

# Credit Risk Assessment and Evaluation System for Industrial Project

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**Abstract**—Most of the banks are interested to provide high quality financial aid, known as credit, to their customers to contribute to the growth of gross domestic product (G.D.P.) of the country. The traditional credit risk management technique is dominated by the lending risk analysis (LRA) manual introduced by the Bangladesh Bank and recently the credit risk grading (CRG) system has been introduced which is not appropriately structured for the case of funding an industrial project. So, to overcome the lacking of existing LRA and CRG system regarding risk assessment for industrial project, an improved risk assessment model for is developed which gives a complete solution for risk evaluation for any industrial project. The purpose of this paper is to provide a standardized risk assessment and evaluation system especially for funding industrial projects and also assist in the ongoing improvement of the banking sector in Bangladesh by adopting a standardized approach in the form of credit risk grading (CRG) system. The whole model is divided into six risk components and each type of risk is again divided into some criteria which are crucial risk determinants and further the criteria are scored against specific parameters in order to assess the final grading score. Beside this a case study of a reputed cement industry project is also conducted and the risk of the proposed project is successfully evaluated using the proposed risk assessment model.

**Index Terms**—Credit investigation, credit risk assessment, risk grading system.

## I. INTRODUCTION

Risk is inherent in all aspects of a commercial operation. However, for banks and financial institutions, credit risk is an essential factor that needs to be managed. Credit risk is the possibility that a borrower of counter party will fail to meet its obligations in accordance with agreed terms. Credit risk, therefore arises from the bank's dealings with or lending to corporate, individuals, and other banks or financial institutions [1]. Banks are committed to provide high quality financial services/products to contribute to the growth of G.D.P. of the country through stimulating trade

and commerce, accelerating the pace of industrialization, boosting up export, creating employment opportunity for the educated youth, poverty alleviation, raising standard of living of limited income group and over all sustainable socio-economic development of the country [2]. The failure of a commercial bank is usually associated with the problems in Credit portfolio and is less often the result of shrinkage in the value of other assets. As such, credit portfolio not only features dominant in the assts structure of the Bank, it is critically important to the success of the bank also.

Credit can be defined as 'A transaction between two parties 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)' [3]. 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. As purchasing power increases, people tend to spend more on consumer goods and this stimulates further economic growth [4]. Credit losses are the results of the ability and willingness to repay the credit. 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, mismanagement, death of key persons business cycles, over-ambitious projects, financial losses, excessive leverage, concentrated exposure, defective diversification and so on. Only a proper credit-risk analysis will bring to light the probability of credit loss arising out of genuine business factors and explore the possible mitigates regarding this ominous situation to put a check on it [5]. Credit risk can be defined as 'the probability of loss (due to non-recovery) emanating from the credit extended, as a result of the non-fulfillment 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 [6].

Credit risk management encompasses identification, measurement, matching mitigations, monitoring and control of the credit risk exposures to ensure that: the individuals who take or manage risks clearly understand it; the organization's risk exposure is within the limits established by Board of Directors (BOD) with respect to sector, group and country's prevailing situation; Risk taking Decisions are in line with the business strategy and objectives set by BOD; The expected payoffs compensate the risks taken; Risk taking decisions are explicit and clear and Sufficient capital as a buffer is available to take risk [7]. Elimination of credit risk is impossible as long as credit forms an integral part of the economy. The financial organizations should manage

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the credit risk in such a manner that it does not spiral out of control [8]. The goal of credit risk management is to minimize a bank's risk adjusted rate of return by maintaining credit risk exposure within risk inherent in the entire portfolio as well as the risk in individual credits or transactions [9].

#### A. Different Forms of Bank Credits

From the banker's point of view, credit is the confidence of the lender on the ability and willingness of the borrower to repay the debt as per schedule of the repayment. For this, banking is termed as business of confidence. Before allowing credit facility a banker should be satisfied that the applicant qualifies the following five essentials which may be termed as 5 Cs, namely- Character: borrower's integrity, honesty and intention to repay the loan money, Capacity: borrower's business ability, particularly profit making report, Capital: financial strength to cover a business risk, Conditions: it is general business condition, Collateral: borrower's ability to produce additional securities [7]. Commercial banks make advances in different forms. All types of credit facilities can be broadly classified into two groups: funded credit and non funded credit. Any type of credit facility which involve direct outflow of Bank's fund on account of borrower is termed as funded credit facility. Funded credit facilities may be classified into four major types: loans, cash credit (CC), overdraft (OD) and bill discounted and purchased. Other important funded advances/facilities are: advance against hypothecation of vehicles (transport loan), consumer loans, agricultural loan-farming and off-farming, weaving loan, micro credit, consortium loan, syndicated loan, lease financing, hire purchase, import financing (LIM, PAD etc.), export financing (packing credit, trust receipt etc.) etc [6]. Non funded credit facilities are primarily non-funded in nature but at times it may turn into funded facilities. As such, liabilities against these types of credit facilities are termed as 'contingent liability'. The major non funded credit facilities are: letters of credit (L/C), bid bond, performance bond, advance/payment guarantee and foreign counter guarantee etc [6].

The basic purpose of this paper is to explore and provide directional guidelines by preparing a proposed model needed to be adopted by banking sector that will try to improve: the risk assessment and evaluation process specially for funding industrial projects, assist in the ongoing improvement of the banking sector in Bangladesh by identifying the lacking in the existing credit risk assessment and management system and minimizing so by adopting a standardized approach in the form of credit risk grading (CRG) system and understanding the different aspects between financing an industry in their ongoing business and financing a project for a specific duration.

