such as strong collaterals or sustainable competitive advantages.

16.2 SCIENTIFIC DIVERSIFICATION OF CREDIT PORTFOLIO

The traditional diversification is successful as the portfolio risk is spread among various entities such that poor performance of certain sectors and entities will not incapacitate the portfolio. However, the traditional approach can be improved upon by studying the interrelationships among the portfolio components. For example while traditional diversification contents itself when they include cement, paint and waterproofing industries in its credit portfolio, the strong interrelationship linked to the construction activities in the economy is often ignored. In a downturn of construction sector all three industries will be impacted together. On the other hand, suppose the credit portfolio comprises food, paint and tyre industries, which are driven by different external factors –food is considered a non-cyclical item depending on population growth, paint on construction and tyre on the number of automobiles. In this case, the portfolio risk tends to be lower as downturn in any specific sector will not pull down all the constituents of the portfolio. Statistically speaking, in this instance the industries are not perfectly correlated.

Traditional Diversification can be improved upon by studying the (i) correlation among various assets, industries, sectors, etc and (ii) proportion of assets or group of assets in a portfolio.

Measuring Portfolio Risk

The role of correlation in a portfolio has been one of the cornerstones of innovative Portfolio Selection (PS) Theory put forward by Nobel Prize winner Markowitz. Correlation is a measure, which studies the relation between two or more variables. Correlation coefficients can range from -1 to +1. The value of -1 represents a perfect

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negative correlation, which means the variables move in opposite directions while a value of +1 represents a perfect positive correlation. It denotes both variables move in tandem. A value of zero represents a lack of correlation.

PS is widely held to be the scientific way of managing a portfolio. Initially PS was aimed at stock market, however later found applications in several other areas wherever portfolios were involved. Among others, PS stated that as you diversify your portfolio the portfolio risk reduces depending upon the correlation of portfolio components. Standard deviation has been considered as the proxy of risk and the following formula has been prescribed to calculate portfolio risk:

Where, n = Number of Assets in the Portfolio

To avoid the mathematical complexities and to proceed straight into the heart of the theory, let us consider a two assets portfolio (viz. n=2), in which case the formula would be:

$$\delta p = [(Xi \ \delta i)^2 + (Xj \ \delta j)^2 + 2 Xi \ Xj \ \delta i \ \delta j \ \tilde{n}ij]^{1/2}$$

Where, σp = Portfolio standard deviation

Xi = Proportion of total portfolio invested in asset i

 X_j = Proportion of total portfolio invested in asset j

 $\sigma i = Standard Deviation of asset i$

 $\sigma j =$ Standard Deviation of asset j

pij = Correlation Coefficient between assets i and j

$$\sigma = \left[\sum d^2 / n\right]^{\%}$$

Standard Deviation of an asset can be calculated by using the following formula:

Where, d = Difference between the Mean and all observed values n = No. of observations

Correlation Coefficient between assets can be calculated by using the following formula

$$pij = \frac{Covariance(i, j)}{\sigma i \ \sigma j}$$

Covariance
$$(i, j) = \frac{1}{n} \sum [di \ dj]$$

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Since standard deviation is the proxy of the risk, portfolio risk (portfolio standard deviation) would be lowest for perfectly negatively correlated assets. Following example illustrates the point:

Example

You have the choice of two assets -X and Y - to be included in a portfolio. You are advised that the rate of returns will fluctuate under the two likely scenarios given below:

Scenarios	X	Y
Return in Appreciation of Euro	3.5%	6.5%
Return in Depreciation of Euro	5.5%	2.5%
Average Return	4.5%	4.5%

You are requested to structure a diversified portfolio with X and Y by determining a portfolio mix that would minimize the portfolio risk.

Solution

Following steps are involved in arriving at the best portfolio mix:

a) Calculation of Standard Deviations (SD) of Assets X and Y

Particulars	X	Asset X d =x -Av.X	d 2	Y	Asset Y D =y -Av.Y	d 2
Return in Appreciation of Euro	3.5%	-1%	0.01%	6.5%	2%	0.04%
Return in Depreciation of Euro	5.5%	1%	0.01%	2.5%	-2%	0.04%
Average (Mean) Return	4.5%			4.5%		
Sum of Squared Deviations (a)			0.02%			0.08%
No of Observations (n)			2			2
∴ Standard Deviations SQRT (a/n)			1%			2%

 Table 16.1 Calculation of Standard Deviation

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The above table shows that standard deviations of Assets X and Y are 1% and 2% respectively. Asset X has lower Standard Deviation compared to Asset Y. However, as we will observe later, by mixing appropriate proportion of Asset Y, the Portfolio Standard Deviation can be brought lower than that of Asset X - viz. below 1%.

Particulars	x- AvX (i) Asset X	y- AvY (ii) Asset Y	Combined* (i×ii)
Scenario 1 - Appreciation of Euro	-1%	2%	-0.02%
Scenario 2 - Depreciation	1%	-2%	-0.02%
of Euro			
Total (b)			-0.04%
No of Observations (n)			2
Covariance $(c = b/n)$			-0.02%
Standard Deviations (d)	1.00%	2.00%	
\therefore Correlation (c/d)		-1	

b) Calculation of Correlation between Assets X and Y

 Table 16.2 Calculation of Correlation between Assets X and Y

As evident from the above table, Assets X and Y are showing a perfect negative correlation. It means that both assets tend to move in opposite directions, under differing scenarios under consideration.

c) Portfolio Mixes & Portfolio Standard Deviation (SD)

Particulars	Asset X	Asset Y	Portfolio SD	
Portfolio Mix 90:10	90%	10%	0.70%	
Portfolio Mix 80:20	80%	20%	0.40%	
Portfolio Mix 70:30	70%	30%	0.10%	
Portfolio Mix 60:40	60%	40%	0.20%	
Portfolio Mix 50:50	50%	50%	0.50%	
Portfolio Mix 40:60	40%	60%	0.80%	
Portfolio Mix 30:70	30%	70%	1.10%	
Portfolio Mix 20:80	20%	80%	1.40%	

 Table 16.3 Portfolio Risk under different portfolio mixes

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Whilst Assets X and Y have a standard deviation of 1% and 2% respectively, a portfolio of both in 50:50 ratio has a portfolio standard deviation of just 0.5%. However, the portfolio risk can be reduced further, if the Assets X and Y are combined in the ratio of 70:30, in which case the portfolio Standard Deviation is just 0.10%. Since both assets have a perfect negative correlation, it is possible to arrive at a zero portfolio standard deviation by combining Assets in the ratio of 66:34. It means that under both scenarios this portfolio mix will yield 4.5% eliminating the risk of lower returns.

The above example exemplifies the role of correlation and proportions in a portfolio. The idea conveyed contains an undeniable truth. As you diversify your portfolio the portfolio risk reduces depending upon the correlation of portfolio components. Lower the correlation, lower the portfolio standard deviation. Combining two assets with perfect negative correlation reduces the portfolio standard deviation to zero. Since, there is no great benefit by combining assets with perfect positive correlation, the portfolio manager should prefer less correlated assets or group of assets. Understanding of (a) correlation among various assets, industries, sectors, etc and (b) their proportion in the portfolio is essential for effective management of portfolio risk. This conceptual model applies to the credit portfolio as surely as it applies to other portfolios, such as equity portfolios.

There are criticisms against PS. The major ones are (a) PS attempts to replace intuition with measurement & prescription and if the intuition comes up with better alternatives, the whole exercise is a waste. (b) Use of past data to look into the future; PS inputs statistical variables such as mean, standard deviation, variance and other numbers based on past historical data.

Despite criticisms, the contribution by Markowitz was outstanding and the ideas of PS are extended to many other areas such as Commodities, Foreign Exchange and Credit, wherever risk plays an important role to bring in effective portfolio risk diversification. Core fundamentals of PS concepts can also be effectively applied to credit portfolio by studying the proportions and correlation characteristics of the portfolio components. However, mostly the application of quantitative techniques to attain indepth scientific portfolio diversification of credit risk is still evolving, as we will see in the next section.

Quantitative Techniques in Credit Portfolio Analysis

Although the quantitative methods for portfolio analysis developed since Markowitz's pioneering work in 1950s, have been applied successfully in a variety of areas of

finance, notably to equity portfolios, their application to credit portfolio can be stated to be still evolving. Whilst PS concepts are relevant to credit portfolio managers the absence of similar development (compared to equity segment) in the application of quantitative methods to Credit Portfolios is generally attributed to the greater empirical difficulties such as:

- a. Whilst the daily price movements in a Stock Market reflect the risk perceptions attached to the equity, no such luxury exists for a general credit portfolio. Another corollary aspect is that the face value of the credit asset does not have much upside potential, which an equity asset enjoys.
- b. As discussed earlier, understanding the correlation between two credit assets is essential for sound portfolio diversification, which is also known as Asset Correlation. However, credit risk diversification goes beyond Asset Correlation. Another important correlation to be studied is Default Correlation. It measures the correlation between the two credit assets that will default together. If historical data is relied for Default Correlation it would show the following - ('i) All actual defaults are positively (although need not be perfectly positively) correlated. Negative default correlations are rare, if not non-existent. (ii) At the lower end of the Credit Grades -say BB and below- Default Correlation tends to be high. It simply means the default is more likely. Therefore dissimilar industry features or low Asset Correlation do not carry much comfort due to the possibility of joint collapse of credit assets usually traceable to the inherent firm-level defects (either internal or financial). In such cases, the common factor of higher level of firm-level defects weighs more than the industry / asset correlation. (iii) At the higher end of Credit Grades -say AA and above- the Default Correlation is weak.
- c. Unlike equity, capital can be protected through risk mitigants such as covenants and collaterals in credit. Given the fact that collaterals and covenants differ from credit asset to credit asset, a general quantification could be difficult and challenging. Since the credit risk mitigants are effective at borrower level, they have impact at portfolio level as well, which merits to be quantified in any attempt to apply quantitative methods to portfolio credit risk.
- d. Unlike equity markets, bulk of the credit markets are closely regulated and protected by Central Banks of every nation, which too have limited the incentives to search for quantitative solutions. With the advent of Basel II for banks, a

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more active approach towards development and application quantification of credit risk management and diversification is expected to be encouraged.

The good news is that more effort is being directed towards applying quantitative techniques in Credit Risk and appreciable advances (e.g. KMV Portfolio Manager TM) have been achieved in this direction based upon the foundations laid by Markowitz, Sharpe and Merton, among many others. Going forward, more sophisticated tools for measuring and managing credit risk will be developed due to the several favourable emerging factors such as new Basel II rules, globalization, deregulation, market liberalization, competition, the emergence of secondary credit markets and credit derivatives, among others.

16.3 CREDIT DERIVATIVES

Credit derivatives have been heralded as path-breaking products that enable (mainly financial) institutions to manage credit risks separately from other types of financial risk, with more flexibility. Credit derivatives enable banks and other financial institutions to hedge loans to guard against deterioration in the value of their credit portfolio.

Credit derivative is a bilateral contract entered between two parties to transfer specific aspects of the credit risk on a specified debt obligation among themselves. Credit derivatives allow holders of credit assets or fixed income securities to trade off some (or all) of the credit risk on the assets held (reference assets). With credit derivatives, holders of credit assets such as FIs/banks can diversify their credit exposures for their portfolios and/or hedge their concentrated risks. As a tool of credit risk management, credit derivatives enable the transfer of credit risks to other parties that provide for compensation (payments to be received) in the event of specific losses being incurred.

