Sudan University of Science & Technology

College of Graduate Studies

Influence of Applying Credit Scoring Technique on Customers' Creditworthiness Estimation:

An Empirical Model to Predict the Probability of Default on Islamic Finance Modes in Sudan

During 2010-2014

أثر تطبيق تقنية التصنيف الائتماني في تقييم الجدارة الائتمانية للعملاء:

نموذج تجريبي للتنبؤ بالتعثر في صيغ التمويل الإسلامية في السودان

خلال الفترة 2010-2014

A Thesis submitted by:

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In fulfilment of the **requirement of PH.D degree in**

Banking studies

Supervisor: Dr. Ibrahim Fadulemawla Elbasheer

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بسم الله الرحمن الرحيم

جامعة السودان للعلوم والتكنولوجيا

كلية الدراسات العليا

كلية الدراسات العليا

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<u>DECLARATION</u>

I, the signing here-under, declare that I am the sole author of the (Ph.D.) Thesis entitled: ***Influence of Applying Credit-Scoring Technique on Customers' Creditworthiness Estimation: An Empirical Model to predict the probability of default on Islamic Finance Modes in Sudan during 2010-2014,*** which is an original intellectual work. Willingly, I assign the copyright of this work to the College of Graduate Studies (CGS), Sudan University of Science and Technology (SUST). Accordingly, SUST has all the rights to publish this work for Scientific purposes.

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<u>إقــرار</u>

أنا الموقع أدناه أقر بأنني المؤلف الوحيد لرسالة الدكتوراة المعنونة: *أثر تطبيق تقنية التصنيف الائتماني في تقييم الجدارة الائتمانية للعملاء "نموذج تجريبي للتنبؤ بالتعثر في صيغ التمويل الإسلامية في السودان خلال الفترة 2010 – 2014".*

و هي منتج فكري أصيل. و باختياري أعطي حقوق طبع و نشر هذا العمل لكلية الدراسات العليا جامعة السودان للعلوم و التكنولوجيا، عليه يحق للجامعة نشر هذا العمل للأغراض العلمية.

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بسم الله الرحمن الرحيم

الاستهـــــــــــــــــــــلال

قال الله تعالى:﴿يَاأَيُّهَا الَّذِينَ آمَنُوا إِذَا تَدَايَنْتُمْ بِدَيْنٍ إِلَى أَجَلٍ مُسَمًّى فَاكْتُبُوهُ وَلْيَكْتُبْ بَيْنَكُمْ كَاتِبٌ بِالْعَدْلِ وَلَا يَأْبَ كَاتِبٌ أَنْ يَكْتُبَ كَمَا عَلَّمَهُ اللَّهُ فَلْيَكْتُبْ وَلْيُمْلِلِ الَّذِي عَلَيْهِ الْحَقُّ وَلْيَتَّقِ اللَّهَ رَبَّهُ وَلَا يَبْخَسْ مِنْهُ شَيْئًا فَإِنْ كَانَ الَّذِي عَلَيْهِ الْحَقُّ سَفِيهًا أَوْ ضَعِيفًا أَوْ لَا يَسْتَطِيعُ أَنْ يُمِلَّ هُوَ فَلْيُمْلِلْ وَلِيُّهُ بِالْعَدْلِ وَاسْتَشْهِدُوا شَهِيدَيْنِ مِنْ رِجَالِكُمْ فَإِنْ لَمْ يَكُونَا رَجُلَيْنِ فَرَجُلٌ وَامْرَأَتَانِ مِمَّنْ تَرْضَوْنَ مِنَ الشُّهَدَاءِ أَنْ تَضِلَّ إِحْدَاهُمَا فَتُذَكِّرَ إِحْدَاهُمَا الْأُخْرَى وَلَا يَأْبَ الشُّهَدَاءُ إِذَا مَا دُعُوا وَلَا تَسْأَمُوا أَنْ تَكْتُبُوهُ صَغِيرًا أَوْ كَبِيرًا إِلَى أَجَلِهِ ذَلِكُمْ أَقْسَطُ عِنْدَ اللَّهِ وَأَقْوَمُ لِلشَّهَادَةِ وَأَدْنَى أَلَّا تَرْتَابُوا إِلَّا أَنْ تَكُونَ تِجَارَةً حَاضِرَةً تُدِيرُونَهَا بَيْنَكُمْ فَلَيْسَ عَلَيْكُمْ جُنَاحٌ أَلَّا تَكْتُبُوهَا وَأَشْهِدُوا إِذَا تَبَايَعْتُمْ وَلَا يُضَارَّ كَاتِبٌ وَلَا شَهِيدٌ وَإِنْ تَفْعَلُوا فَإِنَّهُ فُسُوقٌ بِكُمْ وَاتَّقُوا اللَّهَ وَيُعَلِّمُكُمُ اللَّهُ وَاللَّهُ بِكُلِّ شَيْءٍ عَلِيمٌ﴾.

سورة البقرة

الآيه 282

Dedication

I would like to dedicate this Doctoral dissertation to my father, my mother, my beloved family and friends for their support, help, and standing by me. No doubt that without their continued support and counsel I could not have completed this process.

Acknowledgements

Abstract

The study aimed to investigate the existence of the potential link between credit scoring and financial decision making by investigating the influence of credit scoring updates on customer affordability, explore the relationship between credit risk and credit scoring, and determine the effect of applying a credit scoring system on decreasing the probability of default through the accuracy of creditworthiness assessment progress in Sudanese commercial banks. Following an investigative phase to identify relevant variables in the sector, the research proceeds to an evaluative phase, in which an analysis is undertaken of financial and demographic data sets for Islamic finance applicants during 2010-2014. The study problem stemmed from the commercial banks adoption of personal judgment approach, which leads to grant credits to inappropriate borrowers while Statistical scoring techniques are shown to provide more efficient classification results than the currently used judgmental techniques. The study depended on several research methods; hence, the study adopted the descriptive methodology to determine the magnitude and the causes of the problem, the Discriminant analysis in the applied aspect, and the inductive method in drawing conclusions. The study indicated the existence of a statistical significant adverse relationship between high credit score and the probability of default; also, the existence of a statistically significant positive relationship between adopting credit scoring model and creditworthiness estimation process. The study most important recommendations call for commercial banks in Sudan to adopt the proposed model which may have positive influence in decreasing the non-performing loans.

المستخلص

هدفت الدراسة إلي التحقق من وجود علاقة محتملة بين التصنيف الائتماني و إتخاذ القرارات المالية عن طريق التحقق من أثر التصنيف الائتماني علي معرفة قدرة العملاء علي سداد إلتزاماتهم ، إستكشاف العلاقة بين مخاطر التمويل و التصنيف الائتماني، و تحديد أثر تطبيق نظام التصنيف الائتماني في خفض إحتمالية التعثر عبر تقييم عملاء المصارف التجارية في السودان ائتمانياً بصورة دقيقة. و ذلك عن طريق تحديد المتغيرات ذات الصلة بالقطاع المصرفي. و يأتي هذا البحث لتقييم و تحليل مجموعة من البيانات المالية و الديموغرافية للعملاءالذين تقدموا للحصول علي تمويل إسلامي خلال الفترة (2010–2014). تمثلت مشكلة الدراسة في إعتماد المصارف علي طريقة التقييم الشخصي للعملاء عند منح التمويل الأمر الذي يؤدي إلي منح التمويل للأشخاص غيرالمناسبين، في حين أنه ظهرت تقنيات إحصائية أكثر دقة و كفاءة من التقييم الشخصي لتصنيف العملاء ائتمانياً. إعتمدت الدراسة علي عدد من المناهج كالمنهج الوصفي للتعرف علي حجم المشكلة و تحديد أسبابها، منهج تحليل التمايز للمفاضلة بين العملاء، و المنهج الإستقرائي لإستخلاص النتائج و الخروج بالتوصيات. من أهم نتائج الدراسة: وجود علاقة عكسية ذات دلالة إحصائية بين التصنيف الائتماني المرتفع و إحتمالية عدم القدرة علي السداد، وجود علاقة طردية ذات دلالة إحصائية بين تطبيق نموذج التصنيف الائتماني و تقييم الجدارة الائتمانية للعملاء. من أهم التوصيات: علي الجهاز المصرفي السوداني تبني النموذج الإحصائي المقترح كجزء لا يتجزأ من عملية تقييم جدارة العملاء الأمر الذي سيكون له الأثر في خفض معدلات الديون المتعثرة.

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List of Abbreviations

4Rs	The four basic elements that drive lender's profits, and can be Measured: risk, response, Revenue, and retention.
5Cs	The five elements underling traditional risk assessment: capacity, capital, conditions, character, and collateral.
ACB	Associated credit bureaus.
AUROC	Area under the Receiver Operating Characteristic.
BCBS	Basel Committee for Banking Supervision.
BRDD	Banking regulations and development department.
CAIS	Credit account information sharing.
CAMELS	The component of a bank's condition that are assigned: Capital, assets, management capability, earnings, liquidity, and sensitivity.
CBs	Credit bureaus. Commercial banks.
CBOS	Central Bank of Sudan.
CBOSCR	Central Bank of Sudan credit registry.
CBOSID	Central Bank of Sudan identity.
CCJs	Country court judgments.
CEO	Chief executive officer.
CFA	Customer federation of America.
CIASA	Credit information and scoring agency.
CRA	Customer federation of America.
CRMC	Credit Risk Management Cycle.
D&B	Dun and Bradstreet.
EAD	Exposure at default.
EL	Expected loss
EU	European union.
FCRA	Federal credit reporting Act
G10	Group of 10 industrialized countries that are members of the International Monetary Fund (IMF), including Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Sweden, United Kingdom, and the United States (Switzerland joined as the 11th member in 1984,

	but is not part of the IMF), United Kingdom, and the United States (Switzerland joined as the 11th member in 1984, but is not part of the IMF).
GDP	Gross domestic product.
GSEs	Government sponsored enterprise**.**
IRB	Internal ratings based.
IRRS	Internal risk scoring system.
IT	**I**nformation technology.
ITC	Information trust corporation.
LGD	Loss given default.
MDA	Multiple Discriminant analysis.
METAC	Middle East Regional Technical Assistance Centre.
MOP	Manner of payment.
NCRA	National credit reporting association.
NPL	Non-performing loan.
NSF	Not sufficient funds.
OCC	Office of the Comptroller of the Currency.
ODPR	Office of the data protection registrar.
OTC	Over the counter clearing.
PCBs	Public credit bureaus.
PCRs	Public credit registries.
PD	Probability of default.
RCA	Retailers commercial agency.
RCC	Retail credit company.
RR	Robust risk scoring system
SDG	Sudanese gunaih
SME	Small and medium enterprise.
SPSS	Statistical package for the social sciences.
UAPT	United association for protection of trade.
UPC	Union *Professionnelle du* credit.
US	United states.
USD	United States Dollar
UTCC	Union tank car company.

VPN	Virtual private network.
Y/N	Yes/No.

List of Appendices

Appendix A	CIASA individual disputing form.
Appendix B	Credit information and scoring agency ACT.
Appendix C	Basic individual credit report.
Appendix D	Basic credit report for company.
Appendix E	Basic credit report for organization.
Appendix F	Standard credit report for individual.
Appendix G	Standard credit report for company.
Appendix H	Standard credit report for organization.
Appendix I	Advanced credit report for individual.
Appendix J	Advanced credit report for company.
Appendix K	Advanced credit report for organization.
Appendix L	CBOS circular no (1/2005).

CHAPTER I

INTRODUCTION

1.1 PREAMBLE:

A credit scoring assesses the creditworthiness of an individual, corporation, or even a country. It tells a lender or investor the probability of the subject being able to pay back a loan. Credit scorings calculated from financial history and current assets and liabilities. The lay investors can easily comprehend the scores expressed in code numbers, which is a poor credit scoring indicates a high risk of defaulting on a loan.

Scorings have become an increasingly influential force and driven by many factors. They have become a source of information for banks, as they look to scorings as one element in the overall decision to invest in security or to lend to a particular borrower. Scorings have become a vital part of the global capital markets, having been a long established form of investor information.

In the context of the development that the world is witnessing in all fields and growing, this occurred on the economies of most countries and especially the financial and banking sector, in order to maintain this growth is increasing the need arose to make farther efforts to reduce the risk of banks in the midst of increasing competition, has emerged evident in the requirements of the decisions of basil committee I & Π focused on the whole banking risk management in it is various forms and the credit risk specifically, and reached by specialists that the credit risk represent more than 60% on average in most countries, so we had to find effective solutions to reduce these risks and that the search for effective alternative to contribute positively to increase the return on bank financing and reduce losses to a minimum.

As the process of funding the good based primarily on information and comprehensive data about the customer and the process to be funded, specialists in banking began thinking in the establishment of centres or specialized institutions to collect, analyze and save data for all clients of banks and other financial institutions, and provide this data at demand so as to make them when guided by the client to obtain financing.

1.2 MOTIVATION OF THE STUDY:

The motivation for carrying out this study arose from the following considerations:

❖ The aim of this thesis is to study the existence and characteristics of the potential link between credit scoring and financial decision making by investigating the influence of credit scoring updates on customer creditworthiness.

❖ The purpose of this thesis is to explore the relationship between credit scoring and probability of default on Islamic finance.

❖ As the researcher is working in Central Bank of Sudan, his interest brought him to participate and share in developing the present practices and performance of credit scoring systems.

1.3 IMPORTANCE OF THE STUDY:

Importance of this study stems from the following points:

1.3.1 SCIENTIFIC IMPORTANCE:

❖ The lack of currently available literature on credit scoring in the Islamic banking and finance sector has resulted in the application and review of general literature on credit scoring in conventional banks and other financial institutions.

1.3.2 PRACTICAL IMPORTANCE:

❖ The importance of credit scoring has become more critical within the banking sector due to the fast growth of the credit industry, the need to manage loan portfolios, the need to reduce the cost of the credit evaluation, and the need to enhance the efficiency and effectiveness of the credit decision-making process.

❖ Scoring serves as a useful tool for different constituents of the Islamic capital market. For different classes of persons, different benefits accrue from the use of rated instruments.

❖ Credit scoring systems used as a tool for banks in the assessment of trustworthy information. So the findings of this study could adopt by CBs.

1.4 PROBLEM OF THE STUDY:

Customer creditworthiness and default prediction was not been studied relatively to Islamic finance at all in Sudan. The need of customer creditworthiness assessment today is at its highest, but at the same time, the default rate has risen from the banks'

perspective, the riskiness of these loans is usually higher than that of regular bank operations. In this regards, applicants scrutinized before the credit facility granted them.

Traditional methods of deciding whether to grant loan to an individual based on human judgment using classical 5Cs approach by checking out customers' "character, capital, conditions, capacity, and collateral", and experience of previous decisions. These methods are not objective but very subjective. However, to consider every small loan as a separate loan is time consuming and expensive. Usually the lender does not have information about the solvency or credit behaviour of a new potential customer and especially in customer credit business. Thus, to determinate the customers' expected probability of default the lender must estimate his ability to pay back from his current characteristics, as default could only observe afterwards. Using a statistical approach in estimating the probability of default gives an objective and straightforward approach.

Subsequently, Banks have to be careful in their credit assessment to customers in order to make the right decision and to evaluate customers precisely. This includes two possible outcomes; to prove credits to inappropriate borrowers (type I error), or to judge potentially good borrowers as inappropriate, and reject credits (type II error).To avoid these problems and see if a potential customer is credit worthy, the banks have to collect necessary information in order to make a good decision. However, there are few guidelines on this study and its application in creditworthiness evaluating and probability of default estimating techniques in Islamic banking credit decisions making.

1.5 QUESTIONS OF THE STUDY:

Up to the time of this study, there are no formal customer credit decision-making models used to evaluate applicants for credit in Sudanese banking sector. With this background, the researcher aimed to answer the main study questions, which are:

1. What is the best approach/process to evaluate the creditworthiness of an individual?

2. What are the attributes/characteristics that banks should consider while assessing an individual for customer Islamic finance?

3. What are the issues to be consider while developing and implementing the credit-scoring model within Islamic modes of finance?

4. To what extent is the development of an objective credit scoring model achievable within the Sudanese banking sector?

1.6 OBJECTIVES OF THE STUDY:

1.5.1 GENERAL OBJECTIVE:

❖ Adopt and explore the nature of banks credit scoring techniques and its ability to be applicable within Islamic finance.

1.5.2 SPECIAL OBJECTIVES:

❖ Address the gaps between this study and previous studies by carrying out an empirical study to develop a credit-scoring model, which would address objectivity as well as risk management for applicants within the Sudanese banking sector.

❖ Predict the probability of default for potential credit customers.

❖ Determine the influence of credit scoring on the assessment of the banks creditors' creditworthiness and affordability.

❖ Identify the determinants of scoring techniques.

1.7 HYPOTHESIS IF THE STUDY:

This study will test the following hypothesis: to assure their validity and / or conformity to be accepted, or reject:

❖ There is a link between Credit scoring and the evaluation of customer's creditworthiness.

❖ There is a negative correlation between high credit score of a customer and the probability of default within Islamic modes of finance.

❖ Developing and implementing a credit-scoring model may have a significant influence on creditworthiness assessment process of Islamic banks in Sudan.

1.8 SOURCE OF DATA:

Main sources of data for this study include internal banking books and records of the Central Bank of Sudan (CBOS). Main textbooks considered the issue as well as the magazines, periodicals, annual reports, and previous studies.

The study relied mainly on secondary data collected from the Central Bank of Sudan, containing the main indicators of Credit registry and credit scoring projects.

1.9 MODEL OF THE STUDY:

DEPENDENT VARIABLE:

In this study, the 'Credit Score' is the dependent variable. Credit score is a number that denotes the creditworthiness of applicants. The higher the credit score, the higher the creditworthiness of an applicant, while the lower the credit score, the lower the creditworthiness of an applicant.

INDEPENDENT VARIABLES:

There were total fifteen independent variables for the credit-scoring model for individuals. Most of these factors are socio- demographic variables.

Independent Variables of SICSMI:

1	Customer full name	8	Date of birth
2	Customer mother	9	Contact number
3	Customer wife/husband name	10	Gender
4	Nationality	11	Marital status
5	National Number	12	Currency of contract

6	Personal identity	13	Negative status of customer
7	Address	14	Reasons for default

1.10 METHODOLOGY OF THE STUDY:

A Discriminant analysis approach will be used to model the loan default. Data on granted loans (both those who have defaulted and those in outstanding status) will be taking from Sudanese banking sector databases. SPSS software version 16 will be use to analyse the data.

1.11 LIMITATION OF THE STUDY:

The period covered by this study was extended from 2010-2014. The study will take (Sudanese banking sector) as a case of study.