## II. CREDIT RISK ASSESSMENT

The objectives of credit risk management are to: minimize bad loans by improving the risk/return profiles of the portfolio, price credit risk adequately or risk based pricing, maximize benefits from potential credit opportunities, setting of concentration and exposure limits,

active portfolio management, adhere to credit policies and maintain and maintain a reliable database.

#### A. Credit Investigation

Credit investigation refers to the assessment of a loan proposal from different points of view to decide whether the bank should go for finance or not, i.e. the study of the borrower specially justifying credit status of the borrower. For selecting the borrower security should not be the only thing to be relied upon. So responsibility of the bankers to investigate the client from different view points i.e. the strength and weakness of the client so that the client will be able to repay the bank loan as repayment schedule with profit [7].

#### B. Sources of Credit Information

Credit information are collected from: Credit Agencies: dun and bradstreet (USA/India), CRAB (Bangladesh), CIB Bangladesh Bank: debtor's/ borrower information, owners information, group/ affiliation information, credit exposure matrix, third party guarantors information, Loan Application: client loan application and KYC, Market report: bankers can collect information about the client from businessman doing the same business, Study of the account: accounts turnover of the client of last one year, Confidential report, Default borrower list, Financial statements, Other sources: Press report, suppliers, tax papers etc, RJSC investigation etc., Clients personal interview [10].

#### C. Modern Concepts of Credit Investigation

Modern concepts of credit investigation cover a well developed loan proposal analysis from six points of view these are: Managerial aspect: sincerity, honesty, integrity, educational background, experience of the borrower and ability of the management to run the project efficiently. Organizational aspect: under what type of organization the activities will be undertaken. Whether it is sole proprietorship or partnership, private limited, public limited company? Technical aspect: location of the business, land and building, machineries equipment, requirements to be used like power, fuel, water, materials etc. Marketing aspect: marketability of the product to be produced projected sales volume, scope of market expansion, possible threat of competition etc. Financial aspect: total requirement of fund for the business activities and how much will be required as loan from the bank, borrowers contributions in the business, cash inflow and out flow statement, sales forecast, balance sheet, profit and loss account etc. Economic aspect: contribution to gross commercial product (GCP), creation of employment, indirect benefit of the society [11].

#### D. Preparation of Credit Report

A credit report contains: name and address of the client, nature of the firm and date of establishment, nature of business, investment in the business, subsidiary, net sales, annual net income, market reputation and means of finance particulars of bank account particulars of owner [6].

#### E. Selection of Borrower

Borrowers are selected considering the following factors:

Five Cs: Character, Capacity, Capital/ Credit worthiness, Condition (Economic), Collateral.

Five Ms: Man, Money, Materials, Market, Management

Five Ps: Person, Purpose, Product, Place, Profit.