Payout on a credit derivative is usually activated by the occurrence of a credit event that affects the credit status of the reference asset. Normal instances of credit events are as given below:

- Default by the reference name (obligor) to meet its payment commitments when due;
- Moratorium (for sovereign entities) or bankruptcy (for non-sovereigns);
- Restructuring of the debt (credit asset) with materially adverse consequences;

• Cross-default-clause-triggered credit event. (A credit event on other obligations of the reference name which triggers a cross-default clause on the reference asset.)

Besides, it may be noted that other events may be considered as credit-eventsufficient to crystallize the derivative, depending upon the mutual agreement between the parties. For example, ratings downgrade can be treated as a credit event in the agreement. The notion of materiality is a key element in the definition of a credit event. It is intended to preclude either of the parties involved in a credit derivative from declaring a credit event when the event itself does not materially influence the value of the reference asset.

Credit derivatives are mainly of five types as detailed below:

1. Credit Default Swap (CDS)

Credit default swap (CDS) allows the creditor (or the protection buyer) to transfer credit risk to another party by paying a fixed amount, either in one lumpsum or at regular intervals. The other party (the protection seller or insurer) makes a termination payment if a credit event—as per the agreement—is triggered. Accordingly, CDS allows the protection buyer to transfer the default risk on the reference asset to the protection seller for a fee. The protection period need not match the maturity of the underlying reference asset. A firm holding a credit asset and fearing default or desiring to get rid of the credit risk for whatever reason, can make use of CDS. The firm can enter into a CDS with another party who will compensate (termination payment) if there is any default or on occurrence of mutually agreed credit events.

While the parties concerned can mutually agree on the credit event, the typical credit events are bankruptcy, insolvency, a credit downgrade or failure to make a required scheduled payment.

Termination payment is the critical part of the Credit Default Swap. It determines how much money can be recovered from the protection seller in the event of the occurrence of a credit event. One aspect of the termination payment is that it is a contingent event. The contingency factor is determined by the credit event. The contingent termination payment is commonly based on a formula such as:

Termination payment = Notional amount \times (Initial value – Recovery value)
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Recovery value (akin to value at default, discussed in Chapter 15) is the estimated market price of the collateral (or of the financial instrument) when a credit event has been declared. *Initial value* may be any one of the following:

- Face value (exposure amount);
- In the case of a financial instrument, the market price of the reference asset at the start of the swap;
- Some agreed percentage of par, say 98.50% (so amount paid is subject to a **deductible** of 1.50% in the event of a claim).

The calculation of the fixed payment is typically expressed as a percentage per annum of the notional amount. The structure of a CDS is shown in Fig. 16.2:

The reader may wonder how the termination payments are settled in the case of a credit event. They can be settled either in cash or in physical form, again the agreement playing a key role. (a) In **cash settlements**, the protection buyer receives a cash payment proportional to the loss severity on the reference asset (i.e. initial value–recovery value). One problem with cash settlement is that there may not be enough market liquidity—or market price—in the reference asset to assess its recovery value in the midst of a credit event. (b) In **physically settled** cases, the protection buyer hands over the asset in (debt) default and receives its initial value in cash.



Fig. 16.2 Movement of Payments in a CDS

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Following are major areas where CDS can contribute towards reining in the portfolio credit risk:

a. Credit Risk Diversification: Diversification of portfolio credit risk is possible through CDS as it allows the transfer of credit risks associated with a credit asset to a third party. It is not uncommon for banks and FIs to partake in subscriptions to loans and other credit risk exposures in view of the long-term relationships with obligors. For instance, let us suppose that ABC Bank gets an invitation to participate in a bond offer by SATA Steel, a long-standing customer. But ABC Bank does not wish to increase its exposure in the steel industry. Neither does it want to annoy one of its main customers by declining the invitation. Such credit exposures are undertaken more out of obligation rather than any real risk appetite on the part of banks/FIs. ABC Bank may transfer the credit risk involved in additional SATA exposure to a protection seller through CDS. Buying protection through the CDS allows the lenders to reduce their credit exposures discreetly, without having to sell or assign the underlying loans or antagonizing valuable customers.

b. Buying Credit Risk: Conversely, there may be investors wishing to take on credit exposures to given names, but lacking the ability to acquire the necessary assets (due to competition, funding limitation, etc). Thus they are natural protection sellers. For instance, continuing the above-mentioned example, suppose XYZ Finance Corporation desires to take exposure with SATA Steel, but is hindered by competition or limited resources. It can, through a CDS deal, buy the credit risk it desires.

Example

BCD Ltd has a deposit base on which it pays, on average for 6 months, 4.8% interest. It being new and conservative, most of these funds are currently placed with other banks and FIs at 5%. It would like to diversify its portfolio but lacks a sufficiently broad customer base in the region to create a well-diversified portfolio.

PQR Bank Ltd. is a south-based bank with a large branch network in the south and in main cities across the country. A substantial part of the bank's credit portfolio is concentrated on loans and securities issued by southern government entities. These credit assets yield on average 7% p.a which it funds at 5.2%.

PQR Bank Ltd would like to reduce its exposure to government sponsored credits, but is not in a position to assign the loans to third parties. After negotiations, BCD Ltd. offers PQR Bank a CDS on the following terms:

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Operative date	:	01 January 2004
Term	:	5 Years
Notional amount	:	Rs. 100 crore
Early termination	:	20 days following the occurrence of a credit event
Termination payment	:	99% of the notional amount against delivery of equivalent par value of reference assets
Reference assets	:	Public Corporation Loans maturing 23 February 2005, coupon @7%, any other credits with similar seniority.
Protection buyer pays	:	6.52% p.a

In this transaction, PQR is the protection buyer and BCD is the protection seller. In fact both benefit. While PQR shifts the default risk of Rs. 100 crore, BCD obtains diversification without the hassle of marketing credit. Annually, 6.52% is to be paid to BCD Ltd. But note that PQR can retain 0.48% of it. A credit event to be specified triggers the payment. In this case only 99% of the notional amount will be paid. The credit event may be a default or adverse migration of rating or similar situations, which can be mutually agreed upon.

2. Total Return Swap

In this type of credit derivative one counter-party (total return payer) pays the other party (total return receiver) the total return of the underlying asset, while the total return payer receives a flexible (LIBOR etc.) rate-based return. Fig. 16.3 is a representation of a typical TR swap structure.

TR is a swap transaction in which a party agrees to pay the total return on a particular reference asset (such as a traded bond issued by a corporate), and agrees to receive a rate such as LIBOR, or possibly the return from another credit-sensitive asset. The total return includes any interest payment and capital gains over the swap settlement period. Usually there is no exchange of principal. So, a party holding a bond issued by a private borrower can promise to pay its total return, thereby stripping off the risk associated with credit downgrades or defaults during the life of the bond. Again, it is to be stressed that since there is no exchange of principal, that party still holds the risk of default on the final principal repayment. The party buying into the returns on the reference security is looking for those returns without buying the asset. Note that the market risk is not eradicated since movements in a broad, market rate such as LIBOR influence the payment of the other leg of the swap.

Part 4: CREDIT PORTFOLIO RISKS



Fig. 16.3 TR Swap Structure

Assume that a bank/financial institution lends to a major corporate through fixed rate debentures. The credit risk on the debenture, which is publicly traded, might be linked to the rating by an external agency. If the rating is downgraded, the market price of its existing fixed-rate debentures decreases. A bank/FI that purchases credit protection for these bonds using a total return swap would be compensated for the reduction in bond's value caused by such downgrades.

Like other types of swaps, total return swaps are commonly used:

- To get artificial exposure to asset returns in situations where it is either impossible or uneconomic for a party (total return receiver) to acquire the asset itself.
- To hedge an existing exposure to an asset (reference name) without physically having to dispose of the reference asset.

Example

XYZ Finance Ltd, a London-based institution specializing in fixed income bonds/ loans, wishes to acquire credit exposure to Japan quasi-government domestic bonds/loans. However, XYZ Finance Ltd lacks the administration systems necessary to originate or settle transactions in the domestic Japanese market.

Through enquiries, it is understood that ABC Bank offers a TR swap on Japanese credit assets.

The terms are as follows:

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Effective date	:	4 November 2004
Termination date	:	5 November 2006
Calculation amount	:	GBP 10 million
ABC Bank pays	:	Total return on the reference asset
Reference asset	:	Japan Savings Authority 8.73% (Yen-denominated bond maturing on 16 May 2010)
XYZ pays	:	GBP 6 month LIBOR + 1.40%
First LIBOR fixing	:	6.00%

In this case, XYZ is the total return receiver while ABC gets exposure to LIBORbased return in consideration. Both parties are happy because the TR swap enables them to get their desired positions. While XYZ undertakes credit exposure in the Japanese market, ABC enjoys diversification. [As a corollary it may be noted that XYZ gets a fixed rate in Japanese Yen while ABC is exposed to floating LIBOR-based rate. This means both are exposed to foreign currency movements while ABC returns are subject to the LIBOR movements as well. However, these issues are not linked with credit and hence let us assume that the foreign currency/LIBOR movements are acceptable to both parties.]

3. Credit Option (CO)

A call/put option represents the right, but not the obligation, to buy/sell. CO is a credit derivative that applies the principle of option to reduce credit risks. A CO allows the protection buyer to be protected against any credit loss arising from any pre-defined credit events. If the credit event does not occur during the contracted period, then the protection buyer lets the option lapse. However, on the other hand, if a credit event is triggered, the protection buyer seeks compensation (termination payment) under the option. In exchange for these benefits and protection, the protection buyer pays a fee upfront, known as premium. It is similar to CDS, with one major exception. While in CDS the protection buyer makes a series of fixed payments, in Credit Option, the payment is upfront in full and the option period is usually lower than that of CDS. Credit event and termination payment calculations are on the lines of the CDS.

4. Credit Spread Options (CSO)

CSO is an option on the credit spread or one that provides protection to the credit spread. CSO is appropriate in situations where the credit spread is a matter of concern.

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Often, the credit spreads changes with the credit risk. A bond downgrade will result in the fall of its prices, leading to losses to bondholders. An investor who believes that a corporate credit rating may change, thereby affecting its credit spread over another benchmark rate (say bank rate), which in turn will affect the face value of the credit asset (say debenture) can use CSO. The protection seeker/buyer can buy a call option credit spread call option—to mitigate the risk of a credit upgrade/downgrade. The option buyer pays a premium, either in lumpsum, or amortised over the term of the option. In turn, the option seller agrees to make compensate or effect payment of a specified sum in case the credit spread (of the credit asset) moves over the agreed threshold. For example, XYZ Mutual Funds have investments in fixed-rate corporate bonds. A rise in interest rates will reduce the market value of the bonds, which, in turn, will mean losses when the bonds are marked to market. The fund manager can cover this risk through CSO–buy an option which will compensate the fall in portfolio value if general (bank rate) interest rates increase.