1.12 CONTRIBUTIONS OF THE STUDY:

The study is significant in the following ways:

The main contribution of this study is to make a significant original contribution to banking practice in Sudan. Which is embedded on the study topic *"The Influence of Applying Credit-Scoring Technique on Customers' Creditworthiness Estimation: An Empirical Model to Predict the Probability of Default on Islamic Finance Modes in Sudanduring 2010-2014"*, meaning that this study has carried out an empirical work that has not been done within the Sudanese banking sector. This is helping banks and financial institutions to have technique that can effectively predict their probability of default. The choice of the study area related to the growth of the customer credit market (from the year 2010), the sparse literature on customer credit risk management and non-adoption of an objective risk scoring technique on the lines of credit scoring within the Islamic financing.

Further, the issues on model development, model implementation, and evaluation identified within the literature and found empirically in this study have identified the challenges banks in the coming days could counter in the formal credit scoring model development process. This study offers banks with a valuable insight on the operational, technical, cultural, and business issues relating to credit scoring that will faced in developing or adopting a credit-scoring model in the future.

The process of model development together with that was final model obtained as outcome of this study, has provided a valuable dimension not only to the Sudanese banking sector but also to model developers as it provides details on appropriate modelling technique, the sampling process, data considerations and performance monitoring. In response to the regulator of the Sudanese banking sector who has emphasized the need for risk-based supervision, banks in Sudan have to begin adopting more sophisticated risk based credit decision frameworks. It is argue that the credit-scoring model developed here could be use as a prototype model for customer credit in Sudanese banking sector.

By developing an accurate credit-scoring model, banks will be able to identify Islamic loans that have lower probability of default versus loans that have a higher probability of default. Thus, they will better rate the loans, price the loans, and may benefit from capital savings. It will help future researchers who want to study into customer credit.

1.13 STRUCTURE OF THE STUDY:

This study lies in five chapters however; the sequence of these chapters reflects the consistency used in approaching, analysing, and solving the study problem. The characteristics and main contents of chapter one presented the thesis Introduction, chapter two relates to the credit reporting systems, chapter three addresses the Credit Scores and credit bureaux, chapter four of the thesis relates to the (applying credit scoring System in Sudanese Banking sector), and the final chapter includes; study conclusion, findings, and recommendations.

1.14 PREVIOUS STUDIES RELATED TO THE TOPIC:
FIRST: ABDO,H., ALAM, S. &MULKEEN, J. (2014)[1]:

The main aim of this paper was to distinguish whether the decision making process of the Islamic financial houses in the UK can be improved through the use of credit scoring modelling techniques as opposed to the currently used judgmental approaches. Subsidiary aims were to identify how scoring models can reclassify accepted applicants who later are considered as having bad credit and how many of the

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[1]Abdo, H., Alam, S. &Mulkeen, J. 2014, would credit scoring work for Islamic finance?A neural network approach', International Journal of Islamic and Middle EasternFinance and Management, 7(1), pp. 112-125.

rejected applicants are later considered as having good credit; and highlight significant variables that are crucial in terms of accepting and rejecting applicants which can further aid the decision making process. A real data-set of 487 applicants are used consisting of 336 accepted credit applications and 151 rejected credit applications make to an Islamic finance house in the UK. In order to build the proposed scoring models, the data set is divided into training and holdout sub-set. The training sub-set used to build the scoring models, the holdout sub-set used to test the predictive capabilities of the scoring models.70 percent of the overall applicants used for the training sub-set,and 30percent used for the testing sub-set. Three statistical modelling techniques namely Discriminant Analysis (DA), Logistic Regression (LR) and Multi-layer Perception (MP) neural network are used to build the proposed scoring models.

Their findings revealed that the LR model has the highest Correct Classification (CC) rate in the training sub-set whereas MP outperforms other techniques and has the highest CC rate in the holdout sub-set. MP also outperforms other techniques in terms of predicting the rejected credit applications and has the lowest Misclassification Cost (MC) above other techniques. In addition, results from MP models show that monthly expenses, age and marital status are identified as the key factors affecting the decision making process.

Although their sample was small and restricted to an Islamic Finance house in the UK, the results are robust. Future study could consider enlarging the sample in the UK and also internationally allowing for cultural differences to be identified. The results indicated that the scoring models could be of great benefit to Islamic finance houses in regards to their decision-making processes of accepting and rejecting new credit applications and thus improve their efficiency and effectiveness.

SECOND: JUN HUANG (2014)[1]:

In this study, a hybrid model is developed for credit scoring problems to predict the classification accuracy based on selected subsets by first Establishing a correlation coefficient based binary quadratic programming model for feature

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[1]**JUN HUANG**, 2014, Feature selection in credit scoring - aquadric programming approach solving with bisection method based on TABU search, Thesis Presented for the degree ofDoctor of Philosophy,Texas A&M International University.

selection. The model is then solved with the bisection method based on TABU search algorithm (BMTS) and provides optional subsets of features in different sizes from which the satisfactory subsets for credit scoring models are v selected based on both the size and overall classification accuracy rate (OCAR). The results of this proposed BMTS+SVM method, tested on two benchmark credit datasets, shed light on the improvement of the existing credit scoring systems with flexibility and robustness.

This validated method is then used in an international business context to test the data on the U.S. and Chinese companies in order to find out the subsets of features that act as key factors in distinguishing good credit companies from bad credit companies in these two countries.

THIRD: ANNE KRAUS (2014)[1]:

The aim of this thesis was to benchmark different methods for building scoring models in order to maximize the AUC. While this measure used to evaluate the predictive accuracy of the presented algorithms, the AUC especially introduced as direct optimization criterion. The logistic regression model is the most widely used method for creating credit scorecards and classifying applicants into risk classes. Since this development, process, based on the logit model, is standard in the retail banking practice, the predictive accuracy of this proceeding used for benchmark reasons throughout this thesis.

The AUC approach was a main task introduced within this work. Instead of using the maximum likelihood estimation, the AUC considered as objective function to optimize it directly. The coefficients estimated by calculating the AUC measure with Wilcoxon-Mann Whitney and by using the NelderMead algorithm for the optimization. The AUCoptimization denotes a distribution-free approach, which is analysed within a simulationstudy for investigating the theoretical considerations. It could show that the approachstill works even if the underlying distribution is not logistic. In addition to the AUC approach and classical well-known methods like generalized additive models, new methods from statistics and machine learning evaluated for the credit scoring case.

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[1]**Anne Kraus**, 2014, Recent Methods from Statistics andMachine Learning for Credit Scoring, Thesis Presented for the degree ofDoctor of Philosophy, University of Minchin.

Conditional inference trees, model-based recursive partitioning methods, and random forests presented as recursive partitioning algorithms. Boosting algorithms also explored by additionally using the AUC as a loss function.The empirical evaluation based on data from a German bank. From the application scoring, 26 attributes are included in the analysis. Besides the AUC, different performance measures used for evaluating the predictive performance of scoring models. While classification trees cannot improve predictive accuracy for the current credit scoring case, the AUC approach and special boosting methods provide outperforming results compared to the robust classical scoring models regarding the predictive performance with the AUC measure.

FOURTH: HERICK ONDIGO (2013)[1]:

The objective of this study was to establish the effect of credit risk management and Financial Performance of commercial banks in Rwanda. The study had four specific objectives of establishing how credit risk identification, credit risk analysis and assessment, credit scoring mechanism and risk monitoring affect financial performance of commercial banks in Rwanda. The study adopted a descriptive study design, which assisted to examine the effect between regulation and financial performance of commercial banks. The sample size as well as the population of the study was eleven commercial banks. The response rate was a 100%, which comprised 11commercial banks. Data was gathered using a data a questionnaire and analysed using SPSS 17.

The overall finding and conclusion of the study was that all the measures of credit risk management used in this study are highly significant predictors of financial performance of commercial banks in Rwanda except risk monitoring. The credit risk identification found to be significant in explaining profitability of commercial banks in Rwanda. The credit risk scoring and credit analysis and assessment also found to be significant to explain the financial performance . Based on the findings another study can be conducted in Rwanda but should really explain expand the variables of credit risk management that affect financial performance of commercial banks.

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[1]**HerickOndigo**, 2013, The effect of credit risk management on the financial performance of commercial banks in RWANDA, A Study Project submitted in partial fulfilment of the requirements of the degree of Master of Business Administration, School of Business, University of Nairobi

Well management of credit risks a key pillar of financial institution operations in Rwanda and by extension pillar to financial prosperity and stability. The study recommends the Government of Rwanda to develop policy and legal environment that is conducive to association of financial institutions.

FIFTH: KONSTANTINOS FALANGIS(2013)[1]:

This study argued that a Mathematical programming (MP) can be used for developing classification models for the two–group classification problem. An MP model can be used to generate a Discriminant function that separates the observations in a training sample of known group membership into the specified groups optimally in terms of a group separation criterion. The simplest models for MP Discriminant analysis are linear programming models in which the group separation measure is generally based on the deviations of misclassified observations from the Discriminant function.

MP Discriminant analysis models have been tested extensively over the last 30 years in developing classifiers for the two–group classification problem. However, in the comparative studies that have included MP models for classifier development, the MP Discriminant analysis models either lack appropriate normalisation constraints or they do not use the proper data transformation. In addition, these studies have generally based on relatively small datasets. This thesis investigated the development of MP Discriminant analysis models that incorporate appropriate normalisation constraints and data transformations. These MP models tested on binary classification problems, with an emphasis on credit scoring problems, particularly application scoring, i.e. A two–group classification problem concerned with distinguishing between good and bad applicants for credit based on information from application forms and other relevant data. The performance of these MP models compared with the performance of statistical techniques and machine learning methods and it shown that MP Discriminant analysis models can be useful tools for developing classifiers.

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[1]**KonstantinosFalangis**, 2013, Mathematical Programming models for classification problems with applications to credit scoring, Thesis Presented for the degree ofDoctor of Philosophy, University of Edinburgh.

Another topic covered in this thesis is feature selection. In order to make classification models easier to understand, it is desirable to develop parsimonious classification models with a limited number of features. Features should ideally be selected based on their impact on classification accuracy. Although MP Discriminant analysis models can be extended for feature selection based on classification accuracy, there are computational difficulties in applying these models to large datasets. A new MP heuristic for selecting features is suggested based on a feature selection MP Discriminant analysis model in which maximisation of classification accuracy is the objective. The results of the heuristic are promising in comparison with other feature selection methods.

Classifiers should ideally be developed from datasets with approximately the same number of observations in each class, but in practice classifiers must often be developed from imbalanced datasets. New MP formulations are proposed to overcome the difficulties associated with generating Discriminant functions from imbalanced datasets. These formulations are tested using datasets from financial institutions and the performance of the MP-generated classifiers is compared with classifiers generated by other methods. Finally, the ordinal classification problem is considered. MP methods for the ordinal classification problem outlined and a new MP formulation tested on a small dataset.

SIXTHS: HELÉNE AHLBERG (2012)[1]:

The purpose of this study was to describe how larger and smaller banks in Sweden are managing credit assessment of small businesses, and if this process differs according to the size of the bank. The authorsfurther want to investigate how expectations of new capital regulations, in form of Basel III, affect the credit assessment and if it is affecting the ability of small businesses to receive loans.

In order to meet the purpose of the thesis a mixed model approach used. The authors conducted semi-structured interviews with representatives from three smaller and three larger banks. Additional, statistics were computed in order to examine the economic

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[1]**HeléneAhlberg,** 2012, How do Banks Manage the Credit Assessment to Small Businesses and What Is the Effect of Basel III?An implementation of smaller and larger banks in Sweden, Master Thesis within Business Administration, JonkopingUniversity.

state of the Swedish market, where also an archival study with 10 allocated banks operating with corporate services was executed.

The thesis found that banks have a well-developed credit process where building a mutual trust relationship with the customer is crucial. If the lender has a good relationship with the customer, it will ease the collection of credible information and thus enhance the process of making right decision. The study examined minor differences between smaller and larger banks in their credit assessment. Currently, the banks do not see any problems with adjusting to the new regulation and thus do not see specific effects for small businesses and their ability to receive loans. The effects that can be identified by the expectations of Basel III are the banks' concern of charging the right price for the right risk and the demand of holding more capital when lending to businesses. The banks have come a long way on the adjustment to Basel III, which has pros and cons, thus it implies that banks are already charging customers for the effect of the regulations that will not be 100 percent implemented until 2019. The difference that was identified between larger and smaller banks is that larger banks seem to have more established strategies when working on the implementation of Basel III.

SEVENTH: CECILIA FALCK (2010)[1]:

The efficient market hypothesis asserts that share prices in capital markets always fully incorporate and reflect all information and that any new information immediately incorporated into the share price. According to the theory, the share price reflects the intrinsic value of an asset at any point in time, implying that it is impossible to persistently outperform the market by the use of information already known to the market. The theory however widely debated in the finance literature and numerous studies have disputed its accuracy (see e.g., Grossman and Stieglitz, 1980; Rosenberg, Reid and Lanstein, 1985). Even though the empirical results have been ambiguous, a large number of imperfections has identified in capital markets.

One imperfection recognized in contrast with the theory of efficient markets is the evidence of information asymmetry. Information asymmetry deals with the situation in

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[1] **Cecilia Flack,** *2010, are Cross-Listed Firms Subject to Less Information Asymmetries? A study of the Reaction to Change in Credit Scoring, Master thesis in finance, Stockholm School OF Economic.*

which companies have better information about the value of the company than its investors do. In situations of information asymmetry in capital markets, so-called principal-agent problems may arise between the parties. The principal-agent problem can occur because the two parties, the principal and the agent, may have different interests despite the fact that the latter performs actions on behalf of the former. In previous literature, corporate governance has identified as one of the key determinants of the behaviour of managers and choices of company policies. Corporate governance can defined as the set of processes, institutions, practices, and rule of law that influence the way a company managed and controlled. Corporate governance also includes the relation between companies and their stakeholders such as outside investors. When there are possible conflicts of interest between managers of companies and outside investors, corporate governance tools such as stringent disclosure requirements may reduce information asymmetry. Several studies have shown that corporate governance improved for company's cross-listed1 in the United States, as this enforces stricter disclosure requirements on foreign companies otherwise subject to less stringent requirements (see e.g., Khanna et al., 2004; Sami and Zhou, 2008).

EIGHTH: ANDREAS OSTLUND (2009)[1]:

This thesis addressed the question whether cross-listing companies in the United States improves the transparency of companies and provides investors with better information and thus reduces information asymmetry. This thesis rests on the assumption that investors demand a higher return premium for stocks subject to higher information asymmetry.2 As a proxy for improved information and better disclosure, we use the information content in changes in credit scorings. It has in several previous studies been shown that credit-scoring actions by the major credit scoring agencies provide capital markets with previously unknown information (see e.g. Chan, Edwards, and Walter, 2009; González et. al., 2004). To test the question addressed we will test the difference in impact of a change in credit scoring between cross-listed companies and non cross-listed companies. As a measure of the impact of a change in credit scoring, we will study any existence and magnitude of any abnormal equity returns around the

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[1] **Andreas Ostlund,** 2009, **the** *Relationship between Credit Scoring and Beta, Master thesis, Nordic University.*

time of the announcement of the change. In particular, the purpose of this thesis is to answer the following question:

Is cross-listing in the United States an effective corporate governance mechanism to reduce the information asymmetry between a company and its outside investors?

To address this question, we will test the following hypothesis:

H1 (Information content of scoring changes): The market does not fully anticipate all scoring changes and is hence associated with abnormal share price returns around the announcement of such events.

H2 (Differences between cross-listed and non cross-listed firms): The abnormal returns caused by a scoring event is smaller for cross-listed firms than for non cross-listed firms.

This thesis aimed to investigate whether foreign firms cross-listed in the United States are associated with less information asymmetry than firms that are not cross-listed. Based on the characteristics of cross-listed firms, e.g. that cross-listed firms are subject to the stricter U.S. disclosure requirements, we expected this group of firms to exhibit smaller abnormal returns associated with a credit scoring change as an indication of less information asymmetry. To test these implications, we have performed a multivariate regression analysis to compare the announcement returns of negative credit scoring changes for Brazilian firms cross-listed in the United States compared to domestically list Brazilian firms during the period 1996-2009. Opposite to our expectations, we find that the cross-listed firms in our study on average exhibit larger abnormal returns than the non cross-listed firms, implying that they experience more information asymmetry and hence are less transparent than non cross-listed firms are. We can thus not conclude that cross listing in the United States is an effective corporate governance mechanism to reduce the information asymmetry between a company and its outside investors. We have identified several possible explanations for this observed relation. For instance, we suggest that differences in disclosure requirements, ownership structure and shareholder types could explain the larger announcement returns for cross-listed firms.

The result revealed a moderate relationship between beta and credit risk, a relationship which was not statistically significant on the five percent level. Our results suggest that

credit scorings contain some information about companies' systematic risk, a finding that might be useful for market participants.

The primary goal of this thesis was to establish a relationship between beta and credit scoringson the Nordic stock market. Regression results indicate that a relationship exists, however it could not be demonstrated to be statistically significant at a five percent level. The connection between the variables became stronger when the unsolicited scorings were removed. The results were similar regardless if regression or one sample t-test were employed. This suggests that the scorings have informational value to the market, perhaps especially if the scorings are on the company's own behest. Information content hypothesis were therefore seemingly validated, the scoring agency appears to uncover new information. The rational explanation, which the authors of this thesis started out with, seems to hold water. Since a connection between the variable exist it does indicate that credit scorings work as a proxy for credit risk, which is indeed a part of the systematic risk. It was also attempted to exhibit a signalling effect using only one sector. While this sector, banking, had similar beta means it had lower standard deviation. This could indicate some signalling effect, but it is far more likely that they had more concentrated betas due to the nature of their business. Wealth redistribution effect could not be demonstrated, which was not

NINTH: SAMSUL ISLAM (2009)[1]:

Credit Decisions are extremely vital for any type of financial institution because it can stimulate huge financial losses generated from defaulters. A number of banks use judgmental decisions, means credit analysts go through every application separately and other banks use credit scoring system or combination of both. Credit scoring system uses many types of statistical models. Recently, professionals started looking for alternative algorithms that can provide better accuracy regarding classification. Neural network can be a suitable alternative. It is apparent from the classification outcomes of this study that neural network gives slightly better results than discriminate analysis and logistic regression. It should be note that it is not possible to draw a general conclusion

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[1]*Samsul Islam, 2009, Application of Artificial Intelligence to Assess Credit Risk: A Predictive Model For Credit Card Scoring, Thesis for the degree of Msc in Business Administration, Blekinge Institute of Technology.*

that neural network holds better predictive ability than logistic regression and discriminate analysis, because this study covers only one dataset. Moreover, it is comprehensible that a "Bad Accepted" generates much higher costs than a "Good Rejected" and neural network acquires less amount of "Bad Accepted" than discriminate analysis and logistic regression. So, neural network achieves less cost of misclassification for the dataset used in this study. Furthermore, in the final section of this study, an optimization algorithm (Genetic Algorithm) proposed in order to obtain better classification accuracy through the configurations of the neural network architecture. On the contrary, it is vital to note that the success of any predictive model largely depends on the predictor variables that selected to use as the model inputs. But it is important to consider some points regarding predictor variables selection, for example, some specific variables are prohibited in some countries, variables all together should provide the highest predictive strength and variables may be judged through statistical analysis etc. This study also covers those concepts about input variables selection standards.