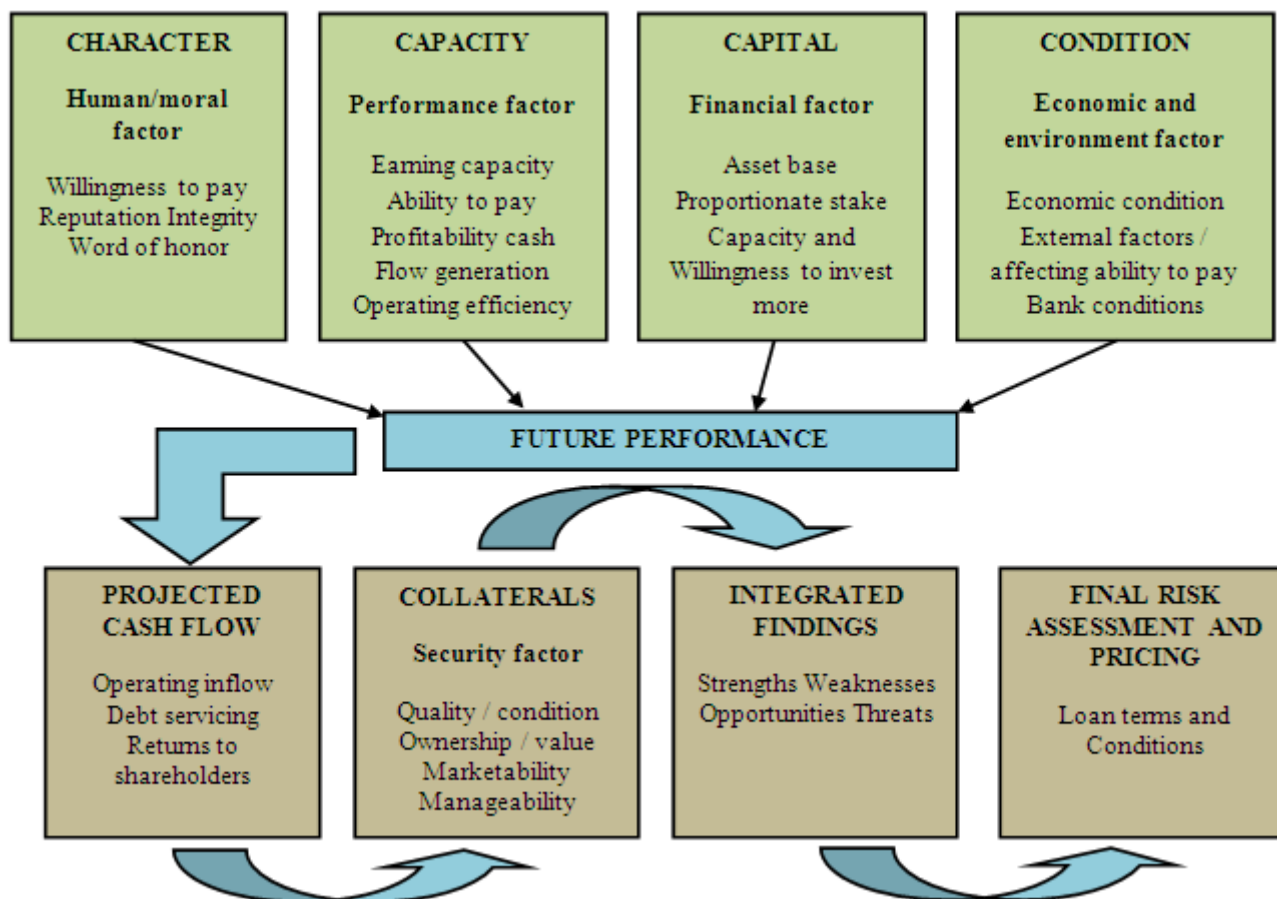


Fig. 1: Basic factors of credits

### III. CREDIT RISK GRADING SYSTEM

The credit risk grading (CRG) is a collective definition based on the pre-specified scale and reflects the underlying credit-risk for a given exposure. Credit Risk Grading is the basic modular for developing a Credit Risk Management system. Well-managed credit risk grading systems promote bank safety and soundness by facilitating informed decision-making. Grading systems measure credit risk and differentiate individual credits and groups of credits by the risk they pose. This allows bank management and examiners to monitor changes and trends in risk levels. The process also allows bank management to manage risk to optimize returns.

#### A. Existing Credit Risk Management System in Bangladesh

One of the most significant risks a bank is exposed to is what is generally termed as, 'Credit Risk'. Since the largest slice of income generated by a bank and a major percentage of assets are subject to this risk, it is obvious that prudent management of this risk is fundamental to the sustainability of a bank [12]. In 1993, Bangladesh Bank as suggested by Financial Sector Reform Project (FSRP) first introduced and directed to make the first regulatory move to introduce best practices in the Banking sector of Bangladesh under the caption "Lending Risk Analysis (LRA)" for all lending exposures undertaken by a bank in excess of Tk. 10 million.

The banking sector since then has changed a lot as credit culture has been shifting towards a more professional and standardized Credit Risk Management approach.

However, the LRA has got the following disadvantages of its own:

- The LRA manual suffers from a lot of subjectivity, sometimes creating confusion to the lending bankers in terms of selection of credit proposals on the basis of risk exposure. In other words, it lacks from objectivity.
- No post-sanction grading of the disbursed credit facility.
- No specific grading or scoring system for financing projects.
- LRA gives only the acceptance or rejection decision of a loan proposal i.e. whether to lend or not lend but no efforts have been undertaken for periodic grading for unclassified as well as classified loan accounts.
- LRA gives only single obligator grading/rating
- LRA does not provide any branch wise port folio grading.
- LRA does not provide the port folio wise grading system for the bank as a whole.
- With the world moving towards Basle II (which covers a) Minimum capital requirement which again involves 1) credit risk, 2) operational risk and 3) market risk, b) Supervisory review process and c) Market discipline) the need to introduce a risk grading system (RGS) for the industry is essential.
- LRA does not put emphasis on limit utilization.

- j) LRA lacks management Information System (MIS) on grading.
- k) LRA is only concerned with financial risk and security risk, but other significant risks such as business/industry risk, management, marketing and relationship risks, are not explored in LRA method.

#### IV. PROPOSED CREDIT RISK GRADING SYSTEM

To overcome the lacking of the existing LRA (Lending Risk Analysis) system outlined above with a view to creating a sustainable credit risk management culture, performance, environment and technique to render a need best simplified and user friendly model for application by the banks and financial institutions in processing credit decisions and evaluating the magnitude of risk involved there in a new strategy/system in the form of credit risk grading (CRG) is now going to be analyzed and overviewed. Credit risk grading suggested in this paper is going to be an important tool for credit risk management for industrial project as it is going to help the banks and financial institutions to understand various dimensions of risks involved in different industrial credit transactions. The aggregation of such grading across the borrowers, activities and the lines of business can provide better assessment of the quality of credit portfolio of a bank or a branch. The credit risk grading system is vital to take decisions both at the pre-sanction stage as well as post-sanction stage.

At the pre-sanction stage, credit grading helps the sanctioning authority to decide whether to:

- a) Lend or not lend
- b) What should be the loan price
- c) What should be the extent of exposure
- d) What should be the appropriate credit facility
- e) What are the various facilities
- f) What are the various risk mitigation tools to put a cap on the risk level

At the post-sanction stage, the bank can decide about:

- a) The depth of the review or renewal
- b) Frequency of review
- c) Periodicity of the grading and other precautions to be taken.

Having considered the significance of credit risk grading, it becomes imperative for the banking system to carefully develop a credit risk grading model, which meets the objective outlined above. Bangladesh Bank expects all commercial banks to have a well-defined credit risk management system, which delivers accurate and timely risk grading. In practice, a bank's credit risk grading system should reflect the complexity of its lending activities and the overall level of risk involved.