5. Credit Default Linked Notes (CDLN)

In CDLN, funding is involved. It is nothing but CDS with movement of funds between the protection seller and protection buyer. The main differences between this type of credit derivative (linked notes) and other derivatives discussed so far (TRS, CDS etc) are:

- a. In the case of the former, the principal (either in full or at a discount/premium as mutually agreed) is moved. As a rule of the thumb, it can be stated that whenever a credit derivative is mentioned with words 'Linked Note' it means funds movement between the parties is involved, at the beginning of the contract itself, equivalent to the principal, either at par/discount/premium. In normal credit derivatives, no principal movements are involved.
- b. In 'linked notes' if there is no default, principal is returned on maturity and in case of default either the entire principal/major part of it is not returned. On the other hand, in non-linked derivatives, there is no principal movement and the protection seller will compensate the buyer in case of default. On the other hand, if there is no default, the maturity date passes by without any sort of principal payment. The latter is more like insurance.

Similar to CDLN, there is Total Return Linked Note (not only returns are swapped but the principals as well). In fact there are various types of credit derivatives tailor-

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made to the circumstances, within the basic structure of derivatives—viz. options, forwards and swaps. Various types of credit derivatives can be structured to suit the needs at hand. The beauty of the credit derivative is its flexibility. It allows creativeness and ability to apply fresh ideas. The transfer of credit risk can be effected for the whole life of the credit asset or for a shorter/limited period. Either the entire credit risk or a part of it can be transferred. The delivery can be structured in an insurance form or like linked notes (i.e., with funding). Similarly, one derivative agreement may comprise one credit asset or a group of credit-sensitive assets. The flexibility is vast and depends upon the creativeness of the participants, with the sky being the limit.

Credit derivatives are yet to catch on in most nations, including India. However, it is only a matter of time before their waves reach Indian shores. Currently, Europe and the US account for 95% of the credit derivatives. Global credit derivatives transactions during 2002 exceeded USD one trillion, with some estimates putting the figure as high as USD two trillion. Credit Default Swap (CDS) was the mostly widely used credit derivative, which is expected to see the biggest rise in volume in the future as well.

16.4 VALUE @ RISK

Value at risk, or VAR, has become one of the major tools of modern risk management. VAR was originally developed in the US for managing *market risk* and *liquidity risk*. VAR has recently been broadened to confront credit risk as well, although its use in managing credit portfolio risk remains largely experimental.

Meaning of VAR

Value at risk is the result of the desire of financial world for a single number that summarizes risk. When one says the portfolio value at risk at 95% confidence level is 2%, it means in 95% cases, the portfolio cannot lose more than 2% due to a variety of risk factors, usually systematic in nature. As a corollary, in 5% cases the portfolio losses can exceed 2%.

In order to compute VAR, three variables are needed, which are derived from extensive observation, based on which data is compiled. For example, in order to predict the VAR of a currency portfolio comprising 5 currencies, the daily currency quotes should be observed for a specified time period, say three months or six months. Based on the data gathered, three statistical variables are needed.

- a. Mean
- b. Standard Deviation
- c. Fitting a normal distribution

With the help of normal distribution, it is possible to see the chances of portfolio losses expressed as a percentage (in or in value terms as well) of the total portfolio.

Exposition of VAR Principle

Let us suppose that ABC Finance Corporation has a portfolio consisting only of marketquoted credit (bonds, debentures, etc.) assets. Let us call it a Marketable Credit Portfolio with an original cost of Rs. 500 million. The return of the various components of the portfolio is ignored because we are now interested in the risk of capital only. The last 120 days' movement in the portfolio value (based on the daily market values/prices of portfolio components) was observed. The mean variation of the portfolio value during this period was -0.005% and there was a standard deviation of 0.75%. Since this mean is not significantly different from zero, we can fit a normal distribution with mean zero and standard deviation of 0.75%. It will look as depicted in Fig. 16.4.

With the help of a standard normal probability distribution table, one can compute the probability of the bond market's movement in both quantum and direction. Statistically, 1.65 standard deviation (SD) can tell the portfolio value with 95% confidence. It means the portfolio loss will not exceed 1.65 SD of the portfolio. Accordingly, we can be quite certain that in 95% cases the maximum loss of the portfolio would be $1.65 \times 0.75\% \times \text{Rs}$. 500M or Rs. 6.2M (or 1.24% of the portfolio). In other words, the probability of the value of the portfolio falling by 1.24% is just 5%. In other words, the **Value At Risk** at 95% confidence level is 1.24%. In the same manner loss at 90% confidence level can be measured. However, usually 95% and 99% confidence levels are measured. In this manner, by mapping the observed market movements into mean and standard deviation and superimposing normal distribution, VAR can be computed. This provides a single number that summarizes the volatility (risk) of the portfolio for a desired confidence level.

Drawback of applying VAR to Credit Risk

VAR ascertains the maximum loss that may occur in a portfolio over a given time period, with a given level of confidence. VAR basically depends three variables: (a) Daily price and (b) Its volatility measured by standard deviation and (c) Fitting a normal distribution.

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Fig. 16.4 Noramal Distribution applied to Marketable Credit Portfolio

But in the case of non-tradable credit portfolios, when VAR is calculated, the following limitations may impact its usefulness:

- a. Daily price or current market value (CMV) of the loan is not directly observable as in the case of market securities, because loans are not traded. Hence a price or market value distribution is not available.
- b. Since CMV is not available, the volatility measurement is difficult.
- c. Normal distribution is an approximation even in the case of market securities. In the case of loans, the assumption of normal distribution tends to be even more of wild approximation.

Nonetheless some credit risk models do make use of VAR by finding appropriate (near approximate) variables to circumvent the drawbacks mentioned above. One among them is Creditmetrics[™], which is widely used in international banks and financial institutions, among others. It uses the rating of the borrower, changes (migration) of rating, credit spreads in bond market, etc., to link volatility, risk and distribution.

VAR, as a portfolio credit risk mitigation tool, provides the risk manager with the most valuable information. It can predict the risk, thus enabling risk managers to view different portfolio mixes and later adopt a portfolio mix that provides an acceptable VAR.

16.5 BUYING AND SELLING OF CREDIT ASSETS

Portfolio risks can be mitigated by buying credit in desired sectors, regions or asset classes, and selling credit in undesired areas. While loans trading is gaining popularity and

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already has an established secondary market in certain specific segments (e.g., syndicated loans), non-recourse factoring transfers credit risk to the factor, which normally in India is a bank or banks' subsidiaries. Depending upon the credit quality, the credit asset (under loan trading) is either offered at a premium or discount. Normally, the non-recourse factoring is at a discount to the face value of the credit. The rate of discounting varies primarily according to the credit risks involved and market rate of risk-free return. Although the non-recourse factoring is normally considered a liquidity enhancing technique, its corollary is that it can be used to get rid of undesired credit exposures if a willing factor can be identified, thereby adjusting the portfolio mix.

IIIII. Credit Pricing

PART FIVE



Pricing Basics

Have you ever approached banks or financing companies (vehicles or otherwise) for credit? Or have you ever been approached, in your capacity as an executive of a bank/financial institution/manufacturing/trading entity by a prospective credit seeker (borrower) for credit? In both cases, you might have either asked or been asked the question 'What is the cost of credit—viz. interest rate charged on the credit?'

After establishing the acceptability of creditworthiness, the next main concern is to determine how much return can be generated from the credit risk underwritten. Pricing of credit risk is gaining more attention, especially because of the factors we have discussed in Chapter 1. Moreover, pricing of credit is essential for the survival of enterprises relying on credit assets, because the benefits derived from extending credit should surpass the costs.

17.1 CREDIT PRICING IN NON-FINANCIAL INSTITUTIONS

The pricing of credit in non-financial institutions is not as extensive as in the banks and financial organizations. As we have seen, the major profit element emanates not from the credit facility, but from the underlying manufactured/traded product or service rendered. Credit is only a facilitating tool to push the product.

Nonetheless, unless the credit facility is appropriately priced, the business will suffer because the credit assets (viz. receivables/debtors) are created by deploying capital, which, in turn, has a cost. Accordingly, the cost of capital plays a major role, influencing the pricing of credit in a non-financial enterprise. If higher credit period is involved, companies usually load the cost of capital into the sales price, and offer discounts if paid in

Part 5: CREDIT PRICING

advance. Hence, in most cases, the cash discounts offered by the business world to speed up the collection can be viewed as the forgoing of the interest factor already loaded in invoicing/billing. Similarly, sometimes, where collection risk is on the higher side (habitual delayers), the companies tend to quote higher selling prices, which reflect the pricing of credit risk involved therein. The motivation to quote higher price emanates from the higher credit risk involved.

17.2 CREDIT PRICING IN FINANCIAL INSTITUTIONS

The very survival of financial institutions and banks depends on adequate pricing of credit. With the introduction of capital adequacy norms, the credit risks are linked to the capital—minimum 8% capital adequacy. Consequently, higher capital is required to be deployed if more credit risks are underwritten. Additional capital, when raised to take in more credit risky assets, will translate into additional efforts to improve/maintain share-holder returns. The decision (a) whether to maximize the returns on possible credit assets with the existing capital or (b) raise more capital to do more business (seek more credit assets), invariably depends upon pricing. Pricing must commensurate with the risks. It is essential for banks and financial institutions to ensure that the credit risks are not only thoroughly analysed and mitigated, but also priced adequately.

17.3 PRICING STRUCTURE

Interest on advances being the main source of a financial institution's revenue, the credit executives must ensure that the rate of interest on credit provides a satisfactory return. However, usually there are other accepted ways of deriving income (usually one-off) other than interest income, which is intended to remunerate the financial institution for services, whether connected with the credit or not. Following are the major sources of income, which determine the pricing:

- 1. Interest rates,
- 2. Commission,
- 3. Fees.

Interest Rates

As we have seen in the first chapter, interest represents the time value of money, the compensation for forgoing other opportunities of deployment and consideration for

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accepting credit risk. Banks apply interest on all credit facilities while non-financial entities load the interest factor in the price of goods/services, if they are sold on credit. Banks and FIs charge interest, based on the base rate of the country concerned. Base rate is normally the minimum rate at which the bank would lend out its money or discount bills of exchange. Base rates are usually determined by money supply, central bank policies, demand for credit and internal factors among others. Therefore, they are subject to fluctuation.

Usually a margin is added to the base rate to arrive at an appropriate interest rate for the credit at hand. The margin varies primarily depending upon the credit risk. A lower margin is fixed for less risky advances while more risky advance attracts a higher margin. Usually the margin added to the base rate may vary from 1 to 10 percentage points over the base rate, depending on the credit standing of the customer and the nature of the credit. International credit by multi-national banks and similar institutions is often quoted by reference to LIBOR*, which reflects the general level of interest rates in the global money market.

Fixed or variable interest rate

Usually interest rates are fixed by adopting a fixed interest method or a variable interest method. A **fixed rate** of interest is one that is applied right throughout the life of the advance. Changes of the base rate do not affect fixed rates. For example, if the loan is extended @10% fixed rate for five years, this rate remains, whatever happens to the base rates. The interest is deducted from the proceeds when the advance is granted (e.g. in the case of a bill discounted). Alternatively the total interest is added to the amount advanced, which is then converted into equal instalments agreed between the lender and the borrower (e.g. in the case of most personal instalment loans and hire purchase finance). Or, the interest is recovered at maturity alongwith the principal.