The conclusion of the study is as following:

- Appropriate predictor variables selection is one of the conditions for successful credit scoring models development. This study reviews several considerations regarding the selection of the predictor variables. Moreover, using the Multilayer Perception Algorithm of Neural Network, network architecture constructed for predicting the probability that a given customer will default on a loan. The model results are comparable to those obtained using commonly used techniques like Logistic Regression or Discriminate Analysis.

TENTH: ROBIN WILISOO (2009)[1],

In this thesis, the focus lied on the determinants of changes in credit scorings. Multiple regressions used to study the relation between credit scorings and a quantity of selected economic variables. The study is restricted to the US market and the scorings have been assigned by Moody's during the period 1999-2008. In line with previous studies, the short-term interest rate and corporate profits are important determinants of

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[1]*RobinWilisoo, 2009, the Economic Sources of Change in Credit Scorings, Master thesis in economics, Lund University.*

scoring changes. The result shows that other important factors are the capacity utilization rate and the rate of inflation. Finally, evidence found that the number of scoring changes is pro-cyclical. This leads to the conclusion that if banks use the standardized approach in BIS II, bank capitals requirements will be adjustmore frequently when the economy is growing.

The main purpose of this thesis was to analyse credit scorings over time and search for the determinants of changes in credit scorings. Using the scoring drift and the scoring activity of US corporations from Moody's over the period 1999-2008, the influence of a quantity of economic factors examined with multiple regressions. In line with previous studies, the short-term interest rate and corporate profits are important determinants of scoring changes. These two economic variables are significant in explaining both the number of scoring changes as well as the direction in overall creditworthiness. Other important candidates are the rate of inflation, the capacity utilization rate, and the state of the business cycle. Since, the scoring activity is lower in recessions; it seems that there is indeed procyclicality in the number of scoring changes.

The estimated coefficients for all of the significant variables had the expected signs, except for the coefficient of the short-term interest rate. The result pointed out that the short-term interest rate has a positive relationship to the scoring drift in addition to the scoring activity. Hence, a higher interest rate is good for scoring upgrades and is associated with a higher intensity in the number of scoring changes. Generally, we would expect that the higher the interest rate, the more expensive it is for companies to borrow new capital. The result might have two reasons. First, the positive sign may come about due to sampling error. An alternative explanation is that the short-term interest rate is positively related to aggregate profits. Another interesting finding is that the CEO confidence index was insignificant in each model. Therefore, corporate leaders' subjective opinions about the economic conditions do not have a significant impact on scoring changes.

ELEVENTH: XUEZHEN WU (2008)[1]:

Under the framework of Basel II, banks allowed to use their own internal scoring-based (IRB) approaches for key drivers of credit risk as primary inputs to the capital calculation. In addition, regulatory validations of the internal scoring/scoring system are required. Assessing the discriminatory power and examining the calibration of a credit scoring systems are two deferent important tasks of validation. This paper discusses several commonly used statistical approaches for measuring the discriminatory power, calibration, and shows that such approaches should be interpret with caution. When the objective of the validation of a credit-scoring model is to confirm that the developed scoring model is still valid for the current applicant population, one should first check whether the portfolio structure changed over time or not. Because in some cases, significant shifts of the portfolio structure might happen.

When the objective of the validation of a credit-scoring model is to confirm that the developed scoring model is still valid for the current applicant population, one should first check whether the portfolio structure changed over time or not. In some cases where the development sample is two or three year's old, significant shifts of the portfolio structure might have occurred. It means that the scoring model compared on different portfolios, and then the validation result would become less meaningful.

With regard to assessing the discriminatory power of a credit-scoring model, the Receiver Operating Characteristic Curve and the area under the curve are the most commonly used tools. Although the Delong test is not applicable to comparing the AUROC on the same portfolio in different periods, we still could use it to calculate the confidence interval for the value of the AUROC.

With regard to the calibration of the scoring or scoring system, HosmerLemeshow and Spiegel halter test are available and easy to use because it can test the adequacy of the PD estimates with different number of scoring classes at the same time. However, their appropriateness strongly depends on the independence assumption for the default events. Furthermore, one should notice that due to the Insufficiency of the number of defaulters, the statistical validation is not always reliable.

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[1]*Xuezhen Wu, 2008, Credit Scoring Model Validation, Master thesis, University of Amsterdam.*

TWELFTH: BADER ELDEEN MUNIR (2007)[1]:

The researcher begins by looking more closely at an internal risk scoring system (IRRS). A typical IRRS will assign both an obligor scoring to each borrower (or group of borrowers), and a facility scoring to each available facility. A risk scoring (RR) is design to depict the risk of loss in a credit facility1. A robust risk scoring system should offer a carefully designed, structured, and documented series of steps for the assessment of each scoring.

The goal is to generate accurate and consistent risk scoring, yet also to allow professional judgment to significantly influence a scoring whenever appropriate. The expected loss (EL) is the product of an exposure (say US$100) multiplied by the probability of default (PD) (say 2%) of an obligor (or borrower) and loss given default (LGD) (say 50%), in any specific credit facility in this example, the EL is US$100*0.02*0.50=US$ 1. A typical risk scoring methodology initially assigns an obligor scoring that identifies the expected PD by that borrower (or group) in repaying its obligations in the normal course of business. Risk scorings quantify the quality of individual facilities, credits, and portfolios. If RR is accurately and consistently applied, then they provide a common understanding of risk.

Levels and allow for active portfolio management. An IRRS also provides the initial basis for capital charges used in the various pricing models. It can also assist in establishing loan reserves. The IRRS can be used to rate credit risks in most of the major corporate and commercial sectors, but it is unlikely to cover all business sectors.

This study primarily discusses a model developed by the author over 30 years ago, the so-called Z-Score model, and its relevance to these recent developments. In doing so, we will provide some updated material on the Z-Score model's tests and applications over time as well as some modifications for greater applicability. The major theme of this study is that the assignment of appropriate default probabilities on corporate credit assets is a three-step process involving from the development of:

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[1]**Bader EldeenMunir,** 2007, Internal Credit Risk Rating Model, A thesis submitted in partial fulfilment of the requirement for the degree of B.S Actuarial science and risk management, University of Khartoum.

(1) Credit scoring models,

(2) Capital market risk equivalents usually bond scorings, and

(3) Assignment of PD and possibly LGDs on the credit portfolio.

Our emphasis will be on step 1 and how the Z-Score model, (Altman, 1968), has become the prototype model for one of the three primary structures for determining PDs.

Table (1.1) Z-score criteria:

If Z-score is	Then the probability of failure of the firms is
Less than 1.8	Very high
Between 1.81 to 2.99	Not sure
Greater then 3.0	Unlikely

Finally he founds that the Internal credit risk scorings are utilized by many sophisticated banks to summarize the risk of individual credit exposures, and are increasingly incorporated into various banking functions, including operational applications (such as determining loan approval requirements) and risk management and analysis (including analysis of pricing and profitability as well as internal capital allocation). Internal scorings may also cover a much broader range of borrowers, providing assessments of the credit quality of individuals and small-to-medium sized companies through credit scoring, and assessment of larger non-rated borrowers through detailed analysis. internal scorings-based approach also shares certain similarities with credit risk models in terms of its reliance on banks' internal credit assessments, and in its conceptual measures of risk; as such, it could also provide incentives for banks to further refine credit risk management techniques, paving the way for a transition towards full credit risk models in the future. In this thesis the credit risk scoring of different companies and the assigning a risk grade for the purpose is to check the stability, solvency and to identify the overall level of risk associated with the capital structure, so long as the risk scoring structure and assignment procedure provide a meaningful and consistent identification of the risk. These scoring can also provide a valuable reference point for assessing degree of the trade-off among various loan terms and characteristics and, in particular, in determining appropriate loan pricing.

CHAPTER II

CREDIT REPORTING

2.1 INTRODUCTION:

Financial infrastructure broadly defined comprises the underlying foundation for a country's financial system. It includes all institutions, information, technologies, rules, and standards that enable financial intermediation. Poor financial infrastructure in many developing countries poses a considerable constraint upon financial institutions to expand their offering of financial services to underserved segments of the population and the economy. It also creates risks, which can threaten the stability at the financial system as a whole.

Certainly, credit-reporting systems are very important in today's financial system. Creditors consider information held by these systems primary factors when they evaluate the creditworthiness of data subjects and monitor the credit circumstances of customers. This information flow enables credit markets to function more efficiently and at lower cost than would otherwise be possible.

Yet, credit reporting addresses a fundamental problem of credit markets: asymmetric information between borrowers and lenders, which may lead to adverse selection, credit rationing, and moral hazard problems. Regulators and financial market participants are therefore, increasingly recognizing the value of credit reporting systems for improved credit risk and overall credit portfolio management, to enhance financial supervision and financial sector stability, and as a tool to enhance access to credit.

This chapter describes the nature of credit reporting elements, which are crucial for understanding credit reporting and to ensure that credit-reporting systems safe, efficient, and reliable. It intends to provide an international agreed framework in the form of international standards for credit-reporting system's policy and oversight. The principles for credit reporting deliberately expressed in a general way to ensure that they can be useful in all countries, and that they will be durable. These principles is not intended for use as a blueprint for the design or operation of any specific system, but rather suggest the key characteristics that should be satisfied by different systems, and the infrastructure used to support them to achieve a stated common purpose, namely

expanded access and coverage, fair conditions, safe and efficient service for borrowers and lenders.[1]

2.2 DEFINITION OF CREDIT REPORT:

Credit is the permission for a customer to have goods or services that will be paid for at a later date, or it is the reputation of a person or firm for paying bills or other financial obligations, or the recognition given for some action or quality; a source of pride or honour, trustworthiness, creditability.[2]

However, a credit report is a record of customer credit activities. It lists any credit-card accounts or loans customer may has, customer balances, and how regularly customer makes his payments. It also shows if any action has taken against him because of unpaid bills.[3]

Nevertheless, a credit report is a detailed record of a customer's credit history. Companies known as credit reporting agencies or credit bureaus maintain his credit report. Creditors and lenders use his credit report to determine customer's risk as a borrower.

It may contain some personal identifying information like customer name, current and previous address, and current and previous employers appear on his credit report.

Even so, a credit report includes data about credit accounts including credit cards and loans. Each account detailed with the account payment history, credit card or loan balance, credit limit or original loan amount, type of account, the date account opened, and whether the account has been delinquent. Accounts that have been sent to a collection are often, but always included on the credit report. Public records such as bankruptcies, tax liens, foreclosure, and lawsuit judgments appear on the credit report. Finally, credit report includes inquiries that are placed when customer make an application for credit.

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[1]*TullioJappelli and Marco Pogano, 2000, information sharing in credit markets: a survey, Centre for Studies in Economics and Finance, working paper n.36.http://ideas.repec.org/p/sef/csefwp/36.html*
[2]*Steven Bucci, 2008, credit repair kit for DUMMIES, second edition, Wily publishing, Canada, p 88.*
[3]*http://www.frbsf.org/publications/customer/creditreport.html*

Not everything about customer could found on his credit report. His race, marital status, religious beliefs, political affiliation, savings or checking account information, and arrest records are not on his credit report.[1]

It is also demonstrates how a borrower has handled credit and pattern of how the borrower uses credit. A credit report is a listing of the accounts receivable as reported by various firms that have extended credit to borrower. If it shows when a bill paid in relation to when the due date for the payment was expected. It lists debts, payment history, banks, credit card and companies, and department stores; it shows the history of tax liens or bankruptcy.[2]

Furthermore, credit reporting is an enforcement tool, which reports the amount of an obligor's delinquency to credit agencies (credit agencies also called customer reporting agencies or credit bureaus). This information goes on the obligor's credit history. Banks and other lending institutions when considering the obligor for loans and credit review the credit history. Some employers also review credit histories when making hiring decisions, also credit reporting process largely automated. Workers become the involved when either the obligator requests a credit-reporting review, or a case identified as one, which should not reported.[3]

Generally, a customer credit report is the organized presentation of information about, and an individual's credit record that credit-reporting agencies communicate to that requesting information about the credit history of an individual. It includes information on an individual's experiences with credit, leases, non-credit-related, bills, collection agency actions, monetary-related public records, and inquiries about the individual's credit history scores derived from the records of credit report agencies, have long been consider one of the primary factors in credit evaluations and loan pricing decisions. They are also widely used to select individuals to contact for pre-screened credit solicitations. More recently, credit reports and credit history scores have often been use in identifying potential customers for property and casualty insurance and in underwriting and pricing such insurance.

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[1] *http://credit.about.com/od/glossary/g/creditreport.htm*
[2] *Credit reporting literacy: customers understood the basics but could benefit from targeted educational efforts, 2005, report to congressional committees, United States Government Accountability Office*
[3] *Credit reporting, 1997, LOWA department of human services, employees manual, title 11, chapter C.*

In most cases, credit-reporting agencies collect information from, reporters, creditors, governmental entities, collection agencies, and third-party intermediaries. They generally collect data every month, and they typically update their credit records within one to seven days after receiving new information.[1]

The customer who has applied for, uses credit, or has a public record has a credit report. The report verifies financial and account-related information, such as current employment, use and types of credit, collections, and reported legal encumbrances. This information updated to credit bureaus monthly by credit grantors, courthouses, and collection agencies. Among the methods for data-gathering data are accounts receivable tapes, manual credit updates from computer terminals, inquiries via remote terminals, and customer relations systems.

Even though, any creditor can report information to a credit bureau as long as quality standards met, creditors must show proof of permissible purpose to obtain a credit report for evaluation.[2]

A customer credit system allows customers to borrow money or incur debt, and to defer repayment of that money over time. Having credit enables customers to buy goods or assets without having to pay for them in cash at the time of purchase. Having a good, credit record means that a person has an established history of paying back 100% of his/her debts on time. I believe that, a person with good credit will be able to borrow money more easily in the future, and will be able to borrow money at better terms. On the other hand, having a bad credit record means that a person has had difficulty in the past with paying back all of the money he owes, or with making payments on time. Lenders are less likely to loan more money to a person with bad credit, making it difficult for that person to buy a car, a house, or obtain a credit card. Access to credit is a valuable benefit, which a person should protect and manage wisely.

A credit report is a record of a customer's credit history that includes information about:

[1]*Robert M.Hunt, A century of customer credit reporting in America, 2005, World Bank, study department, working paper no. 05-13.*
[2]*Elizabeth Mays, 2006, (Developing, Validating, and Implementing Credit Scoring), India, the Glen lake Publishing Company, Ltd.*

❖ **CUSTOMER'S IDENTITY:**

Customer name, address, full or partial social security number, date of birth, and possibly employment information.

❖ **EXISTING CREDIT:**

Information about credit that customer has, such as his credit card account, mortgages, car loans, and student loans. It may also include the terms of his credit, how much he owes the creditors, and his history of making payments.

❖ **PUBLIC RECORD:**

Information about any court judgments against a customer, any liens against his property, or whether he has filed for bankruptcy.

❖ **INQUIRIES ABOUT CUSTOMER:**

A list of companies or persons who recently requested a copy of a customer's report.[1]

2.3 THE COMPONENTS OF THE CREDIT REPORT:

2.3.1 CUSTOMER CREDIT FILE:

The "customer credit file" is the core product offered by the credit bureau to its clients, or "subscribers." This product is simply a report, furnished to clients, divulging any or all of the pertinent demographic and credit data contained in the main database. For the purpose of helping creditors to determine the creditworthiness of a particular applicant for credit, the available data to be furnished in a customer credit profile, most of which is available would include the following:[2]

2.3.2 IDENTIFICATION:

Identifying information such as name, address, social security numbers, and employment data (other than salary).[3]

2.3.3 NAME AND ANY VARIATIONS:

Credit report could contain different versions of and even misspellings of customer's name. For example, first and last name might appear along with his first and

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[1] *United States of America, credit reports, and credit scores, BOARD of GOVERNANCE of the FEDERAL RESERVE SYSTEM.*
[2] *Credit bureau business plan "OKRAINE", 2006, USAID.*
[3] *D.L. Grogan and B.C.Buzz, 2011, Mortgage Loan Brokering and Lending, California, USA*

last name with his middle initial. If creditors have misspelled customer's name, that misspelling could be on his credit report.

2.3.4 CURRENT AND PRIOR ADDRESS INFORMATION:

If a customer received mail at more than one address, there is a great possibility all those addresses will be on his credit report. Of course, if there is an address where the customer never lived appearing on his credit report, he could dispute it. It does not hurt his credit report, but could a sign of identity theft.

2.3.5 CURRENT AND PRIOR EMPLOYMENT INFORMATION:

The name of the customer's employer might be on his credit report. However, it might not be. It does not influence his credit report, but may help lenders and credit card issuers verify the information on customer's loan or credit card application.

2.3.6 REVOLVING ACCOUNTS

Revolving accounts are credit accounts with balances that can go up and down. The most common type of revolving account is a credit card. A line of credit is another type of revolving account.

2.3.7 OPEN AND CLOSED ACCOUNTS:

Open and closed accounts will both appear on customer's credit report, except negative, closed accounts that are older than seven years. Accounts that closed in good standing may stay on his credit report about ten years after the account has closed.

2.3.8 ACCOUNT PAYMENT HISTORY:

The complete payment history for customer's credit accounts will be on his credit report, except negative payment history that is older than seven years. Typically, only the last 24 months of payment history will appear on customer's credit report, but old past due payment statuses may be included in the notes section for that account.

2.3.9 RECENT CREDIT AND LOAN APPLICATIONS:

Recent applications for credit will appear on customer's credit report in the inquiries section. These inquiries only remain on his credit report for 24 months.

2.3.10 INDIVIDUAL LOAN INFORMATION:

Containing the following:

- ❖ Name of creditor.
- ❖ Relationship of subject profile to transaction (e.g. individual loan, joint loan, co signer, etc).
- ❖ Account or loan number.
- ❖ Type of loan (e.g. revolving credit, automobile loan, mortgage, other...).
- ❖ Original data of loan or data account opened.
- ❖ Original amount of loan or amount of credit line.
- ❖ High credit attention (for revolving accounts).
- ❖ Term of loan (for example, 12 month, revolving, on demand, other...).
- ❖ Term of amount of loan (periodic payment amount).
- ❖ Balance of loan.
- ❖ Past due amount.
- ❖ Date information reported (month and year).
- ❖ Manner of payment (MOP): status of loan.
- ❖ Date of last paid.
- ❖ Historical pay history of loan.
- ❖ Number of months reported in historical pay history.
- ❖ Field for comments.