##### A. Number and Short Name of Grades Used in the CRG

The proposed CRG scale consists of 8 categories with Short names and Numbers are provided as follows:

TABLE 1: GRADES USED IN CRG SYSTEM

Grading	In Short
Superior	SUP
Good	GD
Acceptable	ACCPT
Marginal / watch list	MG/WL

Special mention	SM
Substandard	SS
Doubtful	DF
Bad / Loss	BL

##### B. Risk Grading and Risk Assessment

All Banks should adopt a credit risk grading system. The system should define the risk profile of borrower's to ensure that account management, structure and pricing are commensurate with the risk involved. Risk grading is a key measurement of a Bank's asset quality, and as such, it is essential that grading is a robust process. All facilities should be assigned a risk grade. Where deterioration in risk is noted, the Risk Grade assigned to a borrower and its facilities should be immediately changed. Borrower Risk Grades should be clearly stated on Credit Applications. The following Risk Grade Matrix is provided as an example. The more conservative risk grade (higher) should be applied if there is a difference between the personal judgment and the Risk Grade Scorecard results.

##### C. Risk Rating Grade Definition

*Grade 1 - Superior (Low Risk):* Facilities are fully secured by cash deposits, government bonds or a counter guarantee from a top tier international bank. All security documentation should be in place.

*Grade 2 - Good (Satisfactory Risk):* The repayment capacity of the borrower is strong. The borrower should have excellent liquidity and low leverage. The company should demonstrate consistently strong earnings and cash flow and have an unblemished track record. All security documentation should be in place. Aggregate Score of 85 or greater based on the Risk Grade Scorecard.

*Grade 3 - Acceptable (Fair Risk):* Adequate financial condition though may not be able to sustain any major or continued setbacks. These borrowers are not as strong as Grade 2 borrowers, but should still demonstrate consistent earnings, cash flow and have a good track record. A borrower should not be graded better than 3 if realistic audited financial statements are not received. These assets would normally be secured by acceptable collateral (1st charge over stocks / debtors / equipment / property). Borrowers should have adequate liquidity, cash flow and earnings. An Aggregate Score of 75-84 based on the Risk Grade Scorecard.

*Grade 4 - Marginal (Watch list):* Grade 4 assets warrant greater attention due to conditions affecting the borrower, the industry or the economic environment. These borrowers have an above average risk due to strained liquidity, higher than normal leverage, thin cash flow and/or inconsistent earnings. Facilities should be downgraded to 4 if the borrower incurs a loss, loan payments routinely fall past due, account conduct is poor, or other untoward factors are present. An Aggregate Score of 65-74 based on the Risk Grade Scorecard.

*Grade 5 - Special Mention:* Grade 5 assets have potential weaknesses that deserve management's close attention. If left uncorrected, these weaknesses may result in a deterioration of the repayment prospects of the borrower. Facilities should be downgraded to 5 if sustained



deterioration in financial condition is noted (consecutive losses, negative net worth, excessive leverage), if loan payments remain past due for 30-60 days, or if a significant petition or claim is lodged against the borrower. Full repayment of facilities is still expected and interest can still be taken into profits. An Aggregate Score of 55-64 based on the Risk Grade Scorecard.

*Grade 6 – Substandard:* Financial condition is weak and capacity or inclination to repay is in doubt. These weaknesses jeopardize the full settlement of loans. Loans should be downgraded to 6 if loan payments remain past due for 60-90 days, if the customer intends to create a lender group for debt restructuring purposes, the operation has ceased trading or any indication suggesting the winding up or closure of the borrower is discovered. An Aggregate Score of 45-54 based on the Risk Grade Scorecard.

*Grade 7 - Doubtful (non-performing):* Full repayment of principal and interest is unlikely and the possibility of loss is extremely high. However, due to specifically identifiable pending factors, such as litigation, liquidation procedures or capital injection, the asset is not yet classified as Loss. Assets should be downgraded to 7 if loan payments remain past due in excess of 90 days, and interest income should be taken into suspense (non-accrual). Loan loss provisions must be raised against the estimated unrealizable amount of all facilities. In all cases, the requirements of Bangladesh Bank in CIB reporting, loan rescheduling and provisioning must be followed. An Aggregate Score of 35-44 based on the Risk Grade Scorecard.

*Grade 8 – Bad and Loss (non-performing):* Assets graded 8 are long outstanding with no progress in obtaining repayment (in excess of 180 days past due) or in the late stages of wind up/liquidation. The prospect of recovery is poor and legal options have been pursued. The proceeds expected from the liquidation or realization of security may be awaited. The continuance of the loan as a bankable asset is not warranted, and the anticipated loss should have been provided for. Bangladesh Bank guidelines for timely write off of bad loans must be adhered to an aggregate score of 35 or less based on the Risk Grade Scorecard.

#### D. Credit Risk Grading Process/Procedure

- Credit risk grading should be completed by a bank for all exposures (irrespective of amount) other than those covered under Consumer and Small Enterprise Financing Prudential Guidelines and also under The Short-Term Agricultural and Micro-Credit.
- For Superior Risk Grading (SUP-1) the score sheet is not applicable. This will be guided by the criterion mentioned for superior grade account i.e. 100% cash covered, covered by Government and bank guarantee.
- Credit risk grading matrix would be useful in analyzing credit proposal, new or renewal for regular limits or specific transactions, if basic information on a borrowing client to determine the degree of each factor is a) readily available, b) current, c) dependable, and d) parameters/risk factors are assessed judiciously and objectively. The Relationship Manager as per Data Collection Checklist should collect required information.
- Relationship manager should ensure to correctly fill up Limit Utilization Form in order to arrive at a realistic earning status for the borrower.