A **variable interest** rate is fluctuating and moves with the base rate. Since there is uncertainty as to the interest rate, the charging of interest on the outstanding amount of the advance takes place periodically, e.g. monthly or quarterly. For example, if a loan is granted at 2% above base rate and the current base rate is 8%, the interest rate is 10%. If the base rate changes to 9%, the interest rate will automatically increase to 11% (i.e. 9% + 2%).

^{*} LIBOR=London Inter-Bank Offer Rate.

Commission

Commission is the charge collected on services rendered to customers. It is computed either as a percentage of the total amount or on the basis of the quantum (viz. number of times) the services are provided. For instance, when the bank negotiates a bill or collects a cheque, the commission is charged for the services, although no actual credit is extended. While this does not directly impact the cost of a loan, if large transactions generating substantial commission income exists, many financial institutions and banks do offer some concessions on credit, provided creditworthiness is at acceptable levels. Normally the commission or fee covers the administration cost involved in the transaction, plus an element of profit.

Fees

Fees are charged to customers for the services rendered or facilities provided. For instance, credit facilities (in the form of overdraft, loans, etc.) may be provided by the bank to a customer as a standby arrangement, and the customer, being cash-rich might not utilize the limits. In such cases, a fee is usually charged by the bank to compensate the efforts and earmarking of funds (in certain cases) for the customer. For example, a commitment fee may be charged upfront on the full amount for the full period or it may be charged in arrears on any unutilised portion of the facilities extended. Usually, commitment fees are collected in arrears and it is discretionary on approving authorities to decide whether or not to apply commitment fees or not.

Similarly, arrangement fees are usually applied to situations where a great amount of time and work is required to review finance information, project and cash flow forecasts, security arrangements, etc. Examples are large loans, syndicated facilities, project finance, etc. However, an arrangement fee is also levied in the following instances: (a) Urgent request for facilities requiring extra effort by the credit executives and approval authorities to evaluate the proposal immediately (b) Restructuring of facilities e.g., re-scheduling loan repayments and (c) Frequent requests for amending the facilities. Arrangement fee is usually applied on the size/amount of the facility.

Processing fees, management fees, extension fees, amendment fees, etc., are some of the fees charged by creditor enterprises, while making credit available to the customers.

17.4. CREDIT RISK Vs RETURN

Institutions and enterprises which extend credit, anticipate return. While considering credit risk pricing, credit executives should ensure that the credit risk is not only thoroughly analysed and understood, but also priced adequately. Fig. 17.1 captures the relationship:

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Fig. 17.1 Credit risk and Return pattern

The relationship between credit risk and return ought to be recognized not only at the firm level but at the portfolio level as well. Two important aspects of credit risk and its relationship with return are discussed below:

a. In credit, the upward potential of return is limited. The rate of return, usually expressed as interest rates—whether fixed or floating—is predetermined and it is almost impossible to record substantial increases. Even in the case of floating rates, the interest rate increases by a few points, fully correlated to the changes in base rate. So, compared to their counterparts in equity capital or venture capital, the providers of credit capital cannot enjoy much on the upside of a borrowers' performance. Given this limitation, the risk taken by the suppliers of credit should be much less. A thorough application of the EIIF model can accomplish this. As we have seen in Chapter 1, if a creditor bank/FI enjoying an interest margin (net spread) of 2%, and suffers a credit loss of USD 1M, it will have to deploy USD 50M to recoup the loss. Hence, suppliers of credit ought to be very wary while investing in a credit asset.

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b When a credit asset is created, it involves investment of funds or capital, which in turn results in cost of funds/capital. Hence, the return on credit should not only cover the cost of capital and related admin charges but leave sufficient margin to satisfy the shareholders as well. Cost of capital is one of the important considerations to be taken into account while pricing credit risk. There are other factors also to be considered, which will be discussed later. But capital is more critical, especially in regulated bodies such as banks. As per the capital adequacy norms, differing credit risk requires different amounts of capital. If more capital is required for a particular credit asset, naturally the associated cost of capital (in absolute terms) will also be higher, requiring more return. In the case of banks, it is clear as the new Basel Accord necessitates more capital allocation for higher credit risks. (*Refer to Chapter 13 for the table that shows differing capital requirements under Standardized Approach, for varying credit risks.*)

17.5 OTHER FACTORS IN PRICING A CREDIT

While the major factor in credit pricing is the risk involved, there are other ancillary factors that also should be taken into consideration for credit pricing. They are briefly discussed below:

- 1. **Cost of capital**: As stated above, both financial and non-financial institutions deploy capital while extending credit, and the capital raised either from shareholders or otherwise, has a cost. The cost of capital deployed in credit ought to be covered by the pricing of the credit.
- 2. Overheads: Institutions have to spend time, effort and resources (including human expertise) to appraise, monitor and control the credit and related operations. The overheads are usually classified into two-direct costs and indirect costs. Direct costs are those which can be easily identified with a credit asset. Indirect costs are those which are more general in nature.
- **3**. **Sector**: Pricing should reflect the underlying risk associated with the sector. Certain sectors are more risky than others, and as a consequence the constituents of such sectors may become defaulters while the constituents of a stable sector will continue to perform well.
- 4. Borrower's past performance: Just because of a recent improvement in the financial performance of a borrower, one should not take things too

optimistically. In other words, the immediate past performance, along with current performance should be considered for pricing.

- **5. Security**: If appropriate and adequate security is offered as the mitigant to the credit risk, downward adjustments in pricing can be considered. Pricing should be negotiated upward in consideration of the discharge of an existing security or dilution of the bank's security position.
- 6. Ancillary business: In the case of adequate and compensating additional business in some other area, the creditor may relax pricing. For example, banks price credit under the loss-leader strategy, if the investment or foreign exchange income from a customer is substantial. Similarly, if the customer maintains substantial deposits with a bank, the bank sometimes extends interest-free credit facilities of small amounts.
- 7. Compliance with conditions/covenants or ensuring financial discipline: The terms and covenants of a credit facility may be structured in such a manner that in case of non-compliance, higher pricing will be triggered. This also reflects the higher credit risk involved because of non-compliance.
- **8**. **Inflation**: As we have discussed in earlier chapters, inflation eats into the value of a credit asset and hence it should be compensated through pricing.
- **9**. **Exit strategy**: Often, higher pricing of facilities is used as a strategy to cease dealings with a particular customer. Realizing that the price is higher than what is offered by competitors in the market, the customer prefers other suppliers. However, one important aspect to be remembered is that this strategy should be applied well in advance, before sharp deterioration in creditworthiness.

17.6 USUAL METHODS OF CHARGING INTEREST

a. Simple Interest

This is the most basic method of computing interest. The formula is very simple as is evident in the name:

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Interest = Principal \times N (Period) \times Rate of Interest
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Example: What is the interest payable on Rs. 1000 @10% for 90 days? Rs. 24.7/-

It is still used in practice, for example, in the case of staff loans offered by commercial banks.

b. Compound Interest

The issue of compounding emerges when the transaction will generate an interest annually (or periodically), which can be added back to the original amount (principal).

Example: Suppose interest at 10% on a 12-month loan for Rs.100 is compounded every 6 months (semi-annually). Since 6 months is exactly half a year, the compounding happens twice in a year. After the first 6 months, the repayable amount would be:

Repayment amount = $100 + (100 \times 0.10 \times 1/2)$ = $100 \times (1 + 0.10/2)$ = Rs. 105

The first Rs. 5 of interest is accrued after 6 months and is reinvested (rolled over), together with the principal, at the annual rate of 10% for another 6 months. So, after 12 months:

Repayment amount = $105 \times (1 + 0.10/2)$ = $[100 \times (1 + 0.10/2)] \times (1 + 0.10/2)$ = $(1 + 0.10/2)^2$ = **Rs. 110.25**

As evident, although the *nominal interest rate* is 10%, the *effective rate* is 10.25%, compounded semi-annually. Had the compounding been quarterly (every three months) the effective rate would be 10.38%. The reader may compute what would be the effective interest rate had the compounding been monthly. (Ans: 10.47%).

c. Discounted Method

Banks, when discounting bills, apply this method. The government also issues securities, such as Treasury Bills based on discounting concept.

Example: Suppose a bank receives a request to discount Rs. 1 lakh for 60 days @5%. The bank will, after discounting, release Rs. 99,167/-. In other words, the discount of Rs. 833/- is deducted upfront.

Let us see what is the effective rate of interest. It is $(833/99,167) \times 365/60 = 5.11\%$.

d. Add-on Method

Instalment sellers of consumer durables such as cars and home appliances usually employ this.

Example: Following are the terms offered for the sale of a vehicle by an auto-financier:

Amount	:	100,000
Int	:	10%
Period	:	3 years
Interest	:	30,000
Total	:	130,000
EMI	:	3611.11

The effective rate of interest is the IRR (Internal Rate of Return), which is calculated below:

IRR (-100,000) (3611.11 for 36 months).

Solving this we get monthly IRR of 1.49%, which means 17.9% per annum. Hence the *effective rate* of interest imbedded in the instalment financing is 17.9%, and not 10% as advertised.

Whatever methods are used, the effective rate of interest is the critical factor.

17.7 CREDIT RISK PRICING MODEL

Normally a financial institution, while pricing the credit, follows a model more or less similar to the one given below:

= Cost of funds + Overheads (salaries, etc) + Credit risk premium + Profit margin

When funds are raised for extending credit, the financial institution and other suppliers of credit do bear a cost. For instance, when a bank extends a loan, the necessary funds might have been obtained through customer deposits or raised interbank. In such cases, the bank has to pay interest on deposits, which is the cost of raising funds. This applies to non-financial institutions as well, because the funds blocked in the receivables do have cost of capital, which is usually the weighted average of cost of various sources of capital. In the case of banks and financial institutions, on certain occasions, the cost of raising funds will be substituted by the base rate/reference rate, obtained from the market.

The salaries and other overheads (stationery, communication, electricity expenses, etc.) related to the credit department (both front and back offices) are also to be recovered from the pricing.

Next comes the credit risk premium. We have seen that various grades have differing probabilities of default. The higher the credit risk, the higher the premium to be loaded into the pricing. One rough method is to factor in the default probability as the credit risk premium. The profit margin is the real earnings of the credit institution. All other variables discussed above cover the costs.

ILLUSTRATION

A business enterprise extending credit as part of its routine activity provides you with the following particulars:

- a. Funds are arranged from four sources amounting to Rs.36,650K, Rs.1,660K, Rs.374K and Rs.54K with annual rates of interest of 4.07%, 4.82%, 5.48% and 4.44% respectively.
- b. The credit department consists Credit Manager, Credit Analysts and Credit Assistants, drawing salaries of 300K, 200K and 100K respectively p.a. The number of transactions processed during a year is normally around 20,000. Overheads allocated to the department for utilities, postage, stationery, etc., stood at 300K p.a.
- c. The credit risk premium varies depending upon the grading assigned—Grade 1, Grade 2, Grade 3, Grade 4, and Grade 5 are charged a premium of 0.5%, 1%, 2%, 3% and 5% respectively.
- d. Normal profit margin is 2%.

A customer has been approved a credit of Rs.4000K under Credit Grade 3. What would be the pricing of this credit facility under following scenarios:

Case A: Assuming the expected transactions and requests processed through the credit department are 80 Nos?