2.3.11 PUBLIC RECORD INFORMATION PERTAINING TO PAST OR PRESENT CREDIT TRANSACTIONS:

The data that underline most generic credit history come from the files of credit reporting agencies. The credit records contain four types of information:

The first type "trade line" information, which includes the details provided by creditors (and some other entities such as utility companies) on current and past loans, leases, and non-credit-related bills. This information includes the type of account (closed-or open-ended loan), the purpose of the account (for example, automobile loan, mortgage, and student loan), the historical payment performance on the account, and details about account derogatory (such as whether the account has been changed off or is in collection, is associated with a judgement, bankruptcy, foreclosure, or repossession).

The second type of information comes from monetary-related public records and includes records of bankruptcy filings, liens, judgements, and some foreclosures and lawsuits. The data distinguish between tax and other liens, though (unlike credit account data) the public record data do not provide a classification code for the type of creditor or plaintiff. Although, public records include some details about the action, such as the data filed the information available is much narrower in scope than that available on credit accounts.

Information on non-credit-related bills in collection that reported by collection agencies constitutes the third type of information. These collection actions most commonly involve unpaid bills for medical or utility services. Collection agency records include only limited details about the action, including the date acquired by the collection agency, the original collection balance, and an indicator of whether the collection has paid in full. There is no code including the type of original creditor or the date the account opened or first became delinquent.

Finally, the fourth type of information reflects requests for information from an individual's credit record. Each time an individual or company requests information from an individual's credit record, an inquiry record created. Only inquiries by creditors following an application ("hard" inquiries) are included in credit report; inquiries for account management or solicitation purposes are not considered. The data on inquiries maintained for two years and record only the type of firm making the inquiry, the data on which it made, and the purpose of the inquiry.[1]

Public records suffer from similar consistency and duplication problems that affect collection items. In particular, a single episode can result in one or more public record items depending on how it recorded. For example, tax lines can recorded on a consolidated basis or treated as separate items. Similarity, amendments to a public record filing, such as a bankruptcy or a foreclosure, can treated as update, which result in no change in the number of items, or as new filings.[2]

Thus, public record includes the following:

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[1] *Robert Bravery and Kenneth P.Brevort, 2010,Dose credit scoring produce a disparate impact?, Financial and Economic Discussion Series, Divisions of Study and Statistics and Monetary Affairs, Federal Reserve Board, Washington D.C.*
[2] *above No13*

- ❖ Name of authority reporting record.
- ❖ Type of record being reported (e.g. civil judgment, mortgage, etc.).
- ❖ Plaintiff or lien granted.
- ❖ Amount of judgment or lien.
- ❖ Status of judgment or time (active or satisfied).
- ❖ Field for comments.
- ❖ Payment pattern report that shows monthly rating back for two years.
- ❖ Bankruptcy.
- ❖ Repossessions.
- ❖ Foreclosures.
- ❖ Tax liens.

2.3.12 OTHER INQUIRING PARTIES INCLUDING:

Inquiries made by others, for instance, mortgage lenders or banks, about customer's credit histories, including:

- ❖ Date of inquiry.
- ❖ Name of inquiry.
- ❖ Type of lender (e.g. bank, retail merchant, etc).
- ❖ Phone number or subscriber code.[1]

2.4 CREDIT INFORMATION:

A credit bureau gathers and maintains the information about customer's that is included in their credit reports, then provide their information in the form of a credit report to companies or persons that request it, such as lenders from whom customers are seeking credit.

Credit bureaus get information from creditors, such as banks, credit-card issuers, or auto finance companies. They also get information from different sources so the information in one credit bureau's report may not be the same as the information in another credit bureau's report.[2]

2.4.1 INFORMATION QUALITY:

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[1] *http://credit.about.com/od/creditreportscoring/tp/information-on-credit-report.htm*
[2] *above No15*

Information quality is the basic building block of an effective credit-reporting environment. Accuracy of data implies that such data is free of errors, truthful, complete, and up to date. Inaccurate data may lead to numerous problems, including unjustified loan denials or higher borrowing costs. Quality also means that data is sufficient and adequate, implying that:

- Relevant detailed information captured, including negative as well as positive data.
- Information from as many relevant sources gathered, within the limits established by law.
- Information is sufficient in terms of the period over which observations are available.[1]

The credit reporting code should promote data quality by setting out procedures to ensure consistency and accuracy of credit reporting information. These procedures should deal with matters including:

- The timelines of the reporting of credit reporting information.
- The calculation of overdue payments for the credit reporting purposes.
- Obligations to prevent the multiple listing of the same debt.
- The updating of credit reporting information, and;
- The linking of credit reporting information relating to individuals who may or may not be the same individual.[2]

2.4.2 CREDIT INFORMATION SHARING:

A credit bureau characterized by the voluntary exchange of information among lenders. The bureau collects the information provided by its members and combines it with other sources to produce an applicant's credit report. Credit bureaus based on the principle of reciprocity; only those lenders, who comply and provide adequate and timely information on their debtors. The economic authorities, on the other hand, set up public credit registries (PCRs), and participation is compulsory. Lenders required by law to provide information to the Public credit registry (PCR), and in turn, they are allowed access to consolidated credit information.

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[1] above No 8
[2] Australian privacy law and practice report, 2008, Australian law reform commission, report 108, volume 1.

The entry point for inquiry is the sharing of positive data by creditors. That is, how the sharing of positive data does change lending and loan performance in a society, and what factors must considered and measures taken if a society is to share positive data? Before we move on to examining these issues, it is useful to note hoe the sharing of positive and negative data differs practically from the sharing only negative data.

The information shared among lenders can be for two main types; negative information refers to defaults or arrears, while positive information includes detailed reports of the applicant's current assets and liabilities, income and employment, and guarantees in which the applicant is involved.

Information that credit-reporting agencies maintain on customer's credit-related experiences plays a central role in credit markets. Creditors consider such data a primary factor when they monitor the credit circumstances of current customers and evaluate the creditworthiness widely agree that the data enable domestic customer credit markets to function more efficiently and at lower cost than would otherwise be possible.

Despite the great benefits of the current system, however some analysts have raised concerns about the accuracy, completeness, timeliness, and consistency of customer credit records, and about the effects of data limitations on the availability and cost of credit. These concerns have grown as creditors have begun to rely more on "credit history scores" (statistical characterizations of an individual's creditworthiness based exclusively on credit record information) and less on labour-intensive reviews of the detailed information in credit reports. Moreover, decision makers in areas underwriting of property and casualty insurance, increasingly depend on credit records have predictive value.[1]

Government agencies across the world increasingly are searching for new ways to prevent and solve crime, particularly crimes associated with terrorism. These new methods include new forms of intelligence gathering and the sharing of personal information, often across state, territory, and national borders.

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[1]*Margaret J.Miller, 2003, credit reporting and the international economy, ASCO typesetter, USA*

2.4.3 FULL-FILE PAYMENT INFORMATION VERSUS NEGATIVE-ONLY DATA:

A common assumption is that lenders only need to know of any serious delinquencies on an applicant's other accounts to make an effective credit decision. The limitations of such assumptions, however, may be considerable.

First, this approach does not capture many moderately late payments (30+ or 60+ days past due) that are considered insignificant. Yet, these late payments, although short of an industry-defined level of default, are often telling indicators that a borrower may be seriously late with future payments. That is, minor delinquencies are often predictive of major ones, and their inclusion can improve the accuracy of the loan decision.

Second, negative-only reporting overlooks positive information, which offers a low-cost method of gathering data on applicants who have paid in a timely fashion, and it provides information on those who may be deliberately shut out of the market, such as lower income borrowers, women, racial minorities, and the young. Reporting positive information not only expands access, but it also creates fairer access to credit simply because more information allows lenders to make decisions that are more informed and not ration credit. Evidence also suggests that full-file reporting deters discrimination because loan denial to qualified applicants who are members of underserved communities becomes more difficult to justify.

Third, full-file reporting allows creditors to determine how many lines of credit a potential borrower already has and, in many cases, the associated balances, and credit limits. This enables the creditor to better gauge the potential borrower's credit capacity and true level of indebtedness, thereby reducing the chances of extending too much credit, resulting in over indebtedness. Therefore, broader information reporting is an important protection against credit overextension or over indebtedness.

Furthermore, Systems that only report serious delinquencies only (one that are "negatively") do not capture many moderately late payments (30 to 60 days past due) that are often indicative of borrower's risk. In addition, they do not include positive credit information (including on-time payments) which provides information that a person may be a good risk, as either the lack of negative information could mean that, or simply that the person has no payment or credit experience. Negative only systems

generally do not include data that allow creditors to measure a borrower's capacity to carry a loan and prevent overextension by revealing the individual's existing lines of credit, associated balances, and credit limits.[1]

2.4.3.1 FULL-FILE REPORTING:

The case for comprehensive or positive credit reporting generally relies on the argument that more information leads to closer pricing for risk, more competitive credit markets, increased availability of credit and better quality lending decisions. Overseas experience suggests that positive credit reporting would lead to finer segmentation of customers and closer pricing for risk. As it currently stands, most credit card issuers offer a single interest rate per product, regardless of customer's creditworthiness.

Positive credit reporting may also lead to the increased availability of lending to previously excluded borrowers at higher interest rates than 'mainstream 'borrowers, who may experience a higher default rate. The development and significant growth of the sub- prime mortgage market in the United States can be in part, attributed to comprehensive e credit reporting. While this has afforded access to home ownership to a greater number of people, it has also exposed these customers to the declining housing market. While delinquencies have risen for all mortgage categories in the United States, the strongest growth has been in the sub- prime market.[2]

There is no exact definition for what constitutes full-file data or fair-file data or other sharing of some positive data, and while negative-only may be differences across countries and only data actually collected across countries and bureaus. The first of possible positive data fields on an account extensive:

- All negative data, but also.
- The loan amount.
- Outstanding balance.
- Timelines of payment.
- The interest rate.

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[1] *Michael turner, Robin Varghese, 2007, A centre for competitive credit white paper, http://perc.net/files/downloads/WEB_Brazil_White_Paper_full_study.pdf?bcsi_scan_B895EDBE82A4796 2=1*

[2]*Review of privacy: credit reporting provisions, 2007, submission to the ALRC, issues paper no.32*

- Maturity.
- Loan type.
- The type of collaterals.
- The value of collaterals.
- The loan rating.
- Account balance.
- Account type.
- Average age of account.
- Credit limit.
- Debt ratios (e.g., revolving to total debt).
- Delinquencies (30+ but sometimes less such as 15+).
- Inquiries.
- Instalments.
- Lenders.
- Portion of accounts repossessed/ written off.
- Other public record data.[1]

The list is not necessarily complete, but it does indicate the fact that there is considerable "positive" data associated with a line of credit. The bureau collected, especially in systems with private bureaus in very few economics. Yet, the inclusion of interest rate data is not necessary for system to even considered full-file.

As noted above, other categories of positive information (for example, interest rates) not seen as necessary for a system to considered full-file. The provision of positive data, whether full-file or less than full-file, is practically distinct from the provision of negative only information in more than the trivial sense, namely, that more information is provided.

From the perspective of the practice of data sharing, this fact means that data on an individual's financial activity not shared, as the vast majority of activities of borrowers do not qualify as the set of "events" that would trigger reporting. In short, at any given time, very little of any information on an individual is transferred from one database to one or more other databases.

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[1]*Michael A. turner, and Robin Varhese, 2010, the economic consequences of customer credit information sharing: efficiency, inclusion, and privacy, PERC (results & solutions).*

The practice of positive information sharing differs significantly from negative information sharing in this respect, that is, in terms of how often individual's information shared across databases. Even limited information sharing means that information reported during the reporting interval, even if account balances do not change.

Also from the point of view of practice, positive reporting systems are more likely to be automat than negative only systems are "events" driven. When a negative event occurs, the lender or other service provider reports on the data subject to a bureau, and, as mentioned, for any given data subject, these instances are likely to be rare. These credit and service providers largely report negatives in a manual fashion.

By contrast, in positive reporting systems, data subjects reported on far more frequently. As a result, reporting in an automated fashion is more likely, as it tends to be less costly than manually reporting the data volumes found in a positive reporting system. In summary, in systems where positive data reported, there is more data reported. Furthermore, this data is likely to be report in an automated manner.[1]

2.4.3.2 NEGATIVE ONLY REPORTING:

Negative only systems are "events-based", meaning the provision of information is triggered by specific occurrences, notably the failure to pay an account in a sufficiently timely fashion (a delinquency), or the abrogation of a borrower's responsibilities to pay off the debt (a default) or the legal discharge of the obligation to pay (bankruptcy), or the legal order to pay and until paid the placement of a legal hold on any transfer of assets (a lien).For most borrowers, these events are rare, and in fact some (e.g. bankruptcies) are never experienced.[2]

It is usually comprises:

- Applications.
- Bankruptcies.
- Defaults.

[1]Lessons from around the world to guide customer credit reporting reform in Australia, 2008, Decide with Confidence (D&B)
[2] Credit reporting of the base of the pyramid; key issues and success factors, 2011, Access to Finance FORUM, Reports by CGAP, ITS,and IFC, Washington

- Delinquencies (60+ days, sometimes 90+ days only).[1]

2.5 THE IMPORTANCE OF CREDIT REPORTING SYSTEMS:

Credit reporting solves the problem of information asymmetry between borrowers and lenders. The primary results of greater sharing of credit information include sustained growth in lending to the private sector, and the resultant increases gross domestic product (GDP), productivity, and capital accumulation. Credit reporting has also increased fairness in lending, owing largely to the greater ability of customers to rely on their credit and repayment history rather than assets as collaterals, and automated underwriting. Credit reporting, has effectively enabled groups of borrowers that have traditionally faced systemic bias to more easily access affordable mainstream credit.[2]

According to the theoretical literature, the answer lies in the problem of asymmetrical information: borrowers know much more than lenders about their own ability and willingness to repay. The asymmetry may work to the advantage of bad borrowers, but it is the interest of lenders and good borrowers to overcome the problem. Reasons for why lenders would want to do so are obvious, but good borrowers also benefit because public knowledge of their good payment histories lead to better access to lower-priced loans, especially in an environment where there are several competing lenders.[3]

Moreover, credit reporting addresses the fundamental problem of credit markets, By providing an efficient mechanism for evaluating risk, accurate credit information enables credit markets to function more effectively and at a lower cost than would otherwise be possible. Regulators and financial market actors therefore increasingly recognise the value of credit reporting systems for the improved management of credit risk and as a tool to enhance access to credit, thereby contributing to sustainable economic growth and financial sector stability. When assessing the need for more regulation, however, it should noted that credit-reporting systems are networks

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[1] *Paul M.colleir, 2009, fundamentals of risk management for accountants and managers "tools and techniques", Elsevier Ltd, Oxford, UK.*
[2] *Michael A. Turner and Robin Varhese, 2011, customer credit reports: measuring accuracy and dispute impacts, POLICY and ECONOMIC STUDY COUNCI, (PERC) press.*
[3] *http://www.mirainform.com/index.php?load=aboutus&act=aagency*

combining different industries for the benefit of more efficiency and security, and excessive regulation can work against the very objective of stable and efficient financial markets.[1]

2.5.1 BENEFITS OF THE CREDIT REPORTING SYSTEM:

2.5.1.1 FACILITATE CUSTOMER ACCESS TO CREDIT:

The importance of customer credit markets to the strength and resiliency of the economy is a direct consequence of the credit reporting system. Credit markets facilitate and extend economic expansion by reducing liquidity constrains, credit markets help to translate customer optimism into real economic activity, in fact, it facilitates the following:

- Easier access to credit (for compliant borrowers or previously excluded groups of customers) if the data available is accurate and up-to-date.
- Contribute to obtaining a price that reflects better their individual circumstances.
- Help them to understand the need to manage their credit.
- Enhance responsible borrowing.
- Prevent over-indebtedness.
- Reduce the need to provide extensive physical proofs for evidence.
- Reduced probability of over-extending.
- Reduce the use of guarantees.
- Reduced credit discrimination.
- Reduce use of guarantees.
- Support understanding of credit management.
- Potentially easier access to credit.
- Potentially better prices (for good credit risks).
- Fairer prices.
- Credit offers reflect credit risk and credit capacity.
- Expand their access to wide range of (affordable) services and products (for compliant borrowers).[1]

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[1] *Elena Pyykko, 2012, credit reporting: towards better access to credit and protection for customers, European Credit Study Institute, ECRI commentary no.9.*

2.5.1.2 MORE ACCURATE DECISION-MAKING:

Because credit reports compiled over time, from a wide range of sources, and updated daily, creditors (as well as insurers, employers, and other businesses with a permissible purpose) can see a far more complete picture of present and past credit behaviour. These data, reflecting a borrower's own past payment history, replace face-to-face attempts to evaluate character and capacity (common a generation ago) with a less invasive, more accurate assessment based on documented prior behaviour. Lending decisions are faster and more equitable. There is less opportunity for the loan decision to be influence by factors other than how the borrower has handled credit in the past, and standardized credit report data make it easier for regulators to verify compliance with anti-discrimination and other lending laws.

Credit reporting thus improves the performance of the entire market, lowering the cost of making credit available and increasing the number of customers who qualify for credit.

Furthermore, credit reports allow lenders to be proactive in preventing debt problems, even for existing accountholders. By providing a comprehensive picture of all of the borrower's credit accounts, credit report data allow creditors to prevent overextension. Through:

- Reduction of delinquencies and defaults.
- Reduction of information asymmetries.
- Reduction of collaterals request.
- Amelioration of credit portfolio.
- Facilitation of credit application process.
- Sustainable & affordable growth into new markets.
- Support/ enhance responsible lending.
- Measure and price the underlying risk on an account objectively.
- Gain better understanding of the credit history of customers.

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[1]*The importance of the national credit reporting system to customer and U.S. economy, 2003, subcommittee on financial institutions and customer credit of the committee on financial services, U.S. house of representatives, U.S. government printing office, Washington, serial no. 109-26.*

- Effectively manage cross-institution exposures.
- Help institutions increase segment specialisation and markets products better.
- Process credit application easier, faster, cheaper and with more control and consistency.
- Enhance credit risk management practices in line with global best practices.[1]

2.5.1.3 ENHANCED COMPETITION:

Because it dramatically reduces the cost of assessing the risk of new borrowers, credit report information encourage sentry by new lenders and greater competition. A significant obstacle to new entry into an established loan market is the prospect that the only customers interested in the new lender's product are the ones who have rejected by other lenders because of their higher risk. This problem of adverse selection can sharply limit the number of competitors in a market, especially if information on borrowers' past credit experience is costly to obtain. Credit report information lowers those costs .The more detailed the credit history available to new entrants, the more competitive will be the market for new loans.