- Risk factors are to be evaluated and weighted very carefully, on the basis of most up-to-date and reliable data and complete objectivity must be ensured to assign the correct grading. Actual parameter should be inputted in the Credit Risk Grading score Sheet.
- Credit risk grading exercise should be originated by Relationship Manager and should be an on-going and continuous process. Relationship Manager shall complete the Credit Risk Grading Score Sheet and shall arrive at a risk grading in consultation with a Senior Relationship Manager and document it as per Credit Risk grading Form, which shall then be concurred by the Credit Officer in consultation with a Senior Credit Officer.
- All credit proposals whether new, renewal or specific facility should consist of a) Data Collection Checklist, b) Limit Utilization Form, c) Credit Risk Grading Score Sheet, and d) Credit Risk Grading Form.
- The credit officers then would pass the approved Credit Risk Grading Form to Credit Administration Department and Corporate Banking/Line of Business/Recovery Unit for updating their MIS/record.
- The appropriate approving authority through the same Credit Risk Grading Form shall approve any subsequent change/revision i.e. upgrade or downgrade in credit risk grade.

#### E. Credit Risk Grading Review

Credit Risk Grading for each borrower should be assigned at the inception of lending and should be periodically updated. Frequencies of the review of the credit risk grading are mentioned below [13].

TABLE 2: CREDIT RISK GRADING REVIEW FREQUENCY

No.	Risk Grading	Short	Review Frequency (at least)
1	Superior	SUP	Annually
2	Good	GD	Annually
3	Acceptable	ACCPT	Annually
4	Marginal/Watch-list	MG/WL	Half yearly
5	Special Mention	SM	Quarterly
6	Sub-standard	SS	Quarterly
7	Doubtful	DF	Quarterly
8	Bad & Loss	BL	Quarterly

#### V. PROPOSED RISK ASSESMENT MODEL OF AN INDUSTRIAL PROJECT

A project is a complex non-routine, one time effort limited by time, budget, resources and performances specifications designed to meet customer need [14]. According to Gittenger -“The whole complex activities involved in using resources to gain benefit is a project”. Credit risk for any industrial project arises from an aggregation of financial risk, technical risk, business/industry risk, marketing risk, managerial and relationship risk and security risk. Each of the above mentioned key risk areas required to be evaluated and aggregated to arrive at an overall risk grading measure. According to the importance of risk profile, the following weights are proposed for corresponding principal risks:

TABLE 3: WEIGHTS OF THE PRINCIPAL RISK COMPONENT

Principle Risk Components	Weight
Financial Risk	30%
Technical risk	20%
Business/Industry risk	11%
Marketing risk	16%
Managerial and Relationship risk	13%
Security risk	10%

#### *Evaluation of Financial Risk*

Risk that counterparties will fail to meet obligation due to financial distress. This typically entails analysis of financials i.e. analysis of leverage, liquidity, profitability and interest coverage ratios. Key Parameters are Internal rate of return (IRR), Profitability, Return on equity, Return on investment, Net profit to sales, Expected growth rate of the project and Payback period.

#### *Evaluation of Technical Risk*

Technical analysis defines as confirming that the proposed project's design is appropriate to the borrower's needs and is in conformity with applicable technical standards. Key parameters are Sourcing and Timeliness, Relation and communication with suppliers, Power, fuel and water supply, Building and layout, Transportation facilities, Engineering and Technological facilities and Others (Manpower, Natural and Climate Factors, Safety, Information Factors).

#### *Evaluation of Business or Industry Risk*

Risk that adverse industry situation or unfavorable business condition will impact borrowers' capacity to meet obligation. To conclude, this capitalizes on the risk of failure due to low market share and poor industry growth. Key parameters are Size of business, Age of business, Business outlook, Industry growth, and Market competition.

#### *Evaluation of Marketing Risk*

Risk that can affect the borrower's capacity to meet obligations due to ineffective and disorganized marketing strategy is called marketing risk. Marketing analysis in project evaluation refers to the methodology by which strategic marketing principles are applied for the purpose of assessing the capability of an investment project to survive the competitive forces in its market. Marketing analysis also examines the integrity and consistency of the marketing assumptions and, where possible, helps in reformulating the project thereby increasing its likelihood of viability and sustained market performance. Key parameters are Size of potential market, Growth of demand, Supply, Promotional activity and Demand forecasting and market planning.

#### *Evaluation of Managerial and Relationship Risk*

Risk that counterparties may default as a result of poor managerial ability including experience of the management, its succession plan and team work is managerial risk. Relationship risk covers the conditions or relations of the

borrower with the bank. Key parameters are Experience, Team work, Skill of the manager and the management team. Account conduct and Time to achieve full capacity utilization.

#### *Evaluation of Security Risk*

Risk that the bank might be exposed due to poor quality or strength of the security in case of default is security risk. This may entail strength of security and collateral, location of collateral and support. Key parameters are Security coverage (Primary), Collateral coverage (Property location) and Support (Guarantee).

## VI. CASE STUDY OF A PROJECT RISK ASSESMENT MODEL

Mr. Adil Chowdhury, the CEO of Meghna Bank- a leading private sector commercial bank, is presiding over a meeting where the head of credit, Mr. Rahman presented the project appraisal report of the 'X' Cement Ltd. This is the country's only integrated cement manufacturing plant with a cost of USD 255 million of which 60 percent would be debt finance. ADB, IFC and some foreign banks will finance majority of the debt. The company will raise around 10 percent of their debt from the local market. Here lies the opportunity of the Meghna Bank, who wants to be the part of the project.