Case B: The number of transactions is put at 20,000.

Case C: Assuming the Credit Risk Grade is 1—viz. very low credit risk.

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Solution

Case A

The credit pricing ought to be 9.86%. Calculation is given below.

Cost of Funds (Note1)	4.76% imes 4000,000	190,359
Overheads (Note 2)	80 imes 50	4,000
Credit Risk Premium	3% imes 4000,000	120,000
Profit Margin	2% imes 4000,000	80,000
Total Price of Credit		394,359
Credit Pricing (%)	(394,359 / 4000,000)	9.86%

Case B

The credit pricing ought to be 12.26%. Calculation is given below.

Credit Pricing (%)	(490,359 / 4000,000)	12.26%
Total Price of Credit		490,359
Profit Margin	2% imes 4000,000	80,000
Credit Risk Premium	3% imes 4000,000	120,000
Overheads (Note 2)	2000×50	100,000
Cost of Funds (Note1)	4.76% imes 4000,000	190,359

Case C

The credit pricing ought to be 7.36% as evident from the following calculation:

Cost of Funds (Note1)	4.76% imes 4000,000	190,359
Overheads (Note 2)	80 imes 50	4,000
Credit Risk Premium	0.5% imes 4000,000	20,000
Profit Margin	$2\% \times 4000,000$	80,000
Total Price of Credit		394,359
Credit Pricing (%)	(394,359 / 4000,000)	7.36%

As evident from the above examples, the credit risk pricing is influenced by several factors. In a competitive market, the credit providers would attempt to compete on pricing as well. Competitive credit pricing can be offered by controlling overheads,

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number of transactions and profit margins and by the selection of lower risk credit assets. Although the cost of funds is usually determined by external factors, ability to identify cheaper sources of funds can also definitely lead to lower pricing.

Details	Amount	Cost	%
Source 1	36,650	1490	4.07%
Source 2	1,660	80	4.82%
Source 3	37,400	2050	5.48%
Source 4	5,400	240	4.44%
Aggregate	81,110	3860	4.76%
Overhead Costs rel	ated to Credit		
a Salaries in Cred	it Function		Period 201x

a. Salaries in Credit Function		Period 201x
Credit Manager	300	
Credit Analyst	200	
Credit Assistants (100 $ imes$ 2)	200	
a. Total Salary		700
b. Overheads apportioned		300
Total Costs	<i>(a)</i>	1000
No. of credit requests handled	<i>(b)</i>	20,000
Hence cost per credit request	a/b	50



Pricing Methods

What method should be adopted while pricing a credit? If the price is too high, good quality credit would be hard to come by. On the other hand, if the credit risk is underpriced, not only does the value addition suffer, but it also means the risk underwritten is not appropriately compensated for.

Pursuing risk-adjusted profitability is a tough job. Nowhere is this harder than in large corporate lending, where, by most accounts, adequate risk-adjusted returns are hard to achieve, given the competition in the market for creditworthy accounts. To control credit risk exposures while ensuring adequate return to shareholders who have risked their capital (in creating credit assets), institutions must accurately measure the value delivered by a loan, bond, or any other credit contract.

Most institutions today use rudimentary credit risk pricing procedures. The consequence is that the credit providers originate or acquire many credit assets that they shouldn't, while turning down those they should have accepted. The basic pricing model, described in the previous chapter, that stresses the recovery of costs and a reasonable profit for the shareholders, can be applied by different methods discussed below, starting with RORAC.

18.1 RORAC-BASED PRICING

RORAC (return on risk-adjusted capital), also known as RORA (return on risk assets), RAROC (risk-adjusted return on capital), or ROCAR (return on capital at risk) attempts to link the returns to the underlying risks involved. The basic principle of RORAC is that not all assets are equally risky. First the assets are converted on the basis of the risk involved. Then the return on risk assets is calculated by using the following formula. RORAC may be defined as being the percentage net return on risk assets deployed.

RORAC = Net profit before tax (or net return) / Risk Assets

The relevance of the RORAC method lies in the fact that all business organizations attempt to maximize the return to the shareholders, but the risks taken should be reflected in the returns. This means that as far as possible, a business should go in for acceptable levels of credit risks, which provide maximum return on capital. If the business follows a predetermined leverage ratio, it can maximize the ROE by maximizing the return on risk-adjusted assets. It has two advantages: (a) The return is always commensurate with the risk and (b) The leverage can be maintained so that it does not spiral out of control. RORA refers to the return on *weighted risk* assets and not the return on gross assets. Let us exemplify the concept of RORAC:

We know ROE = ROA (Return on Assets) × leverage

Since the credit risk of each asset is different and enjoys different credit grades, ROA is modified by weighting it with different weights depending upon the credit risk involved. As we have seen, under the Basel Accords credit risks are weighted at 100%, 150%, 50%, etc. Having done this, Return on Risk Assets (RORA) is calculated by using the following formula:

 $ROE = RORA \times leverage$ = (Net Return / Risk Assets) × leverage

While ROA measures the net return on asset base, RORAC (or RAROC or ROCAR or RORA) measures the net return differentiating the assets based on the risks involved. The most critical part is the accurate measurement of the risk involved in an asset. (We have already discussed how banks differentiate the risks of various categories of assets.) In the case of banks with capital adequacy of 8%, the ROE = RORAC × 12.5 (RORAC / 8%). Assuming no change in leverage, what should be done to maximize ROE—viz. shareholder returns? Maximize the RORAC or RORA.

Example

ABCD Bank has two asset choices (let us call them Credit Asset A and Credit Asset B) to deploy Eur one million. Capital adequacy is 8%. Net final return from both credit

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assets is estimated to be the same—Eur 15K. However, risk weighting is different— Credit Asset B requires 50% weighting, while Credit Asset A requires 100%. (a) Compare the return of both credit assets (b) If both are not equally attractive, suggest steps to improve the less profitable credit asset so that both are equally attractive.

Solution

Calculation of RORAC on Credit Assets A and B:

Particulars	Credit Asset A	Credit Asset B	
Loan Amount (d)	1,000,000	1,000,000	
Risk asset weight	100%	50%	
Risk Asset Amt (a)	1,000,000	500,000	
Capital Employed (b)	80,000	40,000	
(8% of Risk Assets)			
Net Final Return (c)	15,000	15,000	
Return on Assets (c/d)	1.50%	1.50%	
Return On Risk Assets—RORA (c/a)	1.50%	3.00%	
Leverage $-1/8\%^*$ (e)	12.5X	12.5X	
ROE (c/b) or (RORA*e)	18.75%	37.50%	
* reciprocal of capital adequacy ratio			

Comments

From above, it is evident that from the net return point of view there is nothing to choose between Credit Assets A and B. However, when ROE is taken into consideration, the latter scores over the former. This, in turn, can be traced to better RORAC of the Credit Asset 2. Moreover, the capital employed in the latter asset is lower because of 50% weightage. Another corollary impact of the rule is that the lower the credit risk, the lower capital required, and vice-versa. In this case, the preferred credit asset is the second one—viz. Credit Asset B.

Change the pricing in such a manner that the net return of the Credit Asset A is doubled so that ROA becomes 3% is one suggestion to make Credit Asset A as attractive as Credit Asset B. From the credit risk pricing model discussed in the previous chapter it can be achieved by controlling costs or increasing the risk premium or margin. In other words, we know Cost of credit / Credit risk pricing = Cost of raising funds + Overheads (salaries, etc) + Credit risk premium + Profit margin. Accordingly, net return can be improved by

reducing cost of raising funds/overheads or by increasing the premium or margin itself. Another alternative is to reduce the risk weighting to 50% by asking for appropriate risk mitigants.

18.2 PRICE DETERMINATION BASED ON MARKET (OR MARKET-DRIVEN PRICING)

Basically the forces of demand and supply exert influence in the credit market also. In this case, the credit institution is highly influenced by the pricing of competitors. Usually the suppliers of credit offer homogenous products and the competition does exert pressure on pricing, which is a common phenomenon in almost all countries which follow relatively free market policies. The market should be respected in negotiating credit and loans in an increasingly competitive credit/loan market. Most participants in the large corporate market focus primarily on the credit spread and fees offered and less on subtle structural features. Because of this, many bankers often ask why they need a pricing model when the market sets the price. Most of the creditworthy customers usually invite price quotations from different credit providers before arriving at a final decision. However, blindly following the market carries the risk of inadequate pricing. While the market is important, cost and credit risk factors and related premiums are also vital.

Another technique is to follow a broad band pricing (going rate policy) with the competitors. In this case, the pricing need not be exactly the same as that of the competitors, but fixed taking into account the factors we discussed in the previous chapter. However, the price charged won't be completely out of context with the market, and an inbuilt flexibility will be provided so that the price does reflect the market by linking to a market benchmark. For instance, the LIBOR is widely accepted as benchmark rate for pricing of most of the global credit and money market financial products.

18.3 ECONOMIC PROFIT-BASED PRICING

The basis of the concept of economic profit (and similar terms such as economic value added) is the result of the persistent search by the business community for a measure, which reflects the excess return they get for the risks they have undertaken. It is commonly accepted that certain investments are relatively risk-free while others are riskier. There is a lot of difference between investing in the fixed deposits of a reputed bank and owning stock or investing in a business.

Looking from an investor's point of view, the shareholders (investors) seek a better return for the risks they are taking and would attempt to measure it against some

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benchmark—say return on risk-free investments, commonly referred to as treasury bonds, govternment securities, etc. Another benchmark is the cost of capital, which is the minimum return expected by the shareholders. In simple terms the

Economic Profit = Normal Earnings Attributable to Shareholders - Cost of Capital

Either one rate of cost of capital can be applied to all credit assets of the enterprise or the costs of capital can be differentiated across various sub-portfolios. For instance, establishing costs of capital by business lines to differentiate between different levels of industry risk is possible. In the case of riskier sectors a higher cost of capital may be charged, while less risky sectors may be assigned a lower cost of capital according to the discretion of senior management of the business enterprise. In multi-national businesses, the cost of capital can be differentiated across countries as well. For instance, higher cost of capital can be assigned to credit assets in a country that enjoys lower international rating (say Moodys, Standard & Poor, etc).

Example

Suppose ABCD Bank has a customer who enjoys an overdraft and a letter of credit (at sight) of EUR 100M and 20M respectively. The net final return—after providing for cost of funds and all overheads—for the year is EUR 1.5M. Risk weightage of LC at sight is 20% while that of the OD is 100%. Cost of capital (being the minimum expected return) of share capital is 12.5%. In this context (a) Calculate economic profit (EP) and (b) What if the net return happens to just EUR 0.9 Million?

Solution

Particulars	Facilities	Risk Weightage	Risk Assets
OD	100	100%	100
LC	20	20%	4
Total	120		104
Net Final Return			1.50 M
Less: Cost of Capital (Working Note a)			1.04 M
EP			0.46 M

(a) Calculation of Economic Return

Part 5: CREDIT PRICING

Interpretation: The excess return (or value added) for the extra risk taken by the bank's shareholders is rewarded by the EP of SAR 0.46 M. The shareholders have been rewarded for taking the risk, as they have been provided with an economic profit in excess of the cost of capital.