The use of credit report data to pre-screen borrowers and target desirable prospects provided the jet fuel for acceleration in card offerings and competition .The wave of new entrants to the credit card market put increasing down ward pressure on the finance charge rate and annual fees charged by existing issuers. Incumbent credit card issuers saw attrition escalate, particularly among their lower-risk customers .Competitors knew no geographic boundaries and their offers reached customer mailboxes from thousands of miles away. All of this was possible because credit bureau data could be used to assess the risk of potential new customers, negating some of the advantages of the incumbent issuers. The ability of new entrants to use personal information to establish and cultivate relationships with customers thousands of miles away has transformed the competitive landscape for credit cards in the United States. Injecting intense price and service competition into a market that had not been historically noted for either .New entrants not only triggered a dramatic reduction in credit card pricing, but also substantially broadened access to the bank credit card product to millions of higher-risk

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[1] http://www.transunion.com/docs/rev/aboutTransunion/maximizing_the_Benefits_from_Credit_Reporting%20_Michael_Staten.pdf?bcsi_scan_B895EDBE82A47962=1

households .The largest increases in card ownership occurred in the lower income segments of the population.

2.5.1.4 CATALYST OF PRODUCTIVITY GROWTH:

Portable credit "reputations" give customers greater mobility and enhance their ability to respond to change. By increasing customer's mobility as a society. The credit reporting system under the FCRA has improved the efficiency of U.S labour markets, so that structural shifts within the economy can cause temporary disruptions within crippling long-term effects. There is less risk associated with serving old relationship and starting new ones, because objective information is available that helps us to establish and build trust in new locations more quickly.[1]

2.5.1.5 PREVENTING DELINQUENCIES AND DEFAULTS:

Comprehensive credit reports allow customers to establish a reputation for handling credit responsibly. To the extent that customers recognize the link between their credit opportunities and the content of their credit reports, the reporting system has a powerful and beneficial side effect: it reinforces borrower incentives to manage credit wisely and avoid delinquencies and defaults. In this way, credit reporting improves the performance of the entire market and lowers the costs of making credit available .In competitive credit markets these cost savings translate to lower prices and greater product availability to customers.

An under-appreciated aspect of the reporting of positive credit information is that it allows lenders to be proactive in preventing debt problems, not only in the application phase but also for existing accountholders. Credit reports that take into account the full breadth of a borrower's obligations (as well as past payment history) allow creditors to detect overextension. Because the comprehensive credit reports give lenders a broad picture of a borrower's changing financial circumstances, credit scoring is used by many lenders to determine appropriate intervention for borrowers headed for financial trouble, including possible recommendations for credit counselling assistance.

In addition, full-file credit reports give financial regulators a valuable tool for assessing the quality of bank assets and compliance with fair lending laws. As part of the

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[1] *http://www.beustring.com/articles/importance-of-credit-reporting/*

regulatory responsibility to ensure safety and soundness of the banking system, bank examiners can inspect samples of loans from a lender's portfolio and use the information from credit reports and credit scores in each loan file to evaluate the lenders' underwriting procedures. Loan samples with credit reports and scores can help the examiner determine the quality of the bank's assets and the adequacy of capital.[1]

2.5.1.6 CREDIT AVAILABILITY AND ECONOMIC RESILIENCY:

Customer credit allows households to transfer consumption from periods where household income is high to periods where income is low. This is particularly important for householders early in the life cycle, when the demand for housing, durable goods and education is relatively high, and incomes are relatively low but expected to rise over time. However, it is also important for households weathering temporary income disruptions or unexpected expense shocks. Because the comprehensive content of credit reports has allowed creditors to extend loans and establish lines of credit for a much wider segment of the population, compared to other countries, tens of millions of households have access to a credit "bridge" that can sustain them through temporary disruptions and declines in incomes.

The availability of customer credit to bridge income disruptions has important macroeconomic implications. Cross-country studies have found that credit availability and consumption fluctuations linked. Customer spending is more sensitive to income changes in countries with less-developed customer credit markets, especially during periods of tighter credit constraints. Credit markets that make loans accessible to large segments of the population provide a cushion that neutralizes the macroeconomic drag associated with temporary declines in income, lowering the risk of outright recession and reducing the magnitude of downturns when they do occur.[2]

2.5.1.7 DECREASES LOAN COST AND PROCESSING TIME:

Comprehensive credit reports have improved the competitiveness and efficiency of credit markets. Led to powerful improvements in risk management technology "like

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[1] *http://dnb.co.nz/library/scripts/objectifyMedia.aspx?file=pdf/56/66.pdf&siteID=3&str_title=The%20benefits%20of%20comprehensive%20credit%20reporting.pdf&bcsi_scan_B895EDBE82A47962=IkIUYowdxVqWLVNiXPb0mgouoIQ4AAAA3i8jgg==:1*

[2] *Philippe Bacchetta and Stefan Gerlach, 1997, consumption and credit constraints international evidence, JOURNAL of MONETARY ECONOMICES, New York 40 (1997) 207-238.*

credit scoring," and created more product choices and better tools for assessing and managing risks, thereby avoiding delinquencies and defaults. All of this ultimately lowers the cost of credit to customers.

Furthermore, Credit reports present customer information in a user-friendly format, thereby speeding up the decision-making process and turnaround time for loans. Ultimately, this results in a reduction in the transaction cost of loans, which can be passon to the customer in the form of lower interest rates.

2.5.1.8 PUBLIC SAFETY AND SECURITY:

Credit reports have proved a useful and convenient way to check for past criminal convictions when employing school bus driver, childe-care workers, security guards, and people to fill other sensitive positions. They provide an increasingly important tool for preventing financial fraud, because they contain a comprehensive picture of an individual's financial dealings, information that can be use to crosscheck and verity identities. They are also becoming an increasingly potent weapon in the fight against identity theft and terrorist threats.

Without a doubt, good borrowers would not be in advertently penalized (which might lead them to abandon their good behaviour) and bad ones would be given an incentive to improve, or could even be accommodated at a higher interest rate. In turn, the higher confidence among lenders would result in greater credit availability for everyone, a situation that enhances economic growth.

At various points in their lives, most people will need to submit a report of their credit for review. A credit report is a complete compilation of an individual's debts, loans, and bankruptcy filings. An institution, such as a bank, will generally look at someone's credit report when that individual is planning to make a significant purchase for which he do not currently have the funds, requiring a payment plan. Any questionable or negative activity on a credit report may disqualify someone from receiving the support that he need. This is especially relevant with regard to false credit reporting, which is illegal and may require the victim to take legal action.[1]

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[1]*Rowena Olegario, credit reporting agencies: their historical roots, current status, and role in market development, university of Michigan business school, www.nacm.org.*

2.5.1.9   REDUCES THE NEED FOR "PHYSICAL COLLATERAL":

Instead of relying exclusively on pledged cash or assets, a credit report enables lenders to base credit decisions on "reputational collateral." People with a strong borrowing history but little physical collateral are thereby able to access loans that would be otherwise unavailable.

2.5.1.10 ENABLES THE "UNBANKED" TO HAVE A CREDIT HISTORY:

Credit bureaus enable the creation of a credit history for people who access public services (for example, utilities, telephone companies) but have not yet ventured into the formal banking system. This non-bank credit history can be instrumental in obtaining a first-time loan.

2.5.1.11   LOWERS INTEREST RATES OVER THE LONG TERM:

Credit bureaus give lenders information about customers, therefore lowering their risk of lending. Lenders use this information to get more accurately assign interest rates to borrowers, which can make lending more affordable to customers.[1]

2.5.1.12   FOR AUTHORITIES:

- Access to data on state of financial market.
- Improve systemic financial stability.
- Collection of information for statistical purposes.
- Tool to prevent over-indebtedness. Improve access to accurate and timely data about the state of the financial market.
- Improve access to accurate and timely data about the state of the financial market.
- Promote sound development of the national credit system.
- Foster the sound and prudent management of reporting institutions by providing them with credit portfolio.
- Facilitate the detection and prevention of fraud and other crimes.
- Help them obtaining useful information for statistical and other legally based purposes.

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[1] *http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=131&cad=rja&ved=0 CDEQFjAAOIIB&url=http%3A%2F%2Fwww1.ifc.org%2Fwps%2Fwcm%2Fconnect%2Ff58fde004756f 19c9f6fbf37b5ac3532%2FA2F_Product_Card_CB_SEP2010_FINAL.pdf%3FMOD%3DAJPERES&ei= DwEUYPhIoPBhAe8qIFo&usg=AFQjCNGjqLi4ogA0Gm80hM5q9FMLpCmcvA&sig2=PXTrEDTOKuW ghL5Un4FVxw&bvm=bv.41524429,d.d2k*

- Provide a more auditable process to help prevent subjective discrimination.[1]

2.5.1.13 INCREASED MOBILITY OF THE WORKFORCE:

The availability of comprehensive and timely credit report data contributes to the mobility of both labour and capital in the economy. As a result, credit reporting is arguably one of the key elements of the world infrastructure that underpins the remarkable productivity growth of the past few years.

Credit bureaus are good examples of institutions that facilitate the flow of both labour and capital to more valuable uses. Portable credit "reputations" give customers greater mobility. There is less risk associated with severing in gold relationships and starting new ones, because objective information is available that helps country residents to establish and build trust in new locations more quickly. From a labour market perspective, because the credit reporting system has increased the mobility of the population, structural shifts within the economy can cause temporary disruptions without crippling long-term effects .In contrast, more restrictive credit reporting laws in Europe prevent customers in the EU from taking full advantage of their complete credit histories. The fact that credit information is not mobile restricts the mobility of customers, especially across borders ,because of the resulting difficulty of obtaining credit from new institutions .As a result, customer lending in Europe tends to be concentrated among a few major banks in each country, each of which has its own large customer databases.

Borrower credit scores and account performance data are use by analysts to rate the quality of the securitized receivables, which facilitates appropriate pricing of the asset-backed securities. The transparency of risk in individual loans enables creditors to document and pool loans of similar risk and sell them to investors. As result, the securitization process brings huge amounts of loan able funds into customer and mortgage credit markets, making credit cheaper and more readily available. Indeed, the liquidity crisis can in part be tie to the fact that after securitization, the link to borrower credit information was lost, creating a vacuum of updated credit information on the

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[1]*Mark Rothemund, 2009, credit reporting: the future, Law Reform Commission, annual conference, centres for Europe policy studies (CEPS), Prussel.*

secondary market—the industry is currently working to address this gap, in hopes that increased transparency will improve investor confidence and liquidity.[1]

2.5.1.14 REDUCING INFORMATION ASYMMETRY:

Credit registries are a typical response to information asymmetry problems between lenders and borrowers. A credit registry is either a publically or privately owned entity that consolidates information on borrowers from lenders. On most cases comprehensive information helps lenders had better predict borrower default. Perhaps this is because historical information collected by a credit bureau had powerful default predictive power. For this reason, lenders could significantly reduce their default rate by including more comprehensive borrower information in their default prediction models.[2]

A study predicts that information-sharing institutions alleviate problems of asymmetric information in the following ways:

- Countering adverse selection. By reducing information asymmetry between lenders and borrowers, credit registries allow loans to be extended to safe borrowers who had previously been priced out of the market, resulting in higher aggregate lending.[3]
- Credit-sharing institutions can increase borrowers' cost of defaulting, thus increasing debt repayment.
- Conversely, sharing of credit-related information has the additional benefit of reducing the information monopoly a lender has on its borrowers. For example, banks with long-standing relationships with their borrowers know the credit history of those borrowers, while other lending institutions do not have access to this information. This allows the bank to charge higher interest rates and extract other rents from those high quality borrowers.[4]

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[1] *Report of the Expert Group on Credit Histories, 2009, DG Internal Market and Services.*
[2] *Jarl G.Kallberg and Gregory F.Udell, 2003, the value of private sector business credit information sharing: the U.S. case,, JOURNAL of MONETARY ECONOMICES, New York 27 (2003) 449-469.*
[3] *TullioJappelli and Marco Pagano, 1994, saving, growth, and liquidity constraints, quarterly journal of economic, volume 109, issue 1 (1994), 83-109*
[4] *above no 7*

- Information sharing between lenders reveals borrowers' debt exposure to all participating lenders, eventually reducing aggregate indebtedness as highly indebted individuals receive less credit (Bennardo, Pagano, and Piccolo 2009).[1]

2.5.2 THE ROLE OF CREDIT REPORTING SYSTEMS:

There is often confusion surrounding the role of credit reporting agency in the lending process. It is worth clarifying one key fact: credit-reporting agencies do not make lending decisions; only lenders can do that. Neither companies that develop credit scores, nor credit reporting agencies that developer information to scoring models to scoring participates in actual lending decisions. We simply are not in a position to testify as to how scores are weighted or what other information besides a score is considered when a lending decision is made.

Credit reporting agencies do provide credit reports and generate a credit score at the request of the lender from a model chosen by a lender. These credit scores help lenders make lending decisions. However, a credit score is simply one of the varieties of analytical tools lenders can use to take decisions. Each lender has its own proprietary underwriting process and uses information from multiple internal and external sources when making a lending decision. The volume of information sought would depend on many factors, from the type of loan being offer (i.e. year and model for an auto loan vs. similar sales records for real property).

A credit score a loan in any of these situations would not and should not be the sole determining factor for the extrusion of the loan, but would be balance against any information included in the customer's application or obtained by the lender.[2]

It is certainly true that, customer's credit report shows your entire financial standing on paper. Creditors, employers, insurance companies, and child support agencies can obtain his file. Income notwithstanding, customer judged almost solely based on the

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[1] *Antonio Doblas and Raoul Minetti, sharing information in the credit markets: contract-level evidence from U.S. firms, Michigan state university, working paper*
[2] *United States of America, subcommittee on financial institutions and customer credit, 2010, U.S. House of representatives (page 141).*

information contained in his credit report. It therefore makes sense to ensure that the file contains accurate information, and portrays you in as positive a light as possible.[1]

The more significant role of credit reporting could be:

❖ Credit reporting system comprises the institutions, individuals, rules, procedures, standards and technology that enable information flaws relevant to making decisions related to credit and loan agreements. At their core, credit-reporting systems consist of databases of information on debtors, together with the institutional, technological, and legal framework supporting the efficient functioning of such databases. The information stored in these systems can relate to individuals and/or businesses.

❖ A fundamental challenge affecting the relationship between creditors and debtors is that of asymmetric information. Debtors are more informed about their financial situation or standing than the creditor who is evaluating whether to extend credit to the debtors. Creditors, therefore, are often limited in their ability to access the credit risk associated with lending money or providing goods and services on credit.

❖ Credit reporting systems reduce information asymmetries by making a debtor's credit history available to potential creditors, and are therefore, an effective tool in mitigating issues of adverse selection and moral hazard. Through credit reporting information and tools derived from it (for example, credit scores), creditors can better predict future repayment prospects based on a debtor's past and current payment behaviour and level of indebtedness, among other factors.

❖ Historically, credit would be grant based on a credit offer's personal knowledge of the debtor.

❖ Credit reporting systems also serve to discipline debtor behaviour. A good credit history facilitates access to credit and can often obviate the need for debtors to put up tangible collateral for loans. Debtors who understand this are motivated to make payments on time to continue to have access to credit products under favourable conditions.[2]

❖ Financial supervisory authorities use credit-reporting data for macro and micro prudential supervision, monitoring of systemic risk levels, and producing macro statistics of financial system performance. The analysis of credit risk management,

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[1] http://www.finweb.com/banking-credit/the-importance-of-your-credit-report.html

[2] *Removing Obstacles to Growth, World Bank, doing business, 2004, Washington D.C, Oxford university press.*

provisions and capital adequacy, for example, benefits from the availability of credit information held by credit reporting service providers.[1]

❖ Using more complete fully reported credit tapelines enables lenders to reduce the quantity of misidentified borrowers sharply. Absent sufficient credit history, information, lenders may identify a prospective borrower as being a good credit risk when in fact they are a high-risk borrower (a type 1 error). Potentially even worse, some lenders may deny a prospective borrower credit because using available information, they are judge too high of a risk although in actually they are low risk and responsible borrowers (a type 2 error). Denying a credit worthy applicant access to credit based on incomplete or inaccurate lumped together with high risk borrowers, again due to insufficient information to distinguish the tow, resulting unfairly high interest rates for the low risk borrowers as they are forced cross-subsidize the costs of the greater rates of defaults of high risk borrowers. [2]

2.5.3 THE ADVANTAGE OF SHARING ACCURATE AND COMPREHENSIVE CREDIT INFORMATION:

There are a threefold effects of lender's exchanging information on the credit history of borrowers. First, credit bureaus improve bank's knowledge about applicant's characteristics and permit accurate prediction of repayment probability. This allows lenders to target and price their loans better, easing adverse selection problems. In this respect, the benefit of establishing a credit bureau is greatest where a large number of customers on which it has no previous information confront each bank.

Second, credit bureaus reduce the information rents that banks could otherwise extract from their customers. They tend to level the informational playing field within the credit market and force lenders to price loans more competitively. Lower interest rates increase borrower's net return and augment their intensive to perform.[3]

Information sharing has been the most prominent institutional solution to the problems that result from asymmetric information. Credit bureaus or registries are the mechanism

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[1]*General principles for credit reporting, 2011, consultative report, World Bank.*
[2]*Michael turner, Robin Varghese and Patrik Walker, 2007, on the impact of credit payment reporting on the financial sector and overall economic performance in Japan, INFORMATION POLICY INSTITUTION.*
[3]*Robert M.Hurt, 2002, the development and regulation of customer credit reporting in America, working paper no.02-21, Federal Reserve Bank of Philadelphia, study department.*

through which information on borrowers shared by lenders through which information on borrowers shared by lenders in an economy. Credit bureaus present history, amount of current debt, and other information, which used more accurately assess creditworthiness, capacity, and risk. Furthermore, by affecting a borrower's future ability to access loans, credit registries create an incentive to pay on time and thereby help reduce moral hazard problems.[1]

Every lender gathers information on the creditworthiness of potential borrowers. A debtor's history with a bank is also an important way to build a good track record. Credit registries make borrower's reputations accessible to other creditors. By facilitating information exchanges among lenders, registries help creditors sort good borrowers from bad, price loans correctly, and reduce the costs of screening. When borrowers know that their reputation will be share among lenders, they have additional incentives to repay. In addition, because credit histories are available, borrowers benefit from lower interest rates, as banks compete for good clients.[2]

2.6 GENERAL PRINCIPLES OF CREDIT REPORTING:

The key considerations concerning credit-reporting systems can broadly grouped around the following topics:

1- Data.
2- Data processing.
3- Governance arrangements and risk management.
4- Legal and regulatory environment.
5- Cross-border data flows.