'X' Cement Limited was incorporated on 11 November 2001 as a private limited company in Bangladesh under the Companies Act 1994 pursuant to a Joint Venture Agreement executed on 01 November 2001 between Financier Lafarge, France and Islam Cement Limited, a company incorporated in Bangladesh. The company has been converted onto a public limited company on 20 January 2007. After completion, the Company would be primarily engaged in cement production, marketing, distribution and related business in Bangladesh. In addition, depending upon the market needs, the Company may also be involved in selling clinker.

### *A. Projected Cost and Financing Plan*

Approximately BDT 319million shall be required for initial working capital at the beginning of production, which is supposed to be started in the 4<sup>th</sup> quarter of year 2005. Working capital includes initial inventories of limestone, spares, imported bags, gypsum and consumables, representing production requirement for four to six weeks. In exchange rate in 2006 was USD 1- BDT 67. The rate of inflation in US dollar over the last five years ranged between 2% and 5%. Projected cost, financial plan, cash flow, income statement and investment outlay of the project are given below. The debt equity ratio of 'X' is 60:40. The company uses different types of debt for financing the project. On an average the cost of debt is 13%. The cost of equity is 18%.

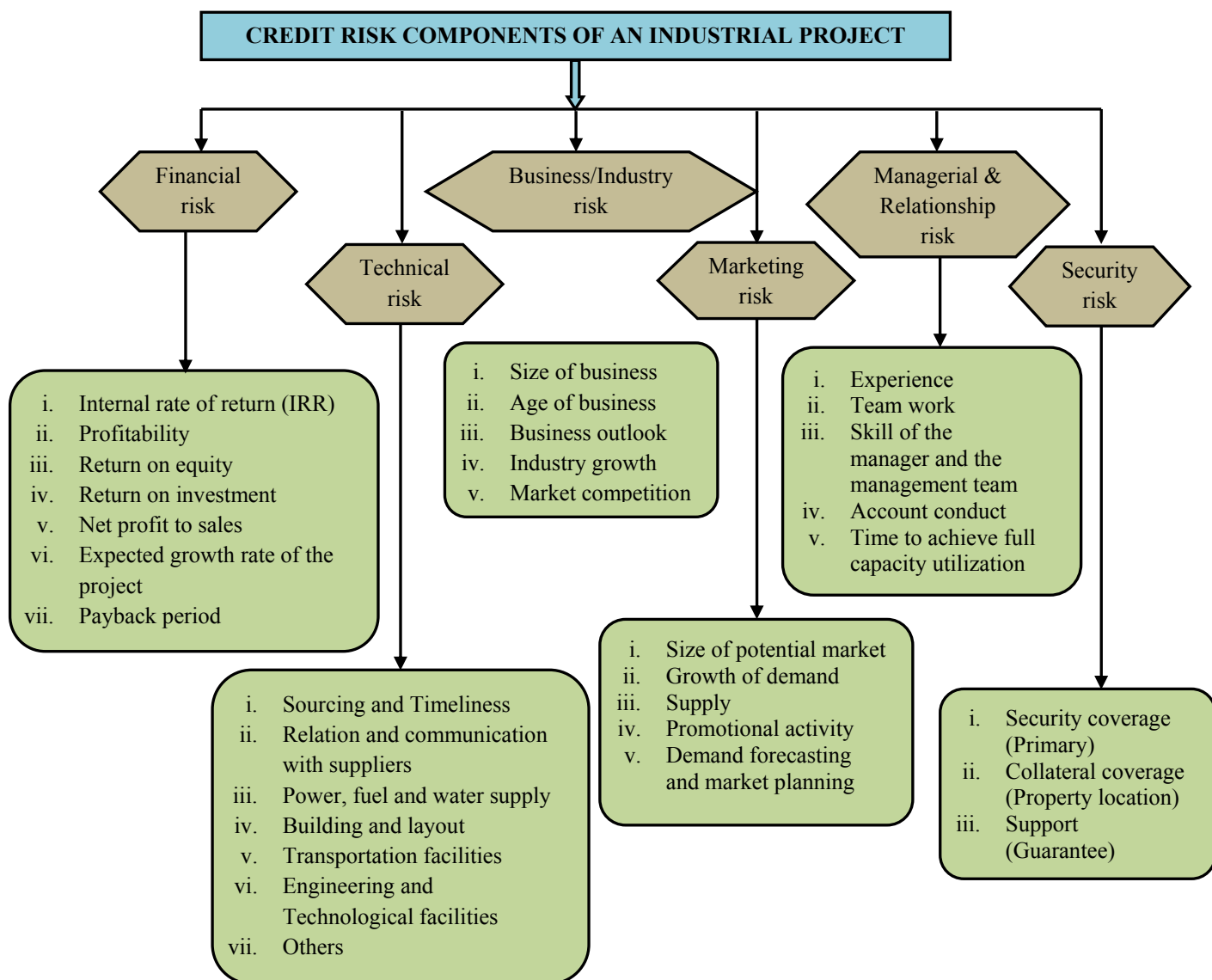


Fig. 2: Classification of Credit Risk for Financing an Industrial Project

TABLE 4: TOTAL ESTIMATED COST OF THE PROJECT AND THEIR SOURCE OF FUND

Cost Item	In million, \$	Source of Fund	Million, \$
Land and Site Development	15.9	ADB	40.0
Plant and machinery	116.63	IFC	50.0
Power Plant	16.08	DEG	12.0
Conveyer	23.91	EIB	35.0
Barges and Terminals	5.67	Local Banks	16.0
Spares	3.6	Total Debt	153
Jetty	4.00	CIRRS BV/FL	61.1
Colony	2.59	Islam Cement	2.8
Project management	1.30	Sinha Fashions Ltd.	3.0
Pre-operating expense	2.16	Private Placement/IPO	15.1
Working capital	5.00	ADB	10.0
Interest during construction	22.20	IFC	10.0
Contingencies	4.46	Total Equity	102
Total project cost	255	Total Fund	255