If the net return is only Eur 0.9M, the economic loss suffered by the shareholders is 0.14M. In this case, steps should be initiated to improve credit returns, for which pricing model variables are to be effectively managed in such a manner that pricing results in an economic profit.

Working Note:

Risk Weighted Assets	$104\mathbf{M}$	
Capital Adequacy	8%	
Therefore, Capital required	8.32M	
Cost of Capital	12.5%	or SAR 1.04M (8.32 \times 12.5%)

All those companies which earn EP will command a premium in the stock market, as evidently such companies are highly profitable. From the operational side of any business, the concept of EP enables the decision-takers to focus/concentrate on really profitable opportunities which add value to shareholders.

18.4 COST-PLUS PRICING

All businesses are influenced by costs, and an enterprise extending credit is no exception. The credit production costs should be recovered so that the entity survives. The basic pricing model (given in the previous chapter) takes into account all the costs and adds a mark-up for profit. The attractiveness of this kind of pricing is that it is fairly simple and straightforward. It ensures that the costs will be recovered from pricing, provided unduly large credit losses do not occur, which is a function of proper credit risk analysis. However, the drawback is that it does not take into account the market needs.

Cost plus pattern is very evident in the pricing of private sector banks and public sector banks in India. The former usually has a higher pricing because cost of funds also tends to be on the higher side. Private sector banks usually have to offer higher rates to attract deposits. This naturally pushes up the cost base.

18.5 STRUCTURED PRICING

In this category, the same debtor will be charged differing pricing depending upon the credit. Each credit structure is priced differently. Two instances are given below:

- a. In the case of a manufacturing entity, if the customer provides guarantee or letter of credit, the pricing will be lower compared to the open credit terms. The reason is that in the case of the latter, the credit risk is higher and hence the pricing is higher. For example, the same customer, say XYZ Ltd, may purchase \$10M worth of goods @ \$120/- per piece on open credit for 90 days and another \$30M under LC at @ \$117/- per piece for 90 days' credit. The lower pricing in the latter case is due to the significantly lower credit risk involved.
- b. A bank may extend clean credit facilities at a higher pricing to the same customer who enjoys lower credit pricing for a secured facility. It is not uncommon that borrowers enjoy lower pricing for secured credit (e.g; finance leases/term loans covered by primary assets and collaterals) while clean credit (unsecured short-term loans) attracts higher pricing.

18.6 GRID PRICING

While structured pricing is applied to different facilities granted to a customer, grid pricing is with reference to the same facility. But the pricing is dissimilar because of a perceived difference in credit risk. Usually the grid is attached to compliance with certain conditions or covenants. It is clear from the example given below:

Credit Facility	Rs 100 crore		
Pricing (p.a)	If Net Borrowings/EBITDA (Covenant)	GTEE	w/o GTEE
	–greater than 3.5X	Base + 100bps	Base + 210bps
	–greater than 3.0 X but less than 3.5 X	Base + 80bps	Base + 210bps
	–greater than 2.5 X but less than 3.0 X	Base + 60bps	Base + 175bps
	–greater than 2.0 X but less than 2.5X	Base + 40bps	Base + 175bps
	–less than 2.0X	Base + 30bps	Base + 150bps

In the above example, credit risk pricing is the lowest when Net Borrowing to EBITDA is 2X or lower. As this ratio goes up, it implies increasing credit risk, which attracts higher

pricing. However, under conditions of satisfactory guarantee cover, the pricing is again differentiated.

18.7 NET PRESENT VALUE (NPV) PRICING

Currently, the NPV approach of pricing a credit is rarely used, but it makes sense theoretically. Under this approach, a credit contract is profitable as long as it provides a return in excess of the minimum required rate of return or market norms (e.g. risk-free interest rates, etc). The credit/loan inflows are discounted at a specified rate usually market rate/risk-free rate, adjusted to the underlying credit risk—to arrive at an appropriate net present value, which forms the basis for arriving at a host of decisions.

Two decisions taken under this category are given below:

- a. Pricing of credit. Choose a level of price that will result in a minimum specified NPV. If the NPV of the credit turns out to be negative, it is a rejection case unless the pricing is improved such that an acceptable NPV is reached.
- b. Choosing among various credit options. If many credit asset alternatives are available, choose credit exposures that provide maximum NPV, since it maximizes the shareholder return.

However, the use of the NPV technique to price the credit is reticent, with certain stumbling blocks such as: (a) Rating migration. As we have seen in the section on credit matrix, there is a probability that the ratings will undergo changes. This suggests that the grades connote different amounts of risk at different times. Different grading requires varying credit risk premiums, and hence it is not easy to anticipate smooth cash flows. (b) Option to pre-pay the loan could reduce the time frame (c) Performance-based grid pricing or structured pricing too make it difficult to predict the cash inflows (d) Loan covenants also add to the uncertainty, because, in the event of non-compliance, the lender or the creditor can demand repayment or charge higher pricing, depending upon the credit contract (e) The need of calibration on loss factors by collateral type, credit, spread volatilities by term, sector, etc.

18.8 RANPV (RISK-ADJUSTED NPV) PRICING

Many academics believe a break-through in NPV-related pricing techniques—especially Risk-Adjusted NPV—is where the future lies and that this may ultimately replace

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RAROC, which is currently in vogue in many financial institutions. RANPV is nothing but the NPV, which is arrived at by recognizing the underlying credit risk. One method of arriving at RANPV is to adopt discounting rates that vary according to the credit risk grades of the credit assets. Some of the advantages of RANPV over RAROC are that while the latter mainly looks at a one-year perspective, RANPV focuses on a period exceeding a year. Additionally, RANPV look at the market return while arriving at the present value of the future returns of a credit asset.

Influe The Last Line of Defence–Security

PART SIX


Security Basics

The year 1815 was a crucial year for Europe. It ended the first attempt to create a European Union (Empire) by Napoleon, who lost the Battle of Waterloo. Napoleon would have won, but for the last line of defence of Gen. Wellington. The Allied Army (English army under Gen Wellington and Prussian army under Gen Blucher) planned to put up a combined front against the French led by Emperor Napoleon, who was desperately trying to defend his empire. Napoleon stole a march on them and defeated the Prussian Army at Ligny and chased the English army. Left with no choice, Wellington withdrew his forces with an urgent request to Gen. Blucher to reunite with whatever remaining forces he had. Finally Napoleon engaged Wellington at Waterloo. The English army was so battered by the French, that Wellington issued an order to his men to pick up muskets from the battlefield or from dead soldiers and fight on. Somehow the last line of English defence held till the Prussian army contingent arrived, and the rest is history.

Likewise, in credit risk, if everything fails or is likely to fail, a creditor's last line of defence is the Security. If security too fails, credit loss is unavoidable. In the previous sections, we discussed how to defend against credit loss by ensuring that the credit facility will be repaid from the internal cash generation from the business. Analysis of external environment, industry, company, financials as well as study of systematic and unsystematic risks and techniques to mitigate both portfolio and firm risks are all intended to minimize credit risk and defend against possible credit losses. Still, creditors wish to have some kind of security as the last line of defence.

19.1 NEED FOR SECURITY

Strictly speaking, no security is needed in business lending if repayments are possible from internal cash generation. However, the cash generation is contingent upon several

factors and impacted by business risks and financial risks. While favourable changes that positively impact internal cash generation will result in better inflows, adverse changes will dry up the inflows, affecting the repayment capacity negatively. In such cases, the creditor needs some sort of security and better protection than the equity investor, who has the right to partake in the upside potential of business unlimitedly, whereas the creditor cannot partake beyond the agreed amount.

As we have seen in the earlier chapters, it is important that every good loan should stand on its own, i.e., repayment should be ensured from the activity for which the loan or credit is intended to be used. Even in consumption lending, the regular source of cash flows or income should be identified as far as possible. Hence, a good credit risk analysis calls for ensuring repayment capacity, ignoring the security aspect. If credit is to be granted against security in the knowledge that the security should be relied upon later to recover the debt, it is better that the credit is not extended in the first place. This does not mean that security represents bad credit risk, although it is true that inadequate credit risk can be covered by security. Security-driven credit (fully secured credit) does exist in the commercial world. However, the entire credit in an economy cannot be extended on a secured basis. Some of the credit risk will remain open. It is the responsibility of the credit provider to ensure that the credit risks are within manageable limits, because credit risk underwritten by the entire economy can have far-reaching repercussions. Even with security, the credit risk is not fully mitigated because there is a risk that the value of security can crash, just as Japanese banks who lent to real estate learnt the hard way in the 1980s and 1990s.

19.2 MERITS AND DEMERITS OF SECURITY

As has been discussed, every credit given to a customer involves a certain degree of risk due to unexpected events that might adversely affect his financial position. In cases where the credit analysis provides medium- to high-risk rating, the following advantages can be derived from security:

Advantages to the Creditor

- a. In case the primary sources of repayment dry up, realization of security provides recovery of interest and principal, either in full or in part.
- b. It ensures that the borrower will strive the maximum to ensure repayment as the borrower desires to take back the security.

c. Security ensures that the borrower has additional equity in the transaction sought to be financed.

Disadvantages

- a. Too much focus on security will result in lost business. Many kinds of credit are good even without any security, provided the cash flows are stable, adequate and strong. Asking for security in such cases will have the effect of driving away business to competitors.
- b. As discussed above, no security is foolproof. The value of security can fluctuate and may reduce in future, sometimes even falling below the credit extended.
- c. Some of the securities may require maintenance and insurance, which add to the costs of monitoring. The responsibility to ensure that the assets offered as security are being maintained properly ultimately rests with the creditor. The legal documentation should be perfect.

Advantages to Borrower

- a. While the borrower, being the person familiar with the business/transaction, is confident of successful utilization of the borrowed funds, the banker might not have been convinced about the intricacies. In such cases, a security can bridge the gap of understanding of business. And, with the passage of time, the creditor will become convinced about the borrower's business skills and develop more understanding about the business, at which point the borrower can obtain release of the security originally provided for.
- b. Security is a source of additional funds. The borrower may not be able to urgently liquidate his assets although he is in immediate need of funds. In such cases, offering the assets on hand as security will meet the objective. Borrowing from banks offering stock as a pledge or hypothecation and settling the borrowing on collection of debtors is an example.

Disadvantages to Borrower

a. Major disadvantage is that the creditor gets an interest in the asset offered as security, diluting the stake of the legal owner of the asset offered as security.

Once offered a security, there is a risk of the asset being taken over/liquidated by the creditor to settle the dues. Hence most borrowers attempt to obtain credit without security.

b. Once it is offered as security, often creditors are reluctant to part with the asset (e.g., land & building as collateral) and usually it requires heavy efforts to convince them.

19.3 ATTRIBUTES OF GOOD SECURITY

A good security is one which in case of need, enables the creditor to recover the dues in full—viz., both principal and interest. Accordingly, a good security should have the following five main features that would enable the creditor to realize it easily and recover to the utmost the amount lent, if the borrower defaults.

1. Valuation: The value of the security should be readily ascertainable and reasonably stable over the years, providing sufficient margin. The safest security for a creditor would be a cumulative fixed deposit with a reputed banking institution, because the value is not only certain but will increase, thanks to the accruing interest. On the other hand, quoted equity shares are not equally protective because of the risk of wild swings in the market price of shares, and hence sufficient margins are to be taken.