The general principles organized around these five topics. These five general principles aim at the following public policy objectives for credit reporting systems should effectively support the sound and fair extension of credit on economy as the foundation for robust and competitive credit markets. To this end, credit reporting systems should be safe and efficient, and fully supportive of data subject and customer rights:

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[1] *http://www.robertscreditgroup.com/public/135.cfm*
[2] *Understanding regulation, World Bank, doing business, 2004, Washington D.C, Oxford university press.*

2.6.1 DATA:

Credit reporting systems should have relevant, accurate, timely, and sufficient data; including positive collected on a systematic basis from all reliable, appropriate, and available sources, and should retain this information for a sufficient amount of time.

Credit information results from processing two broad categories of data: identity data and credit data. Identity data collected to enable the correct identification of the borrower; credit data collected to describe the borrower's indebtedness. In the case of individuals, the information usually shared throughout the system includes, among other, the name and address of the data subject, among of loan, type of loan maturity of loan, guarantees and collateral, value, default information and payments in arrears. Credit reporting service providers usually supply this information to creditors in a standardized manner, and some service providers include system-wide or consolidated information such as credit inquiries from other creditors and credit scores.

Other types of data are valuable for credit reporting but that are not provided by traditional data providers include identity data that can be matched and cross-checked to validate a data subject's identity, companies' registry data judicial court rulings that provide additional information regarding unpaid debts, utility records and telephone files. This information could be useful to detect and prevent fraudulent credit applications. Frequently, the owners of these data sources are public agencies that are not users of the credit-reporting system. Moreover, in some countries' certain data, elements deemed "sensitive" and prohibited by law from being provide to others, such as demographic data.

Some of the typical data elements supplied by credit registries include name and address of borrowers, type of loan, the outstanding amount of loan, late payments, default/cancelled debts, and on-time payments. Credit registries also develop debtor/borrower classifications, which based on elements such as past-due loan payments.

Credit reporting service providers and value to the data they receive by consolidating the various information pieces and introducing a series of payments, identifiers, measures or other tools to assist users in identifying the risk features of data subjects.

Additionally, service providers may offer predictive scoring models for risk or fraud, and historical performance information.

Information quality is the basic building block of an effective credit-reporting environment. Accuracy of data implies that such data is free of error, truthful, complete, and up to date. In accurate data may lead to unjustified loan to data accuracies are the subject of numerous complaints and litigation around the world and, as a result, have a significant impact on the development of credit reporting systems.

In accurate data may result from human error or other causes, for example, incorrect data provided by the data subject or human error from creditors or other sourced when inputting data will result in incorrect data being transmitted to the credit reporting system, subsequently affecting the quality of reports. In addition, data pertaining to a certain data subject due to inadequate identification mechanisms (e.g. improper matching of names, lack of identification keys for individuals and/or businesses, the inability of such keys to provide a unique identifier or the impossibility to use such keys given legal and regulatory restrictions.). Identity matching problems are likely to be exacerbating in the context of cross-border data transfers.

Errors can also originate at the level of credit reporting service providers. A potential source of errors in this case is associated with one of the core functions of credit reporting service providers, which consists of consolidating and matching the data that received from a variety of credit-reporting data providers and other data sources. If no proper definitions, tools and controls are in place, execution of such processes may result in duplicate or missing records, which would, then lead to incorrect inferences about the data subject due to, for example, underestimation or overestimation of the data subject's outstanding liabilities.

Another possible source of inconsistency in data relates to different definitions being used by the various data providers and other data sources with regard to what constitutes a delinquency or other credit events. For example, most creditors will report a delinquency when a loan is 30-days past due. However, some will do so only after 60 days or more. Still others might report delinquency immediately after the deadline for a scheduled loan payment not met.

In addition, to be free of error, data needs to be update and made available in a timely manner. This implies first that data providers and other data sources need to update their respective databases quite frequently (i.e. a given number of days after the occurrence of a given relevant events), second, update data needs to be provided to a credit-reporting service provider on a frequent basis. This will usually take the form of a pre-defined scheduled, although many credit reporting service providers have also defined a set of variables that, in the event of a change, are to be report within the pre-defined interval (i.e. so-called "trigger events"). Thirdly, updated data needs to be making available to users as soon as practical.

Data providers may fail to meet the updating schedule of credit reporting service providers. This may be due to several factors, including lack of human or financial sources or inefficient technology that incapable of meeting reporting requirements. It could also be the case that the data provider willingly fails to observe the reporting schedule. For example, data providers may lack the necessary motivation to provide data in a timely manner if they believe that the data they receive from the credit-reporting data provider is not useful enough. A data provider may also conclude that other data providers are not providing timely information, for instance, to keep to themselves information, they deem strategic, in which case it may decide to do the same. Situation like these tends to be more frequent in the absence of a clear set of rules and/or incentives that foster compliance with the updating schedule.

The final step of ensuring timeliness of data is that the updated information actually flows to users from credit reporting service providers without any significant lag. As discussed earlier, credit reporting service providers convert raw data into information that is more readily usable by users. Therefore, it is important that the period to execute this process be as short as possible. Service providers can also help ensure timely delivery modes that enhance the ability of users to access and use data.

Another characteristic of accurate data is its sufficiency and adequacy. Three features are critical for sufficiency:

- ❖ Being able to capture relevant detailed information, including negative as well as positive data on a given data subject.
- ❖ Gathering information from as many data providers and other data sources as possible, within the limits established by law.

❖ Having sufficient information in terms of the period over which observations are available.

So-called "negative credit reports" or "negative data" are normally limited to reporting unfulfilled financial obligations, such as late payments, defaults, bankruptcies, and court judgements. However, such adverse events are rare or do not occur at all. Therefore, in an environment where only negative credit reports provided, debtors who meet their financial obligations regularly and without any adverse events will only have a partial credit history in the eyes of third parties, since no data on them shared or reported.

Positive credit reporting, also known as positive data, integrates the data captured by negative-only files with other types of data, which may include, but not limited to, account balances, number of inquiries, debt ratios, on-time payments, credit limits, account type, loan type, lending institution, and public record data, detailed reports on the prospective borrower's assets and liabilities, guarantees, debt maturity structure, and pattern of repayments, among others. Positive data is therefore, more comprehensive and its use is empirically associated with lower incidences of extensions of credit to bad debtors, and at the same time successful extension of credit to debtors with little previous credit experience.[1]

In countries where positive credit reporting prohibited by the legal and regulatory framework or simply not performed for other reasons, a debtor's ability to access new financing following an adverse event may be severely impaired. This is because the negative data stemming from the adverse event is usually stored for a number of years, normally ranging from three to seven. On the other hand, in a positive credit reporting environment a debtor's economic recovery and improved repayment behaviour after the adverse events are captured, and the debtor's credit score would be progressively adjusted.

In addition to credit reporting being of a "positive" or "negative" type, it also be classified as comprehensive in the sense that information silos avoided. Non-comprehensive (which is also known as "segmented") credit reporting is based on the limited number of sources. Comprehensive credit reporting, on the other hand, based on the collection of information from a wide variety of sources and sectors, including

[1] *John M.Barron and Michael Staten, 2004, the value of comprehensive credit reports: lessons from the U.S. experience, Purdue university*

retail, small business, micro finance, credit cards, insurance, telecom, utilities, and others. As a result, comprehensive credit reporting increases the ability of creditors to access and monitor credit risk, creditworthiness, and credit capacity.

Ensuring a wide range of data providers and other data source is not always possible; however, the scope of data and/or the scope of data providers and other data sources may be limited by legal or regulatory restrictions. For example, regulators of non-traditional data providers like telecom may find it unacceptable for their customers outside the sector. Moreover, access or prohibitively expensive, for instance, due to the low levels of automation of public records in some countries.

At the same time, it should be recognized that not all information that can be potentially collected on a given data subject will be relevant for the purposes associated with credit reporting. Indeed, some data are irrelevant in that they add little or no value in determining the probability of repayment. For example, it is not evident that demographic details such as race and ethnic origin add any value to credit underwriting decisions. Moreover, some data pieces may not only be irrelevant but also harmful to collect or distribute.

Irrelevant of data can also occur when certain pieces of data, typically negative data, are retained for a longer than the needed period have time and become obsolete, thus losing their predictive capacity.

2.6.2 DATA PROCESSING: SECURITY AND EFFICIENCY:

Credit reporting system should have rigorous standards of security and reliability, and be efficient.

ROLES OF KEY PLAYERS:

ROLE (A):

Data providers should report accurate, timely, and complete data to credit reporting service providers.

ROLE (B):

Credit reporting data resides in databases and other types of data-holding methods that are subject to security and safety concerns, including loss, destruction

corruption, theft, and misuse. These concerns become greater as the interconnectivity of databases and data network's increases. If such threats were to materialize, they could have serious or even irreversible consequences on credit reporting system activities such as widespread distrust regarding data sharing.

The major issue related to security and conditionality lies in identifying sources of risk, addressing those risks, and assigning appropriate responsibilities for correcting situations in which such risks actually materialize. The more complex a system is, the more difficult it becomes to identify the potential liabilities and pro-actively assign appropriate responsibilities.

Services rendered by the credit-reporting service providers are becoming increasingly critical. In countries where credit-granting decision-making is highly automated, a disruption in credit reporting services may cause upheavals in customer credit markets. The reliability of credit reporting services (i.e. being able to access the service when needed) is there for a crucial element of an effective credit reporting system.

Ensuring the provision of continuous service within the accepted service level standards will most likely require credit reporting service providers to make significant capital investments and undertake a series of other measures related to the organization of work and responsibilities under different emergency scenarios. All these can present major challenges.

Significant capital investments are also required to meet a growing demand for high-quality products and services that meet the needs of a rapidly evolving credit culture. Credit reporting service providers therefore faced with the additional challenge of meeting these demands while at the same time trying to maintain the affordability of the services for the various categories of users.

It should be noted that the likelihood of service providers making the necessary investments depend to a large extent on the size and the sophistication of the market they serve. From another perspective, in markets lacking sufficient critical mass, investments of this magnitude might not be viable.

Other data sources, in particular, public records agencies, should facilitate access to their databases to credit reporting service providers.

ROLE (C):

Credit reporting service providers should ensure that data processing is secure and provide high quality and efficient services. All users having either a lending function or a supervisory role should be able to access these services under equitable conditions.

ROLE (D):

Users should make proper use of the information available from credit reporting service providers.

ROLE (E):

Data subjects should provide truthful and accurate information to data providers and others and data sources.

ROLE (F):

Authorities should promote a credit-reporting system that is efficient and effective in satisfying the needs of the various participants, and supportive of data subject,customer rights and of the development of a fair and competitive credit market.

2.6.3 GOVERNANCE AGREEMENTS AND RISK MANAGEMENT:

The governance arrangements of credit reporting service providers and data providers should ensure accountability, transparency, and effectiveness in managing the risks associated with the business and fair access to the information by users.

Largely, the services provided by the credit-reporting industry deemed to be of public interest, and therefore might become the object of public policy. However, situations exist where the actual objectives that the credit-reporting service providers seek in practice diverge from the public policy goals underlying a service of this kind. A major determinant of such divergences can be trace back to the ownership structure of the credit-reporting service provider. While there are no "good or bad" ownership structures, certain structures may lead to more issues than others.

Ownership by a particular group of large lenders, typically banks, can lead to anti-competitive behaviour in the information sharing market. For example, majority of shareholders can restrict or prevent access to the service by smaller lenders. In another

scenario, a credit-reporting service provider may wish to expand access to all types of users in order to maximize profits. Large lenders may not be willing to share information in such a scenario as they may consider that they will be contributing quality data and disclosing their good customers, while it is unlikely that this will be compensate with the data, they will be able to obtain from the service provider. Situations like these may lead to the creation of service providers that service specific sectors of the credit market, thus leading to silos of information. As earlier discussed, such as fragmented information sharing markets undermine the benefits like these can be mitigate through proper governance arrangements.

Appropriate governance is also crucial for ensuring that data providers, other data sources and credit reporting service providers will be able to cope successfully with the risks underlying the information sharing ad credit reporting businesses. These entities mainly exposed to operational risks, legal risks, and reputational risks. Therefore, probably more than in most other businesses, the materialization of any of these risks can severely impair the long-term viability of the credit-reporting organization.

As with all technology incentive organizations dealing with multiple parties, the potential for operational errors and unauthorized access to the information, either from inside the credit reporting service providers or from outside, is significant. Legal risk stems from the inadequate or erroneous observance or interpretation of the applicable legal and regulatory framework. Reputational risk is particularly relevant due to nature of credit reporting; personal data being use in sensitive activities like lending and financial supervision. As it is practically impossible to avoid all risks while maintaining available business, credit reporting service providers and data, providers need to recognize these risks and hence need to manage them.

Given the relevance of credit reporting activities for credit and other financial markets, coupled with the sensitivity of the data that is handled in these activities, it appears desirable that credit reporting service providers and data providers be scrutinized in order to promote an appropriate level of accountability on the side of such providers. This would generally do through some form of independent check by a qualified third party such as an auditing firm or a government agency.

Peculiarities in governance arrangements of publicly owned credit reporting service providers should not preclude the achievement of the business and public policy objectives and appropriate risk management.

2.6.4 LEGAL AND REGULATORY ENVIRONMENT:

The overall legal and regulatory framework for credit reporting should be clear, predictable, non-discriminatory, proportionate, and supportive of data subject and customer rights. The legal and regulatory framework should include effective judicial or extrajudicial dispute resolution mechanisms.

Although credit-reporting systems have existed at least since the 1800s, specific regulation of credit reporting systems coincided with the technological development of 1960s and rising concerns over transparency and individual rights. The growing recognition of credit reporting activities as a core function in any modern financial market has also become a catalyst the regulation of these activities.

Over the last decade, a large number of countries have devoted efforts to regulate credit-reporting market, particularly when privet sector credit reporting service providers are present. Regulation of credit reporting activities usually focuses on registering or licensing of credit reporting service providers, imposing responsibility for data accuracy, collection, and disclosure, customer having access to their information and being able to have erroneous information corrected, compliance monitoring, and enforcement. There is, however, no consensus on what constitutes an adequate legal and regulatory framework for credit reporting, as there is a natural tension between the objective of having access to broader sources of information for enhanced credit reporting, and the interest in preserving individual privacy.

In some countries, laws or regulations enacted to deal with specific issues of concern, some of which might not be exclusive to credit reporting like privacy issues and data protection. In others, a special legal framework for credit reporting activities exists, usually in an attempt to typify. These activities and regulate them in an integral manner. It is also possible for the two models to co-exist. According to experience in several countries, legal risks are generally greater where there is an absence of laws and regulations covering credit reporting systems and the related activities. These risks include confidentiality breaches regarding, financial data, credit reporting service

provider employees liability for data processing, and risks related to automated decision making, to name just a few.

As with other economic activities, there is the risk that the legal framework be too restrictive, thus hindering the development of an efficient credit reporting system. For example, the legal framework, if not properly designed, can create unjustified barriers to entry to potential new market players. Furthermore, in a tempt to protect privacy rights; the legal framework might require data providers and service providers to obtain consent from data subjects each time they wish to collect data on them, which, a part from being costly would be overly cumbersome and undermine the usefulness of the data.

On the other hand, regulation can be address in an effective manner. One important example is that of ensuring competitor's fair access to credit reporting services, especially when ownership structure of credit reporting service providers does not provide incentives for the latter to do so. Regulation can also be necessary to ensure that certain standards (e.g. data quality) be equally applicable to all participants in the system.

Since credit reporting, systems based on the flow of data through an existing network of stakeholders; laws of data regulation should carefully consider issues related to property rights regarding data and data basis, assigning realistic responsibilities and rights over the data processed, and the format used for such a processing. A relevant matter is that of format ownership, especially if this might represent a barrier of entry for other service providers.

One of the biggest challenges of the legal framework is that its provisions be enforceable. On the one hand, laws and regulations should be practical and effective to ensure a high degree of compliance. In other words, rules that cannot be enforce are not likely to be effective, on the other hand; authorities should be capable of enforcing legal provisions administratively, which requires a combination of sufficient powers and adequate human and financial resources. In the case of credit reporting activities, one additional difficulty is credit-crosscutting issues might fall under the jurisdiction of several government agencies, which then leads to the need for effective cooperation between regulators.

The public agencies that are normally charged with the responsibility of regulating credit reporting activities include central banks and bank supervisors, and in some cases ministries of finance, data protection authorities, customer's protection authorities and competition and antitrust authorities. In a recent year, it recognised that the role of the authorities is not limited to applying the existing legal framework; authorities also play a leading role in developing a vision for the systems, in coordinating with all stakeholders and other authorities as well and in carrying out a reform plan, if necessary. In some cases, one of the authorities designated as the system overseer and charged with the responsibility of promoting the appropriate development of the credit-reporting system as a whole, making sure that the efforts of the various regulatory authorities are coordinated and are consistent.

Information sharing must regulated from two fronts. First, the sharing of information must protect the privacy of customers. Specific institutions will be authorizing within the legal framework to access customer information. If strict regulation of this standard is not enforced, customers will not trust credit bureau system and the credit bureau will fail. It is the onus of the bureau to prove to customers and institutions that they can provide appropriate information security. Legal frameworks should require borrowers consent for institutions to access their credit information.[1]

Second, the sharing of both positive and negative information must be regulate and restricted to very narrow purposes. Failure to specify the limits of this use cannot only violate privacy, but can also distort the market for lending. Every credit system has its own set of laws that define data subject rights, and the afforded rights differ depending on political situation and framework of any existing credit system. Some data subject rights to consider are:

RIGHT TO PERSONAL DATA:

Customers have the right to knowledge of all personal data maintained by an institution, as well as to whom the information in their file has been disclosed (UK,US, EU, Japan):

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[1]*The Fair Credit Reporting Act (15 U.S.C 1681)*

❖ RIGHTS TO THIRD PARTY NOTIFICATION:

Customers have the right to be notifying of all third parties who have received subject data information, including information about rectification, deletion, or blocking of data (EU), this right does not apply if it is a disproportionate effort for the data controller.

❖ RIGHTS TO DATA CONTROLLER:

Customers should have the right to have file examined by a data controller, such that any final decisions made about their file is not an entirely automated decision, but monitored by a data controller (UK).

❖ RIGHTS TO REQUEST A CREDIT SCORE:

- Customers have the right to know their individual credit score that is being use by potential lenders to access risk.

- A customer is entitled to free credit report if (US):

▪ Adverse action taken against the customer based on information in the customer's credit report.

▪ A customer is the victim of identity theft.

▪ A customer's file contains false information due to fraud.

▪ A customer is benefiting from public assistance.

▪ A customer is unemployed, but expects to gainfully been employed within 60 days.

❖ RIGHT TO OBJECT:

Customers have the right to object to the processing of their personal data (some exceptions exist) (EU).