TABLE 5: INVESTMENT OUTLAY

Year	Investment (in million Tk)	Exchange rate	Investment (in million \$)
2003	4885.22	59.5	82.10
2004	6980.85	62.0	112.59
2005	3578.26	64.5	55.48
Total	15444.33		250.18

TABLE 6: CASH FLOW OF THE PROJECT

Year	Cash Flow
2003	2698340
2004	6295440
2005	2103340
2006	2377620
2007	2530620

2008	2760120
2009	2760120

TABLE 7: TOTAL INVESTMENT

Year	Investment ( in million Taka)
2004	11866.07
2005	15444.33

TABLE 8: DEMAND RATE OF DIFFERENT YEARS

Year	Demand ( in million ton)
2001	21
2002	25
2003	26.82

TABLE 9: INCOME STATEMENT

Projected Income Statement For year 2005 (in thousands of Taka)
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Sales revenue	1305600
Less COGS	822528
Gross profit	484072
Less SG & A	91392
Earning before tax	391680
Less tax	116880
Earning after tax	244800

## VII. RISK CALCULATION AND RESULTS

On the basis of the above information, financial, technical, business/industry, marketing, managerial and security risk of the project is calculated.

TABLE 10: FINANCIAL RISK CALCULATION (WEIGHT 30%)

Criteria	Parameter	Score	Actual parameter	Score obtained
1. Internal rate of return	Greater than 30%	4	8.7%	1
	21% to 29%	3		
	11% to 20%	2		
	5% to 10%	1		
	Less than 5%	0		
2. Profitability	Greater than 25%	6	37%	6
	20% to 24%	5		
	15% to 19%	4		
	10% to 14%	3		
	6% to 9%	2		
	1% to 5%	1		
	Less than 1%	0		
3. Return on equity	Greater than 30%	3	76.8%	3
	11% to 30%	2		
	1% to 10%	1		
	Less than 1%	0		
4. Return on investment	Greater than 30%	3	10.95%	2
	11% to 30%	2		
	1% to 10%	1		
	Less than 1%	0		
5. Net profit to sales	Greater than 30%	6	18.75%	3
	26% to 30%	5		
	21% to 25%	4		
	16% to 20%	3		
	11% to 15%	2		
	0% to 10%	1		
	Less than 0%	0		
6. Expected growth rate of project	Excellent ( 15%+)	4	30.15%	4
	Strong ( >10% to 15%)	3		
	Good ( >5% to 10%)	2		
	Moderate ( >1% to 5%)	1		
	No growth ( <1% )	0		
7. Payback period	Less than 1 year	4	6 years	1
	1 to 3 year	3		
	3 to 5 year	2		
	5 to 10 year	1		
	More than 10 year	0		
<b>Total score – Financial risk</b>		<b>30</b>		<b>20</b>

TABLE 11: TECHNICAL RISK CALCULATION (WEIGHT 20%)

Criteria	Parameter	Score	Actual parameter	Score obtained
1. Sourcing and timeliness	Excellent	3	Satisfactory	2
	Satisfactory	2		
	Below average	1		
2. Relation and communication with suppliers	Strong	3	Good	2
	Good	2		
	Moderate	1		
3. Power, fuel and water supply	Excellent	3	Excellent	3
	Sufficient	2		
	Moderate	1		
	Poor	0		
4. Building and layout	Excellent	2	Favorable	1



	Favorable Not satisfactory	1 0		
5. Transportation facilities	Excellent Good Sufficient Moderate Not acceptable	4 3 2 1 0	Excellent	4
6. Engineering and technological facilities ( Technologically upgraded equipment, research and testing facilities )	Excellent Favorable Moderate Not satisfactory	3 2 1 0	Favorable	2
7. Others ( manpower, natural and climate factors, safety and information factors)	Favorable Average Not favorable /negligible	2 1 0	Favorable	2
<b>Total Score – Technical risk</b>		<b>20</b>		<b>16</b>

TABLE 12: BUSINESS/ INDUSTRY RISK CALCULATION (WEIGHT 11%)

Criteria	Parameter	Score	Actual parameter	Score obtained
1. Size of business ( sales in BDT crore )	>50.00 25 – 49.99 5 – 24.99 < 5.00	3 2 1 0	130.56 crore	3
2. Age of business	10 or more than 10 year 2 - 9 years Less than 2 year	2 1 0	8 years	1
3. Business outlook	Favorable Stable Cause for concern	2 1 0	Favorable	2
4. Industry	Strong	2	7%	1

growth	(>10%) Favorable ( 1% to 10%) No growth ( <1%)	1 0		
5. Market competition	Dominant player Highly competitive Moderately competitive	2 1 0	Highly competitive	1
<b>Total score – Business/Industry risk</b>		<b>11</b>		<b>8</b>