2. **Realizability**: If the security is not realizable or realizable only with much cost and trouble, it does not serve the purpose of security as it offers no worthwhile protection. A good security should be readily realizable in all conditions and transferable without undue cost or trouble. As far as realizability is concerned, quoted shares/mutual fund units are the best as they can be sold within hours on the stock exchange. But the sale of a house or other building usually requires longer period of negotiation.

3. **Marketability**: Although securities may be realizable, they may not be marketed easily. For instance, suppose a certain piece of plant and machinery is offered as security. Although the asset may be realizable, there is no ready market available like that of a quoted share. The creditor may have to advertise and use other marketing techniques such as inviting tenders to create demand. Wherever the marketability is difficult, appropriate margin of safety is to be taken.

4. **Margin**: As has been discussed above, a good security should provide a sufficient safety of margin. This will ensure that even if the value of the underlying security undergoes adverse changes, net realizable value — viz., net of realization expenses — remains sufficient to cover the amount of money lent plus any accrued charges.

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5. **Title**: Even if a security satisfies all of the above but the title turns out to be bad, then there is no use of the security. Hence, the creditor should ensure safe and unquestionable title without undue trouble or expense. Difficulties in ensuring a clear title differ from security to security. The legal pledge of shares is possible in a much simpler and cheaper manner than a legal mortgage of land and building.

19.4 SECURITY AND PRICING

The security position along with other variables (such as the underlying risk associated with the sector, the borrower's past and current financial performance, etc) should reflect in the pricing. For the release of existing security or dilution of the (bank's/FI's, etc) security positions, pricing may be negotiated upward. Higher pricing should be charged, wherever possible, by credit institutions for customers with incomplete security. This should incentivize the customer to comply with the security terms and conditions.

19.5 COVENANTS AS SECURITY

Covenants reflect the parameters within which the customer agrees to operate, and based on which the creditor effectively agrees to continue support. Covenants aim to prevent excess liabilities and borrowings and ensure creditworthiness by insisting that the key ratios are kept within the acceptable range of a healthy business. Given their contribution to prevent credit losses, covenants can be considered as part of security. Financial covenants also serve as a warning sign. If not complied with, they should trigger questions and investigations, highlighting what is wrong with the customer. They should also find an answer to the question, whether compliance can be ensured, going forward. The ideal time to introduce covenants is before the declining trends or a deterioration in the key financial ratios or figures, set in.

All covenants ought to have a purpose. The covenants should not be introduced for just for the sake of it. Covenants must have a specific aim—they should cover some risk. For example, a dividend restriction covenant is relevant if the company is liberal in dividends despite lacklustre performance and enhanced debt usage. Another example is the case where the enthusiastic entrepreneur undertakes constant expansion, even with short-term funds, causing a liquidity crisis. A covenant imposing maximum capital expenditure, which should not be exceeded without the prior permission of the bank/lender/creditor will provide the latter with a prognosis, based on which appropriate decisions can be taken, including advise to the borrower on how to structure facilities for the new expansion, without impacting the liquidity.

Action should be taken if a covenant is breached, e.g., call in the credit facility or increase the pricing. Any breach of covenants must be investigated and should trigger a review of the credit risk, if necessary through the reworking of entire EIICF and possibly higher pricing to reflect the higher risk and the breach. Negotiation and steps to remedy the breach of covenants are the corollary stages.

Examples of the usual covenants are given below:

A. Cash flow and profit and loss account-based covenants

1.	Return on capital employed	:	Ensure adequate profitability.
2.	Interest cover	:	Ensure ability to service the finance cost.
3.	Fixed charges cover	:	Ensure ability to service the lease payments, finance costs & other fixed charges.
4.	Dividend payout	:	To prevent excessive dividends.
5.	Directors/inter-company dues	:	To prevent excessive diversion of funds.
6.	Management fees	:	To ensure that debt commitments are met before management fees are paid.

B. Balance Sheet Covenants

7.	Net working capital	:	To ensure minimum long-term contribution from LT sources.
8.	Current ratio	:	To ensure adequate liquidity.
9.	Quick ratio	:	To ensure adequate liquidity, before factoring into the stock.
10.	DSCR	:	To ensure repayment capacity of the instalment and debt.
11.	Debt to equity	:	To prevent excessive total outside liabilities vs. net worth.
12.	Gearing	:	To restrict interest-bearing loans.
13.	Minimum TNW	:	To ensure adequate capitalization.
14.	Debt restriction	:	Not to raise debt without prior permission.
15.	Capital commitment	:	Future expansion and related large capital commitments, only with prior notice.
16.	External Debt/EBITDA ratio	:	Ensures adequate EBITDA generation vis-a-vis the debt.
C.	Monitoring Covenants		
17.	Periodic inspection	:	Allows the creditor to inspect the assets/books and records of the debtor.
18.	Periodic valuation	:	Covenants to value stock, buildings, etc., by an independent valuer/auditor.
19.	Periodic Management reports	:	Covenants to submit quarterly/semi-annually etc., accounts, status reports, aging, etc.

D. Assets Preservation Covenants

20.	Insurance	:	Agrees to insure the assets.
21.	Depreciation rates	:	Agrees to depreciate the assets to the satisfaction of the creditor.

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22.	Sale of assets	:	Agrees not to sell assets without the prior knowledge/permission of the creditor.
23.	Negative pledge	:	Not to provide any of the unencumbered securities to other creditors as security.
E.	Strategy		
24.	Ownership/Management	:	Agrees not to alter ownership/management without the prior knowledge/permission of the creditor.
25.	Acquisition/Divestments	:	Agrees to provide prior information/take permission before venturing into new acquisitions, divesting business units, etc.

If covenants are not complied with, technically the creditor could withdraw/exit from the credit. In the case of financial covenants, it should not be a specific breach of the covenant that initiates action, but rather the trend with regard to covenant achievement over time. For instance, a deteriorating D/E ratio, which has yet to constitute a covenant breach, should prompt the lender to initiate discussions with the customer about the worsening trend.

19.6 SECURITY VALUE AND SYSTEMATIC & UNSYSTEMATIC RISKS

We have seen that credit loss is a matter of migration, default and recoveries. Briefly it can be described as follows:

Credit Loss = Exposure – Recovery

Recovery invariably includes also the recovery by way of realization of security. However, business cycles and other systematic risks do impact security, especially the tangible assets provided. Collateral values are particularly sensitive to economic down-turns for three reasons: (1) The direct effect of systematic risk exposure (2) An indirect effect if distressed obligors cut back on asset/collateral maintenance and control and (3) An indirect effect if distressed creditors dump assets/collateral in fire sale liquidations.

One of the main reasons why margins are insisted upon when taking security is to tide over the these kind of risks. Not all assets offered as security would be impacted to the same extent. While shares and real estate are the most volatile, cash deposit is the safest, provided the credit and the deposit are denominated in the same currency. When collateral asset is provided to secure the credit, its value may fluctuate in accordance with the systematic risks. Accordingly, the recovery rate of the collateral

assets may also drop in an economic downturn, and in that case, the recovery will also suffer. As we have discussed in Chapter 16, due to this factor it is better if the credit portfolio does not have too much concentration of single type of collateral assets.

19.7 CREDIT RISK GRADE AND RECOVERY RATES

Often, the recovery rates of low credit quality firms, (viz., high credit risk) in case of distress, tend to be higher than the recovery rates of high credit quality firms. The reason for this paradox lies in security. That is, low credit risk firms must experience abnormally large negative shocks to enter the default region. In contrast, relatively high-risk firms are thrown into default by even slight declines in asset values. Accordingly, the creditor will be more conscious about the problems with the high risk credit and hence take appropriate steps including adequate security outside the business as a possible source of repayment in case of default. However, in the case of top-rated credit assets, it is human nature to take things lightly and often no additional security would be available. Consequently, the failure of such borrowers can result in more loss to the creditor. However, the pertinent factor is that if the top rating is assigned after a thorough credit risk analysis and confirmed through periodic reviews, there is little chance of being taken by surprise.



Tangible and Intangible Security

A creditor can take security in many forms, which can be broadly divided into two groups: Tangible security and intangible security.

20.1 TANGIBLE SECURITY

Tangible securities are, as the name implies, tangible—physical, real and in some kind of material form. They are the material assets of the borrower held in the creditor's name or possession, and in most cases they can be realized or sold at the creditor's discretion if the customer fails to settle the credit availed. Some of the major tangible securities are as follows:

1. Deposits (with banks, financial institutions, etc.)

Cash deposits are a very satisfactory form of security. Such deposits do not depreciate in value, and in case of default the creditor can realize the security without much hassle and legal expense. For example, a chairman of a company may place a cash deposit in an account in his own name to secure a credit extended to the company. If the cash deposits are with a third party, before disbursing the credit, a confirmation should be obtained that a lien over the deposit has been recorded and that the deposit funds will be freely transferred if required.

2. Stock and Shares

Shares quoted on a stock exchange can be sold easily, and are hence favoured by banks as security. Valuation can easily be obtained from the daily newspapers or from share

brokers. Given the volatility of the capital markets, a margin should be allowed to cover any future fall in their value. The quantum of margin will depend on the share's market performance, the standing of the borrower, the amount of the advance and the nature of the shares, e.g., a greater margin will be required for building contractors' shares than blue chips. Partly paid and unquoted shares must not be accepted as security. For the greatest protection the bank should transfer shares offered as security for advances, to the name of its nominee. By doing so the bank obtains a perfect title and can realize them in case of default by the borrower, even without his co-operation.

3. Property/Land

Land, buildings and other real estate properties are often used to secure credit facilities. Valuation by an approved valuer should done while a search should be made at the land registry to verify the borrower's title to the property and to check whether there are any encumbrances. A substantial margin should be allowed because, in case of default and forced sale, the property may not recover the full value since legal and other selling expenses would be deducted. A legal mortgage is the best way of securing an advance because it provides the power of sale upon any default. An equitable mortgage is created by a simple deposit of the title deeds by the borrower together with a memorandum of deposit in which he acknowledges that the title deeds are to be held by the bank as security for the debt/credit and agrees to execute a legal mortgage over the property if called upon to do so. Sometimes the creditor will insist on irrevocable power of attorney also, so that the security can be realized without resorting to complex legal action.

4. Goods

Goods may be taken as security for advances. In most cases, the security is not taken by accepting physical delivery of the goods, but by taking possession of the documents of title to the goods. Documents of title include bill of lading, godown warrant, delivery order and any other document used in the ordinary course of business as proof of possession or control of goods. A proper hypothecation or pledge is taken over the goods as well.

5. Gold Or Other Precious Metals

In most cases, the security is taken by accepting physical delivery of the goods. Gold and other precious metals are a very satisfactory form of security because in case of Chapter 20: TANGIBLE AND INTANGIBLE SECURITY

default the creditor can realize the security without much hassle or legal expenses. A suitable margin is required to be allowed to cover any future fall in their value.