❖ RIGHT TO OPT-OUT:

Customers have the right to limit or control the collection of personal information; data controllers must describe the intended use and handling of personal information (Japan).

❖ RIGHT TO PROTECT PROCESSING:

Customers have the right to have their data protected from any adverse processes and be protected from use for direct marketing (UK.EU), or customers may limit the number of pre-screened offers of credit or insurance and all pre-screened applications must be accompanied with toll free numbers by which the customer may cancel their participation (US).

❖ RIGHT OF GRIEVANCE:

Customers have the right to examine the information in their file, and have the right to a system that helps them to correct inaccurate data (UK.US.EU.JAPAN).

❖ RIGHT TO CORRECTION OF INACCURATE DATA:

❖ A credit bureau is responsible for correcting information in a customer credit file that has proven false (UK.US.EU).

❖ RIGHT TO OVERSIGHT:

Customers have the right to request oversight of the data subject to ensure that the legislation appropriately implemented and followed (US).

❖ RIGHT TO ERASURE:

A customer has the right to have personal data erased in cases of unlawful processing of data (US).[1] The legislative framework should provide for four basic phases of grievance resolution:[2]

❖ PERSONAL INFORMATION:

- A customer requests documentation of the data held on them by institutions (right to personal data).
- Credit bureaus must be structure such that they can immediately release information to customer.
- All information in the customer file must be release, including the stored information, and those that have been provide with the customer's information.

❖ RECEIPT OF GRIEVANCE:

- A customer contests the information in their file (right of grievance).
- Credit bureaus should have a streamlined system to receive complaints: customers must have easy access to customer service.
- Each customer complaint should assign a case, and framework for the resolution of each case should be in place.

❖ AUTHENTICATION OF GRIEVANCE:

The credit bureau must have a system to verify the authenticity of the dispute.

❖ GRIEVANCE RESOLUTION:

- Credit bureaus must respond to each customer case.

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[1] above No 28
[2] above No 27

- Credit bureaus must contact customers individually to notify them of the result of their cases.
- Credit bureaus may provide for system of appeals in the case the customer refute the resolution.

2.6.5 LEGAL FRAMEWORK FOR CREDIT REPORTING:

Legal framework for credit reporting varies greatly around the world. Usually there are several laws in a country, which would be relevant to operations of credit reporting registry. These laws include:[1]

- Regulations concerning bank secrecy.
- Data protection law.
- Customer protection.
- Fair credit granting and customer credit regulations.
- Provisions regarding privacy and personal or corporate secret in existing laws.

2.6.5.1 CUSTOMER'S RIGHTS UNDER THE FAIR CREDIT REPORTING ACT:

The federal credit-reporting act ((FCRA)) designed to promote accuracy, fairness, and privacy of information in the files of every "customer reporting agency" ((CRA)). Most CRAs are credit bureau that gathers and sells information about customers such as if he pays his bills on time or has failed bankruptcy- to creditors, landlords, and other businesses. The FCRA gives customers specific rights, as outlined law. They may contact a state or attorney general to learn those rights:

❖ Customer should inform if information in his file has used against him. Anyone who uses information from a CRA to take action against another-such as denying an application for credit, insurance, or employment-must tell him, and give him the name, address, and phone number of the CRA that provided the customer report.

❖ Customer can find out what is in his file. At his request, a CRA must give him the information in his file, and a list of everyone has requested it recently. There is no

[1] http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=132&cad=rja&ved=0CDgQFjABOIIB&url=http%3A%2F%2Fwww.ifc.org%2Fifcext%2Fmekongpsdf.nsf%2FAttachmentsByTitle%2FRegulatory-framework%2F%24FILE%2FRegulatory-Framework.pdf&ei=D-wEUYPhIoPBhAe8qIFo&usg=AFQjCNEa4YEP_rhyFXcrKL_s0PUVJz23Bw&sig2=OEqQrgaEG8w9AdtDQBpTsw&bvm=bv.41524429,d.d2k

charge for the report if a person has taken action against another because of information supplied by the CRA if the customer request is the report within 60 days of receiving notice of the action. Customers also are entitled to one free report every twelve months upon request if he certified that (1) he is unemployed and plan to seek employment within 60 days, (2) he is welfare, or (3) his report is inaccurate due to fraud. Otherwise, a CRA may charge him up to eight dollars.

❖ Customer can dispute inaccurate information with the CRA. If he tells a CRA that his file contains inaccurate information, the CRA must investigate the item (usually within 30 days) by presenting to its information source all relevant evidence he submits, unless his dispute is frivolous. The sours must review his evidence and report its findings to the CRA. The sours also must advise national CRAs-to which it has provided the data-of any error.

The CRA must give the customer a written report of the investigation and a copy of his report of the investigation results in any change. If an item deleted or a dispute statement failed, customer may ask that anyone who has recently received his report notified of the change.

❖ Inaccurate information must be correct or deleted. A CRA must remove or correct inaccurate or unverified information in its files, usually within 30 days after a customer disputes it. However, the CRA is not required to remove data from customer's file unless it is out-dated or cannot verify. If a customer's dispute results in any change to his report, the CRA cannot reinsert into his file a disputed item unless the information source verifies its accuracy and completeness, the CRA must give a customer written notice telling him it has reinserted the item. The notice must include the name, address, and phone number of the information source.

❖ Customer can dispute an inaccurate item in the source of the information. If the customer tells anyone-such as a creditor who reports to a CRA-that, he disputes an item, they may not, then report the information to a CRA without including a notice of his dispute. In addition, once customer has notified the source of the error in writing, it may not continue to report the information if it is, in fact, an error.

❖ Out dated information may not b reported. In most cases, a CRA may not report negative information that is more than seven years old; ten years for bankruptcy.

❖ Access to customer's files is limited. A CRA may provide information about customer only to people with a need recognized by the FRCA, usually to consider an application of a creditor, insurer, employer, landlord, or other business.

❖ Customer's consent is required for reports that provided to employers, or reports that contain medical information. A CRA may not give out information about a customer to his employer, or prospective employer, without his written consent. A CRA may not report medical information about the customer to creditors, insurers, or employers without his permission.

❖ Customer may choose to exclude his name from CRA lists for unsolicited credit and insurance offers. Creditors and insurers may use file information as the basis for sending unsolicited offers of credit or insurance to customer. Such offers must include a toll-free phone number for him to call if he wants' his name and address removed from future lists.[1]

❖ Any person who uses information from a customer report obtained from a customer reporting agency to take adverse action against a customer – such as denying an application for credit, insurance, or employment- must tell the customer the name, address, and the phone number of the reporting agency that provided the customer report, inform the customer of the right to obtain a free copy of his or her customer report within sixty days of receiving the notice, and notify the customer of the right to dispute with the reporting agency the completeness or accuracy of the customer report.

❖ Upon a customer's request, a customer-reporting agency must provide the customer with all information in his or her file at the time of the request, except for credit scores, and identify each person who has requested it recently. There is no charge for the report if an adverse action has taken against the customer because of information in a customer report supplied by the reporting agency and the customer requests the report within sixty days of receiving notice of adverse action from the person taking the adverse action.

❖ If a customer notifies a reporting agency that his or her file contains inaccurate or incomplete information, the agency must investigate the items (generally within thirty days) by presenting to the furnisher or source of the information all relevant evidence submitted by the customer, unless the agency determines that the dispute is frivolous. The furnisher or source must review the evidence, investigate the disputed information ,and report its findings to the reporting agency .The agency must provide the customer with a written notice of the results of the investigation ,a copy of the customer report as

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[1]United States of America, subcommittee on financial institutions and customer credit, "keeping score on credit scores: an overview of credit scores, credit reports and their impact on customers", WASHINGTON, D.C. 2010 (page 153).

revised based on the results of the investigation ,notice of the procedures used in the investigation (including the furnishers contacted),notice of the customer's right to add a statement to the file disputing the accuracy or completeness of the information ,and notice of the customer's right to request that the reporting agency notify certain recent recipients of customer reports of the deletion of the disputed information.

❖ A customer-reporting agency must remove or correct inaccurate, incomplete, or unverified information from its files, generally within thirty days after a dispute is filed .However, the reporting agency is not required to remove accurate data from a customer's file unless it is out dated information that required to be exclude from customer reports.

❖ If a customer tells a furnisher of information, such as a creditor who reports to a customer-reporting agency, that specific information is inaccurate or incomplete, the furnisher may not then report the information to a reporting agency without including a notice of the dispute.

❖ In most cases ,a customer reporting agency may not report negative information that is more than seven years old .However, there are certain exceptions:

- Information about criminal convictions may report without any time limitation.
- Bankruptcy information may report for ten years.
- Information reported in response to an application for a job with an annual salary of more than$75,000 has no time limit.
- Information reported because of an application for more than $150,000 worth of credit or life insurance has no time limit.
- Information about a lawsuit and unpaid judgment against a customer, or record of arrest can be report for seven years or until the statute of limitations runs out, whichever is longer.

❖ A customer-reporting agency may furnish a customer report only to a person with a permissible purpose recognized by the FCRA usually to consider an application for credit, insurance, employment, housing rental, depository account, or other legitimate business need, or in accordance with the written instructions of the customer.

❖ A customer-reporting agency may not furnish a customer report generally to a customer's employer or prospective employer, or a customer report containing medical information about the customer in connection with a credit or insurance transaction, without the customer's written consent.

❖ Creditors and insurers may use reporting agency file information as the basis for sending un solicited firm offers of credit or insurance .Such offers must include free phone number or address established by the agency from whom the creditor or insurer obtained the information and whom the customer may call or write to have his or her name and address removed from future lists.[1]

2.6.6 CROSS-BORDER DATA FLOWS:

Financial liberalization has significantly reduced restrictions on the operations of financial institutions in foreign markets. At the same time, businesses initiating activities in a new country and individuals who have changed their country of residence will most likely need to establish a relationship with a local financial entity. New challenges have thus emerged in recent years, including the need to monitor credit exposures of important borrowers outside a financial institution's home markets, or providing credit and other financial services on a sound basis to businesses and individuals who do not have a credit history in the country where they are applying for credit.[2]

2.7 DISPUTE THE ERRORS:

Credit report comes with a form for disputing errors by mail, or online, depending on the way customer ordered his report.

Credit bureaus are required by law to investigate any mistakes that customer brings to their attention and report back to him within 30 days. Typically, they ask the creditor who reported the information to check its records. If the creditor cannot vouch for the accuracy of what it reported or does not respond, the offending item deleted from customer's report.

That does not mean the error stays off. Unfortunately, some creditors persist in reporting inaccurate information. A customer might follow the rules to get problem removed, and the creditors simply report it again a few months later.[3]

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[1]*Robert B. Avery, PoulS.Calem, and Glenn B. Canner, 2010, An overview of customer data and credit reporting, the board's division of study and statistics & the university of southern California.*
[2] *http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTFINANCIALSECTOR/0,,contentMDK:229 12648~pagePK:148956~piPK:216618~theSitePK:282885,00.html*
[3]*LizPulliam Weston, 2009, (Your Credit Score, Your money and what is at Stake), United States of America, FT press.*

2.7.1 RULES ON DISPUTE/VERIFICATION:

Rules for dispute and verification of customer data file are based on the data subject right to personal data, whereby a customer has the right to know the personal information that an institution maintains, as well as the right to know with whom that information has been shared. As previously discussed, data subject rights must also include the right of grievance: a customer may contest the information in their credit file and provided with an appropriate venue for correction. Additionally, the legislative framework must provide for authentication of information. Credit bureaus must be prepared to receive grievances and verify the accuracy of complaints.[1]

2.7.2 DISPUTE MISTAKES:

Your credit report will include information about how to dispute a mistake. If your dispute is about a credit account, you should send a dispute letter to both the credit reporting company and creditor that was the source of the information. Your dispute should clearly explain what you think is wrong and why. State the facts, explain why you are disputing the information, and request that it corrected. In your dispute letter to the creditor, you may want to enclose a copy of the relevant portion of your credit report. Highlight the items in question. Also, include copies of documents that support your position. Never send your original documents. Keep copies of your dispute letters and enclosures. The credit reporting company and the creditor should investigate the dispute or fix any mistake. If the disputed information is wrong or cannot be verifying, the creditor must delete or change it and provide a correction to the credit reporting companies that received the disputed information. If an investigation does not resolve your dispute filed with a customer report company, you can ask that a statement of the dispute be included in your credit file and in future credit reports.[2]

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[1] *Above no.28*
[2] *Customer financial protection bureau, Washington DC 20552.*

Figure 2.1: Summary of procedures disputing accuracy of a credit report[1]

Debtor requests and receives copy of credit report

Debtor is satisfied with report contents – process complete	Debtor is not satisfied and disputes in writing by phone, or in person complete

Credit reporting agency provides notice of dispute to federal agencies within 5 business days along with "all relevant information" that the debtor provided

Federal agency considers" all relevant information" submitted by the debtor

Federal agency determines its information to be accurate	Federal agency determines its information to be inaccurate or incomplete or cannot verified

Federal agency notifies credit-reporting agency

Information maintained on file by credit reporting agency

Federal agency notifies all credit reporting agencies to which it reports

Credit reporting agencies must "promptly" delete (or update information) as appropriate based on federal agency reinvestigation

MUST TAKE NO LONGER THAN 30 DAYS

Within five days of completion of reinvestigation, credit-reporting agency notifies the debtor in writing of the results. Notice must include:

- Statement that reinvestigation is completed and revised credit report.
- Notice that the debtor can add a 100-word statement to report.
- If requested procedures used to reinvestigate, and names, addresses, and phone numbers for federal agencies

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[1]*Guide to the federal credit bureau program, 2005, FINANCIAL MANAGEMENT SERVICE, department of the treasury, http://www.customerfinance.gov*

2.8 CHAPTER SUMMARY:

Once an obscure and widely misunderstood document, the customer credit file has become one of the most important decision-making tools used by deferent kind of lenders. It is use in serving other "permissible purposes" for an expanding range of businesses is growing rapidly. As customers come to understand the reach and influence of credit reports, they will have an interest in verifying and monitoring the data been reported by the credit reporting agencies. Anticipating increased demand for credit by customers, credit-reporting companies are already working to enhance their raw credit reporting data with customer-oriented information that makes reading the reports easier.

Arguably, the passage of the Credit Reporting systems and the introduction of computer technology were two events that left an indelible mark on the industry. Overall, the reliability and quality of information, and indeed the integrity of borrowers' "reputations," have been greatly enhance since the early days of incomplete and often anecdotal information manually reported by unregulated local bureaus.

CHAPTER III

CREDIT SCORES AND BUREAUX

3.1 INTRODUCTION:

The phenomenon of credit scoring was first used in the 1960s, to determine whether people applying for credit would repay the debt, honour the obligation, and in general act in a manner deemed acceptable by the treasury's gatekeeper. At that time, it was associated exclusively with "accept/reject" decisions generated by the new-business application process (application scoring), and many people still use the term in that limited sense. In the twenty-first century, however, the label is used more broadly to describe any use of statistical models to extend and manage credit generally. This includes the measurement of risk, response, revenue, and retention (the 4Rs), whether for marketing, new business processing, account management, collections and recoveries, or elsewhere (the credit risk management cycle CRMC).

Credit scoring systems could found in virtually all types of credit analysis, from customer credit to commercial loans. The idea is to identify certain key factors that determine the probability of default (as opposed to repayment), and combine or weight them into a quantitative score. In some cases, the score could literally interpret as a probability of default; in others, the score can be used as a classification system. That is, it places a potential borrower into either a good or a bad group, based on a score and a cut-off point.[1]

This chapter, include the definition and philosophy of credit scoring technology, clarifying the objectives, benefits, and the role of credit scoring technique in the customer lending process, discussing the consideration and design of data may use in credit scoring.

As mentioned in Chapter 2, lenders have three main data sources: the customer, internal systems, and external agents. This chapter eventually covers the history of the primary class of external agents the credit bureaux, which are retail lenders conduit for credit intelligence from the outside world. While even the earliest lenders used spies to gather intelligence about borrower's activities, modern credit reporting was born of the industrial revolution, and over the past two centuries, has become a mainstream industry in its own right. Today, four companies dominate the industry; Dun & Bradstreet

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[1]*Gunter Loffler, Peter N. Posch, 2007, credit risk modelling using Excel and VBA, John Wiley and Sons Inc, USA, p 12*

(D&B) is the major player in business credit reporting, while Equifax, Experian, and Trans-Union dominate the customer market.

3.2 THE DEFINITION AND PHILOSOPHY OF CREDIT SCORING TECHNOLOGY:

3.2.1 CREDIT SCORING DEFINITION:

Credit scoring is a technique used by financial intermediaries for screening applicants. This procedure first adopted during the fifties, mainly by finance houses and mail order firms. At that time, decisions were made judgementally by credit analyst: creditworthiness evaluations largely depended on the rules of financial houses and on the experience and knowledge of their clerks is assessed by means of a scoring models, and those models are based on the characteristics of the loan applicant and it estimates the credit risk by predicting the repayment behaviour of the applicant.[1] In the sixties, when the number of applicants for credit cards increased, an automated system was necessary. The first consultant firm founded in 1957 in San Francisco, since then, the automated credit scoring procedure spread quickly and became a standard for risk evaluation for customer lending, for mortgage lending and for business lending.[2]

Sometimes credit scoring called risk scoring is a rating by a bureau to determine customer's creditworthiness and the likelihood and timeliness of loan repayment. A credit score may have impact whether or not a customer receive credit as well as other credit terms such as percent interest rates. Lenders consider several factors including a credit score, when extending credit. [3] Hence, it is a term used to describe the formal statistical methods that used to classify applicants into "good" and "bad" classes.[4]

Firms sometimes use credit scoring to assign a numerical rating for a customer based on the information they collected about the customer. The firm then bases its decision to grant or commercial firms are typically return on scale. The overall credit score for a firm based on the individual factor scores and the weights applied to each factor. One method used to assign the factor weights is a statistical technique called Multiple

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[1] *Jie-Men Mok, 2009, Reject Inference in Credit Scoring, BMI paper*
[2] *Giuseppe Bertola, Richard Disney and Charles Grant, 2006, the economics of customer credit, ASCO typesetters, USA, p296*
[3] *Shirley Anderson, David B. Bau, and Gary A. Hachfeld, 2004, facts about credit scoring, university of Minnesota, USA*
[4] *Thomas Anthony, 2009, the geographies securitization and credit scoring, thesis submitted to the University of Nottingham for the degree of doctor of philosophy.*

Discriminant analysis (MDA). Firms usually design credit scoring systems to give quickly accept/reject decisions because they know that the cost of a single bad scoring mistake is usually rather small. Firms may have to re-evaluate their credit formula if bad debts increase.[1]

Credit scoring procedures based on statistical methods like Discriminant analysis, logistic and probit regression; in more recent developments, neural networks, genetic algorithms, and linear programming are used. The common idea behind these different methodologies is that there exist (at least) two populations of potential borrowers, good and bad types (with a lower and a higher average default probability, respectively). From a statistical point of view, it is a problem of correct classification, i.e. to design a procedure able to allocate a new observation into one of the two populations, minimizing a given objective function (typically is the cost of misallocation). Accordingly, individuals are separated on the basis of some observed characteristics belonging both to their socioeconomic background-age, income, gender, nationality, family size, etc. - and to its credit history - the number of credit cards, how much did the applicant borrowed, if it ever delayed a repayment and so on.[2]

Credit scoring is a scientific method that uses statistical models to assess an individual's creditworthiness based on his or her credit history and current credit accounts.[3]Besides that, it is a process to determine a customer's credit risk by comparing information about one customer to the credit performance of many other with similar credit profiles.[4]

The credit score of an individual or group has overtime become the yardstick frequently used to determine their creditworthiness. Past records of the applicant obtained and processed and a score is determined. A high or good credit score means that the applicant is suitable for business transactions while a low or bad credit score means that the applicant is not suitable for business transactions.[5]

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[1]*H. Kent Baker, Gary Powell, understanding financial management, Blackwell publishing, UK, p 178*
[2] *Marcello Bofondi and Francesca Lotti, 2005, Innovation in the Retail Banking Industry: Credit Scoring Adoption and Consequences on Credit Availability, Bank of Italy, Study Department*

[3] *Help me understand how credit works, customer Info USA, Bulletin.*

[4]*http://www.freddiemac.com/creditsmart/guide/pdf/CSIG_7_M6_UnderstandingCreditScoring.pdf .*
[5]*N.namdi I. Nwulu and Shola G. Oroja, 2011, A Comparison of Different Soft Computing Models for Credit Scoring, world Academy of Science, Engineering and Technology*

Credit evaluation is one of the most crucial processes in bank's credit management decisions. This process includes collecting, analysing, and classifying different credit elements and variables to assess the credit decisions. The quality of bank loans is the key determinant of competition, and profitability.[1] One of the most important kits, to classify a bank's customers, as a part of the credit evaluation process to reduce the current and the expected risk of a customer being bad credit, is credit scoring.