TABLE 13: MARKETING RISK CALCULATION (WEIGHT 16%)

Criteria	Parameter	Score	Actual parameter	Score obtained
1. Size of potential market	Large Sufficient Medium Low	3 2 1 0	Sufficient	2
2. Growth of demand	Greater than 15% 11% to 15% 6% to 10% 1% to 5% Less than 1%	4 3 2 1 0	11.65%	3
3. Supply	Excellent Good Moderate Inadequate	3 2 1 0	Good	2
4. Promotional activity	Strong Moderately effective Ineffective	2 1 0	Strong	2
5. Demand forecasting and market planning	Accurate forecasting with perfect planning Fair forecasting with good planning Moderate forecasting with acceptable planning Inaccurate forecasting with poor planning	3 2 1 0	Fair forecasting with good planning	2
<b>Total Score – Marketing risk</b>		<b>16</b>		<b>11</b>

TABLE 14: MANAGERIAL AND RELATIONSHIP RISK CALCULATION (WEIGHT 13%)

Criteria	Parameter	Score	Actual parameter	Score obtained
1. Experience	Greater than 10 years 5-10 years 1-5 years 0 year	3 2 1 0	8 years	2
2. Team work	Very good Fair Poor or regular conflict	2 1 0	Very good	2
3. Skill of the manager or the management team	Highly skilled Sufficient efficiency Average efficiency	3 2 1	Sufficient efficiency	2

	Inadequately skilled	0		
	More than 3 (three) years accounts with faultless record	3		
	Less than 3 (three) years accounts with faultless record	2		
4. Account conduct	Accounts having satisfactory dealings with some late payments	1	3 years accounts with faultless record	2
	Frequent Past dues & Irregular dealings in account	0		
5. Time to reach full capacity	Less than or equal to 5 years	2		
	5 – 10 years	1	5 years	2
	More than 10 years	0		
<b>Total Score- Managerial and relationship risk</b>		<b>13</b>		<b>10</b>

TABLE 15: SECURITY RISK CALCULATION (WEIGHT 10%)

Criteria	Parameter	Score	Actual Parameter	Score obtained
1. Security coverage (primary)	Fully pledged facilities/substantially cash covered/ Reg. Mortg. for HBL	4	Inferior charge	2
	Registered Hypothecation (1 <sup>st</sup> charge/ 1 <sup>st</sup> Pari passu charge)	3		
	2 <sup>nd</sup> Charge/ Inferior charge	2		
	Simple hypothecation/ negative lien on assets	1		
	No security	0		
2. Collateral coverage (Property Location)	Registered Mortgage on Municipal corporation/ Prime area property.	4	No property but plant & machinery as collateral	2
	Registered Mortgage on Pourashava/ semi-urban area property	3		
	Equitable Mortgage or No property but plant & machinery as collateral	2		
	Negative lien on collateral	1		
	No collateral	0		
3. Support (Guarantee)	Personal guarantee with net worth or Strong corporate guarantee	2	Personal guarantees with average financial strength	1
	Personal guarantees or corporate guarantee with average financial strength	1		
	No support/ guarantee	0		
<b>Total score- security risk</b>		<b>10</b>		<b>5</b>
<b>Grand total – All risk</b>		<b>100</b>		<b>70</b>

TABLE 16: GRADING CATEGORIES AND SCORES

Score	Grading	In Short
100	Superior	SUP
85+	Good	GD
75-84	Acceptable	ACCPT
65-74	Marginal / watch list	MG/WL
55-64	Special mention	SM
45-54	Substandard	SS
35-44	Doubtful	DF
<35	Bad / Loss	BL

From the table 16, it is seen that the total score (70) of this project lies in the Marginal/Watch list category.

## VIII. CONCLUTIONS

An appropriate, precise and flexible Credit Risk Assessment and Evaluation model or system is mandatory for creating and adopting a risk management culture in the organization for developing a sustainable credit risk management environment in the banking sector of Bangladesh. Credit risk generates not only from counter party but also from improper policies, procedures and systems within the organization. This paper focuses on the weakness of the existing risk evaluation system that entails assessing risk through counter party or single obligor wise risk analysis. The new proposed Credit Risk Assessment and Evaluation system describes a new lending system that

specifically addresses the flaws, thus helping all parties to the process. Based on the proposed evaluation system, it is expected that the credit risk analysis policies should: always follow the detailed and formalized credit evaluation or appraisal process, provide risk identification, measurement, monitoring and control, define target markets, risk acceptance criteria, credit approval authority, credit maintenance procedures and guidelines for portfolio management, be communicated to branches or controlling offices and clearly spell out roles and responsibilities of units involved in origination and evaluation system of credit risk for any industrial project.

## IX. FUTURE WORKS

Because of time constraint, only the vital parameters for all the risk categories have been suggested and implemented in the model but there is a huge scope of expanding the range with more important parameters for more accurate risk calculation. It is also recommended to incorporate advanced level statistical tools and analytical model in the future CRG system of managing the credit risk in order to make it responsive to the global trend and simultaneous changes. There is scope to incorporate sensitivity analysis by developing simulation model in the upgraded and advanced version of CRG model in the near future to be

consistent with changing market scenario and making it a more intelligent system. The risk assessment model described here is mainly applicable for industrial project. It can be recommended that with the help and reference to this model, future risk assessment model can be prepared which will be applicable for any kind of projects of any size or durations easily and accurately.



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