6. Bank Guarantees/Letters of Credit

A guarantee is a written undertaking whereby a guarantor undertakes to pay if the debtor/ borrower defaults. There are 3 parties to a guarantee: 1) The creditor 2) The debtor and 3) The guarantor. The debtor has the primary obligation to pay the creditor. The guarantor only becomes liable to pay if the debtor defaults. Special care needs to be taken while extending credit against guarantees because the worth of a guarantee as a security depends on the financial stability of the guarantor. Hence, an evaluation of the credit-worthiness of guarantor is also needed. Therefore, only guarantees from first class banks are usually considered as tangible. Other types of guarantees are to be treated as intangible.

20.2 INTANGIBLE SECURITY

The main feature of intangible securities, as the name implies, is that they are not physical assets but generally represent the documented rights of action that are held by the creditor. These rights or documents are either issued in favour of or assigned to the creditor as security against the moneys lent. In case of default, the creditors can recover the outstanding amount by executing the rights under the document held. Major examples of intangible securities are:

1. Unregistered Charges

Usually, whenever assets are taken as security, the charge should be registered with a certain appropriate authority. For example, as we have seen above, equitable mortgage and legal mortgage when properly registered, are considered as tangible security. In almost all other cases, wherever the deposit of title deeds is not registered, it amounts to intangible security only. Unregistered charge provides some comfort, but does not provide protection to the extent of registered charges.

2. Assignment

An assignment is a transfer of a right on a claim (related to a sum receivable) to another person. The integrity and ability of the customer and the third party, from whom the

assigned payments are expected, are critical. Hence, the creditors should ensure the creditworthiness of the counter party (third party) from whom the sums are receivable. A legal assignment should be obtained with a notice of the assignment to the debtor in writing. Registration, if required by law, should be undertaken. The borrower should instruct the third party to pay the creditor all sums due under the assignment, and it is better for the creditor to have irrevocable assignments.

3. Letter of Comfort (LOC)

This is a letter from the parent company to the creditor advising that the facility is obtained with its knowledge and that it will see that sufficient funds are available with the subsidiary to settle the claims by the creditor. Often, the letter of comfort is legally enforceable. Letter of comfort is of two types—Weak Letter of Comfort and Strong Letter of Comfort. In the case of the latter, the support of the parent is more persuasive than in the former. Letter of comfort falls short of guarantee, and under LOC the creditor cannot claim payments directly from the parent co.

4. Letter of Awareness

Letter of Awareness is a letter from the parent company to the creditor, advising that it is aware of the facility granted to its subsidiary and confirming that it will maintain the shareholding at the current level in the subsidiary and will advise the creditor if there are any changes. It includes wordings as mutually agreed upon, which will cause the subsidiary to be operated and maintained in such a way as to be in a financial position to repay its obligations from time to time. This security is weaker than both guarantee and Letter of Comfort. However, by mutual agreement the letter of awareness can be made legally enforceable. The comfort is that the parent company, if highly reputed, once aware of the credit facilities availed by a subsidiary will see that the subsidiary functions properly in such a manner that the dues are settled.

5. Letter of Negative Pledge

Pledge is a delivery of goods or documents of title to goods by a debtor to the creditor as security for his debt or any other obligation. However, under negative pledge no delivery of goods or anything similar takes place. It is a pledge whereby debtor agrees that without the prior written consent of creditor, debtor will not (a) create or attempt to create or permit to subsist any mortgage, debenture, charge, pledge, lien or other encumbrance upon on certain assets and (b) issue guarantees and indemnities. Other promises, such as restrictions on borrowing or lending can also be incorporated as negative pledges.

20.3 METHODS OF TAKING SECURITY

The manner in which security is taken is important because unless it is properly taken, enforceability may not be possible. The creditor should get a good title, and the person offering security should have proper ownership. The methods of taking security are often characterized by whether the ownership or the possession of the particular security is transferred from the customer to the bank. In this context ownership and possession should be clearly understood. The person who has possession may not have the title, and vice-versa.

Ownership means that the person who owns a property has a legal right over it, i.e., he has the right of possession, the right to sell and the right to appoint a receiver. On the other hand, the owner can part with possession without surrendering ownership, e.g. by renting a house. Possession means that someone, although not the actual owner, has physical control of a property. Since he is not the actual owner, he has no right to give, sell or charge the property to anyone else. Sometimes the creditor bank may opt for the ownership of the security while on other occasions the creditor will be satisfied with the possession with or without the option to convert the status into ownership. Following are the four common ways of taking a security:

1. Mortgage

A mortgage is the creation of an interest in an immovable property as security for the payment of a debt or for the discharge of an obligation. The borrower is called "mortgagor" and the creditor the "mortgagee". So the mortgagor is the person who mortgages his property in favour of a party who has lent him money while mortgagee is the person in whose favour a mortgage is given. Usually land, building and permanent and unmovable assets are subjected to mortgage. Mortgages are of two types—legal or equitable mortgage. In a legal mortgage, the creditor acquires the ownership of the asset and gets it registered in his name. Possession of the goods may remain in the hands of the borrower (e.g. the mortgagor of property) or be held by the creditor (e.g. the mortgagee of shares).

On the other hand, in an equitable mortgage, the title deeds or certificates are merely deposited with the mortgagee but the ownership of the asset remains with the mortgagor. Thus, although the creditor is in possession of title deeds, he does not acquire ownership of the asset.

2. Pledge

When a borrower makes delivery of goods or documents of title to goods to the creditor as security for a debt or for any obligation, it is known as pledge. The borrower is also known as pledgor while the creditor is called pledgee. The pledged item is to be returned to the pledgor when the credit is settled. While the possession of the goods or documents of title to goods passes to the creditor, the ownership remains with the borrower. Usually, the pledgee has the right to sell the pledged item in the event of default.

3. Hypothecation

The main feature of a hypothecation is that the possession remains with the borrower while through an agreement the creditor gets a charge over goods, or over the documents of title to goods. The creditor can ask the owner of the goods to hand over possession when called upon to do so, which is often done in the event of credit default or non-compliance with credit terms.

4. Lien

A lien is the right to retain the property of another person until a debt due from the owner of the property (the borrower) to the possessor of the property (the creditor) is paid. The interesting part of the lien is that often there is no written agreement required to enforce it. A lien usually arises in the ordinary course of business without any express contract between creditor and debtor. But the creditor under lien usually does not have any power of sale. It is an informal form of security and usually gives the right only to retain possession. However, it can be agreed upon in writing, in which case the creditor can get the right to sell. Often a banker's lien on deposits provides a right of appropriation to settle a credit facility with or without reasonable notice to the customer, depending upon the terms of agreement.

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20.4 REALIZING SECURITY

While an express power of realization without reference to the borrower or to the person who has deposited the security should be documented in all agreements as far as possible, it is better (and ethical) to send a formal written demand for repayment of the credit plus interest and other charges. Normally, it is in writing and sent by registered post or other means where the acknowledgment by the debtor (or the one who provided the security) is ensured. If the customer fails to comply with the demand for repayment, one of the following actions may be taken as appropriate:

- 1. Sell any shares/properties mortgaged to the bank.
- 2. Invoke the guarantee held.
- 3. In the case of hypothecation, initiate steps to acquire physical possession of the stock of goods and raw materials.

In the event of floating charge (in debentures, etc) a court-appointed receiver may be needed. The most important aspect of realizing securities is to ensure that the best possible price is realized and not merely a sum sufficient to cover the debt. An independent valuation should be obtained before effecting the sale. Auction is a better route to dispose securities, and if planned, the reserve price should be set as high as possible to correspond with the current market value.

Once the goods/securities are sold, the proceeds of sale should be utilized to deduct the following:

- 1. The outstanding credit along with interest accrued, and other direct charges.
- 2. All legal fees and liquidation/realization expenses.

The amount that remains after meeting the above belongs to the debtor, and hence should be repaid at the earliest. On the other hand, even after applying the realization proceeds, if there is still an outstanding debt, appropriate legal action/arbitration may be undertaken.



Appendix A

CREDIT CREATION

Banks can create credit virtually out of thin air! This is because of the fact that the credit extended by the banking system, in most cases, comes back to the banking system. Of the deposits received, banks, after maintaining the legal minimum reserves (stipulated by Central Bank to ensure liquidity of the banks) can extend the remaining portion to the public as credit. Since the bulk of the monetary transactions are routed through banks, the amount extended as credit comes back to the banking sector as deposits, which enable the banks to extend further credit, although no additional currency has been printed. The following example illustrates the concept better:

Example: Mr A, Mr B, Mr C, Mr D and Mr E deal only with XYZ Bank Ltd, which is required to maintain 10% reserve ratio on deposits. On May 1, 2003, XYZ Bank received a deposit of Rs. 10,000/- and Mr A applied for credit on the same day. He was provided with Rs. 9,000/- after setting aside 10% as reserve ratio. Mr A used the credit to buy a TV from Mr B, who deposited the amount with XYZ Bank the next day. The bank kept aside 10% and extended credit to Mr. C who applied for Rs. 8,100/-, and used it to buy a stereo from Mr D, who too similarly decided to deposit the amount with XYZ Bank. The bank once again set aside 10% reserve on the deposit and lent Rs. 7,290/- to Mr E.

As is evident from the above, XYZ Bank was able to create three credit deals totalling Rs. 24,390/-(9,000 + 8,100 + 7,290) from a single deposit of Rs. 10,000/-.

Although the subsequent credit facilities get reduced because of 10% reserve requirement, it is evident that the bank can 'create credit' more than once from a one-time deposit! The chain of credit transactions and resultant deposits will continue until the Appendix A

reserve requirement makes it impossible to do further credit. In this case, by that time the total credit transactions of XYZ would add up to Rs. 100,000/- i.e., an amount exactly ten times as large as the original cash deposits of Rs. 10,000. The following table depicts the situation clearly:

Serial No.	Deposits	Reserves	Advances
1	10,000	1,000	9,000
2	9,000	900	8,100
3	8,100	810	7,290
4	7,290	729	6,561
5	6,561	656	5,905
6	5,905	590	5,314
7	5,314	531	4,783
n			
Total	100,000	10,000	90,000

The amount of credit the banking system can create with a single initial deposit, can be calculated using the following formula:

Credit Creation =
$$\frac{Intial \ Deposit \ (1-r)}{r}$$
, where $r =$ reserve ratio.

Although the exact credit creation by banks is determined by a variety of factors such as convention, central bank reserve requirements, general market conditions and demand for loans, normally banks can create credit to the extent of 5 to 6 times of their original deposits (500 to 600 percent).

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Appendix B

RATING NOTATION	MEANING OF THE NOTATION				
AAA+	Better than AAA				
AAA	Very Negligible Credit Risk				
AAA -	Not as good as AAA, but (merits a grading) better than AA+				
·					
AA+	Better than AA				
AA	Very Low Credit Risk				
AA-	Not as good as AA, but better than A+				
A+	Better than A				
Α	Low Credit Risk				
A-	Not as good as A, but better than BBB+				
BBB+	Better than BBB				
BBB	Satisfactory Credit Risk				
BBB-	Not as good as BBB, but better than BB+				
2					
BB+	Better than BB				
BB	Acceptable Credit Risk				
BB-	Not as good as BB, but better than B+				

	The McGrau	v·Hill Companies
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	R⊥	Better than B
-	B	Significant Credit Risk
_	В-	Not as good as B, but still better than CCC
_		
-	CCC	High Credit Risk
-	СС	Very High Credit Risk
_	С	Very Very High Credit Risk
_		
-	D	Credit Loss



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