The term credit scoring could define on several conceptual levels. Most fundamentally, credit scoring means applying a statistical model to assign a risk score to a credit application or to an existing credit account. On a higher level, credit scoring also means the process of developing such a statistical model from historical data. On yet a higher level, the term also refers to monitoring the accuracy of one or many such statistical models and monitoring the effect that score-based decisions have on key business performance indicators.[2]

Credit scoring performed because it provides a number of important business benefits, all of them based on the ability to quickly and efficiency obtain fact-based and accurate predictions of the credit risk of individual applicants or customers. For example, in application scoring, credit scores used for optimizing the approval rate of credit applications.[3]

We suggest that to define credit scoring, the term should be broken down into two components, credit and scoring. Firstly, simply the word "credit" means "buy now, pay later". It is derived from the Latin word "credo", which means, "I believe" or "I trust in". Secondly, the word "scoring" refers to "the use of a numerical tool to rank order cases according to some real or perceived quality in order to discriminate between them by providing certain benchmarks for the reduction or expansion of loan appraisals, and ensure objective and consistent decisions". Therefore, scores might presented as

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[1] *Jesilin Manjula, 2001, How credit scoring systems help in managing credit risk , account receivables, sunway.edu.my/university/sites/default/files/.../Jesilin%20Manjula.pdf*

[2] *Allen Berger, Andrian Cowan, and W. Scott Frame, 2009, the surprising use of credit scoring in small business lending by community banks and the attendant effects on credit availability and risk, Federal bank of Atlanta, www.frbatlanta.org/pubs/wp/working_paper_2009-9.cfm*
[3] *http://www.amwizard.cn/creditscoring.html#7.9*

"numbers" to represent a single quality, or "grades" which may be presented as "letters" or "labels" to represent one or more qualities.[1]

Quantitative credit scoring models have been developed for the credit granting decision in order to classify applications as 'good' or `bad', the latest being loosely defined as a group with a high likelihood of defaulting on the financial obligation,[2] to insure that credit users will pay back the money loaned to them.[3] Lenders use these scores to help them make lending decisions. However, it is often only one factor in the lender's decision to extend credit. Credit scoring provides a uniform system for analysing and evaluating creditworthiness of a potential borrower representing an estimate of his future loan performance.[4]

Consequently, credit scoring could simply define as "the use of statistical models to transform relevant data into numerical measures that guide credit decisions. It is the industrialisation of trust; a logical future development of the subjective credit ratings first provided by nineteenth century credit bureaux that have been driven by a need for objective fast and consistent decisions, and made possible by advances in technology.[5] Therefore, scoring is the use of the knowledge of the performance and characteristics of past loans to predict the performance of future loans.[6]

Above all, scoring technology analyses historical client data, identifies links between client characteristics and behaviour, and assumes those links will persist to predict how clients will act. The technology can help a macro/micro-finance institution analyze how its clients have behaved in the past to make more reliable loan application decisions, devise more effective collections strategies, better target marketing efforts, and increase client retention. Hence, scoring technology systems can be a foundation for advanced

[1]*Dr. S. S. Satchidananda, 2006, Multi-Step Method for Analysis of Credit Risk of Bank Loans, centre of Banking and IT, CBIT-IIITB Working Paper no 6*
[2] *A. S. Vieira, João Duarte, B. Ribeiro and J. C. Neves, 2004, Improving Personal Credit Scoring with HLVQ-C, Department of Informatics Engineering, University of Coimbra, P-3030-290*

[3] *The ABCs of Credit Scoring, Coastal Housing Partnership,www.coastalhousing.org/**credit_scoring**.pdf*
[4] *W. Scott Frame, Aruna Srinivasan, and Lynn Woosely, The effect of credit scoring on small-business lending, www.frbatlanta.org/filelegacydocs/wp0106.pdf*
[5] *Anthony Saunders ; and Linda Allen, 2010, third edition, credit risk measurement in and out of the financial crisis, John Wiley and Sons, Inc., Hoboken, New Jersey, pp 117-121*
[6]*Mark Schreiner, 2004, Benefits and Pitfalls of Statistical Credit Scoring for Microfinance, Washington University.*

capabilities, such as pricing loans based on individual client risks and more accurately provisioning against loan losses.[1]

It well known that lenders use credit scores to regulate the extension of customer credit. People with high scores offered credit on terms that are more favourable. People who default on their loans experience a decline in their scores and, therefore, lose access to credit on favourable terms. In short, a credit score generated by a model that statistically correlates the frequency of default with information in a person's credit history,[2] and it is statistically based evaluation of borrower credit quality as part of the loan underwriting process, has been a part of customer lending for decades.[3]

People who run up debt also experience a decline in their credit scores and have to pay higher interest rates on new loans. While credit scores play an important role in the allocation of customer credit, credit scoring not been adequately integrated into the theoretical literature on, consumption smooth and asset pricing.[4]

Moreover, credit scoring is a system used by banks and other credit institutions to decide what band of riskiness a borrower belongs in. It works by assigning weights to various characteristics, such as bills, credit history, repayment history, outstanding debt, numbers, age and types of accounts, whether the customer is householder and so on.[5] Other factors that used in evaluating the risk premium would include historical and projected cash flow, earnings volatility, collateral, and wealth of the borrower. The score obtained by separating historical data on defaulters from non-defaulters and statistically modelling default using Discriminant analysis or binary models of econometric estimation (logit, probit) to predict default.[6]In addition, credit scoring is not not just a means to judge lender's financial reputation; it is a valuable tool in getting low interest rates with loans and insurance policies.[7]

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[1]*Daniel G. Salazar, 2003, Credit Scoring, CGAP, http://www.cgap.org/docs/OccasionalPaper_07.pdf.*
[2]*Satyajit Chatterjee and Dean Corbae, 2005, A Recursive Equilibrium Model with Credit Scoring and Competitive Pricing of Default Risk , University of Minnesota and CAERP*
[3] *Elaine Fortowsky and Michael Lacour-Little, 2001, Credit Scoring and Disparate Impact, Wells Fargo Home Mortgage*
[4]*Satyajit Chatterjee and Dean Corbae, 2010, A Theory of Credit Scoring and Competitive Pricing of Default Risk, University of Minnesota and CAERP*
[5]*Customer concerns for Older Americans, national customer law centre INC, Boston, www.nclc.org*
[6]*Kent Matthews and John Thompson, 2005, the economics of banking, John Wiley & Sons Ltd, England, P 185.*
[7] *How Credit Scoring Helps, finance article No.22719, http://www.articlesbase.com/finance-articles/howcredit-scoring-helps-112453.html*

It is true that credit score represents customer's history of how he has handled previous financial transactions and is an indication of how he will handle future financial situations. A higher credit score represents a lower risk to the lender. In addition, it is a method of modelling potential risk of credit applications. In general, it employs statistical techniques and historical data to produce a score that financial institutions can use to evaluate credit applicants in terms of risk. This helps them classify applicants into "good" and "bad" risk groups and assists risk managers to make risk related decisions. Essentially the problem credit scoring is trying to solve can be categorised into general population classification tasks.[1] The credit score can affect the cost of customer's debt, with lower interest rates and fees reserved for borrowers with better scores. Lenders may subject those with lower credit scores to lower loan limits and may restrict loans to only been spent on school charges.[2] Furthermore, a credit score is a number that lenders use to estimate risk. Experience has shown them that borrowers with higher credit scores are less likely to default on a loan.[3]

Accordingly, credit scoring is a quick, accurate, and consistent scientific method of assessing credit risk. The scores based on data about an applicant's credit history and payment patterns stored in a credit bureau's file on that applicant when a credit report requested. Credit scores calculated by statistical models that assign points to factors indicative of repayment. These models imbedded in software that resides in credit bureaus or lender databases. A score based on data rather than human assessment and judgment. This is what makes credit scoring an objective assessment tool, as opposed to a subjective one.[4]

Furthermore, credit scoring is the use of statistical models to determine the likelihood that a prospective borrower will default on a loan. Credit scoring models are widely used to evaluate business, real estate, and customer loans. In addition, Credit scoring is the set of decision models and their underlying techniques that aid lenders in the granting of customer credit. These techniques decide who will get credit, and how much credit they should get, and what operational strategies will enhance the profitability of

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[1] *Yingxu Yang, 2004, Adaptive Credit Scoring with Kernel Learning Methods, SHS Information systems*
[2] *Carnegie Mellon, Know Your Credit History, http://www.finaid.org/loans/creditscores.phtml*
[3] *Dave Capra, 2007, Your Guide to Perfect Credit, second edition, Washington, p 25.*
[4] *Credit scoring and its role in lending a guide for the mortgage professional, Free Report Provided by The HOPE Project, www.hopeinfo.net.*

the borrowers to the lenders.[1] Thus, a credit scoring system commonly used by lenders to determine the risk a borrower represents related to repayment. In brief, credit scoring is a system creditors use to help determine whether to give a customer credit.[2] Namely, credit scoring models can even distinguish differences in the credit picture of accounts with similar payment histories,[3] and particularly only give probabilities about the likelihood that a company will or will not default based on its past credit history.[4]

From the perspective of the researcher ,Credit scoring cannot predict individual loan loss; rather it predicts the likelihood or odds of a "bad" outcome, as defined by each bank usually this will be some level of average or total days in arrears at which associated costs make the loans unprofitable. Nor should a credit scoring system alone approve or reject a loan application; rather the underwriter must decide how he or she will incorporate the credit score into the loan review. Finally, credit scoring not meant to increase approval rates; rather, it promotes consistency and efficiency while maintaining or reducing historic delinquency rates.[5] It also allows the users to focus their attention and time on applications that are not obvious approvals or obvious declines.[6]

3.2.2 BEHAVIOURAL PROPENSITIES:

Credit scoring is usually associated with the use of statistical techniques to assess the risk of non-payment, but it goes further than that. Indeed, sometimes credit scoring is classed as a form of propensity scoring, where customers' propensity to behave in certain ways is measured. Propensity means 'inclination' or 'tendency', and although it is commonly associated with marketing and response scoring, it really covers the entire spectrum of human behaviour(Table 3.1). It split into the 4Rs of credit scoring:[7]

Risk—will the customer do something to put us at risk of financial loss?

Response—will the customer respond to an offer?

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[1] *Report on the credit scoring data of insurers in Maryland, 2004*
[2] *Ralph R. Roberts, Hoe Kraynak, 2009, financing real estate investments for Dummies, Wiley publishing Inc, India, p 254*
[3] *Maria Pippidis, 2004, Credit Scoring , University of Delaware,FM-C-04*
[4] *Tom Diana, 2005, credit risk analysis and credit scoring "Now and In The Future", the publication for credit and finance professionals, national association of credit managements.*
[5] *Barin Rogerson, 2007, credit scoring and profit-based pricing, Motor Finance Magazine.*
[6] *Dean Cair and Robert Kossmann, 2003, credit scoring: is it right for your Bank?., BANNOCK Consulting.*
[7] *Raymond Anderson, 2007, the credit scoring toolkit, Oxford University press Inc, New York, pp 13-15*

Retention—will the customer stay, or move on?

Revenue—how much income is expected?

3.2.2.1 RISK

Scorings greatest benefit has been in the realm of risk assessment. 'Risk' being used here in the traditional sense of investing, relating to whether an investment could diminish or destroyed. It covers not only loss probability, but also loss severity. There are three basic types of risk scoring been used by businesses: credit, fraud, and insurance scoring.

Credit risk is the primary area where scoring is used, and is logically what the term 'credit scoring' is usually associated with. Credit risk scores used primarily to predict delinquencies, and include most application, behavioural, customer, collections, and bureau scores. They are often the only scores used to make decisions, but value can also gained by combining them with response, retention, and revenue scores; or alternatively, by deriving probability-of-default(PD), exposure-at-default (EAD), and loss-given-default (LGD) estimates.

Table 3.1 Aspects of customer behaviour

Risk	Credit	Will he pay?
	Fraud	Will he cheat?
	Insurance	Will he claim?
Response	Response	Will he call?
	Cross-sell	Will he buy others?
Retention	Churn	Will he use me andleave?
	Attrition	Will he leave?
Revenue	Utilisation	Will he use it?
	Profit	Will it be worth it?

Fraud and credit risk may seem closely related, but fraud risk viewed as an operationa lrisk, and treated totally separately. The impact of fraud on the financial services sector has been huge, costing millions each year. Application fraud scorecards are difficult to develop, because of the low numbers of known frauds, which exacerbated because it is difficult to differentiate between 'unable to repay', and 'no intention of repaying.' There are also fraud-scoring systems that can run on a daily basis, looking for inconsistencies at transaction level. Finally, insurance risk is the risk that an applicant will claim on an insurance policy. This falls outside of the field of credit, but is closely related, because it often relies on credit information, in particular that obtained from the credit bureaux. The use of credit data in insurance underwriting is contentious, yet extremely strong correlations have shown between credit data and short-term insurance claims (household, personal, and motor vehicle). The most likely explanations are that individuals who keep their credit affairs in order are: (i) likely to take better care of their possessions; and (ii) less likely to give up their no claim bonus for a small claim.

3.2.2.2   RESPONSE

It costs a lot of money to attract new customers, especially where lenders do targeted marketing campaigns using mail shots or other channels. Response scoring used to limit mailings to those people who are most likely to result in a profitable relationship for the company. This was one of the first applications of scoring; Sears used it in the early 1950s to decide whom it would send its mail order catalogues to, and it is still widely used today. Lenders also try to grow their businesses using cross sales, and use scores to assess which other products would be best suited for a customer, based upon demographic characteristics, existing account holdings, demographic details, and other information.

3.2.2.3   RETENTION

We also wish to know whether customers will keep their business with us, as the cost of account acquisition can be high. Churn scoring used at the time of application to assess whether or not the newly acquired customer will stay long enough for the account to be profitable, especially where special offers made. Customers may avail themselves of the offer, but not hang around afterwards—leaving the lender with costs, but no revenue. Lenders may also use attrition scoring to predict inactivity or closure of existing accounts, and then design strategies to keep them active and open.

3.2.2.4 REVENUE

The final area of interest is revenue. Lenders wish to focus upon customers who will be profitable, and may use some simple modelling to assess whether the potential revenue will be sufficient for the lender to make a profit. This can be done by modelling profit or revenue directly, or by using the level of utilisation (balance, activity) as a surrogate. Profit scoring should be the ultimate goal, but it is affected by the number of decisions made along the way, in various parts of the business—limit increases, collections, marketing, etc. It is also difficult to implement, because of problems apportioning costs at the account level.

3.2.3 PHILOSOPHICAL APPROACH TO CREDIT SCORING:

For a true understanding of the building blocks required for quality, scorecards it is necessary to understand both the basic philosophy of hoe scoring systems work and certain critical assumptions on which they founded. The basic premise is that analytical technology allows us to learn from our past. Scores are developed or "trained" on past data in order to predict the future performance of new applicants. It assumed that there are relationships among the variables available at the time of underwriting that are different and unique for the "goods" and the "bads" of the applicant population. It also assumed that analytical technology could accurately capture these relationships (or empirical approximation of them).

Once these relationships are identifies it is then assumed that the future will resemble the past and these relationships can be used to separate the goods from the bads of today's applicant population. This assumption is like the assumption underlying the expectation that human guideline underwriting will work – the underwriter's past experience can be used to separate the goods from the bads, the difference, however, is that scores derive their "experience" from a much larger dataset. Scores never have a subjective "opinion."[1]

The philosophy underlying credit scoring is pragmatism and empiricism. The aim of credit scoring and behavioural scoring is to predict risk, not to explain it. For most of the last 50 years, the aim has been to predict the risk of a customer defaulting on a loan, and the use of credit scoring has increased tremendously as a tool for underwriting and

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[1] *Elizabeth Mays, 1998, credit risk modelling, design and application, Fitzroy Dearborn publishers, USA, pp 60-62*

administering all forms of retail credit, including credit cards, direct and indirect instalment loans, residential mortgages, home equity loans, and small business credit. Credit scoring models can offer a fast, cost-efficient way to make sound decisions based on bank or industry experience.[1]

More recently, the approach has been to predict the risk that a customer will not respond to a mailing for a new product, the risk that a customer will not use a credit product, or even the risk that a customer will move an account to another lender. Whatever the use, the vital point is that credit scoring is a predictor of risk, and it is not necessary that the predictive model also explain why some customers default and others do not. The strength of credit scoring is that its methodology is sound and that the data it uses empirically derived.[2]

Thus, credit-scoring systems based on the past performance of customers who are similar to those who will be assess under the system. This usually done by taking a sample of past customers who applied for the product as recently as it is possible to have good data on their subsequent performance history. If that is not possible because it is a new product or only a few customers have used it in the past, then systems can be built on small samples or samples from similar products, but the resultant system will not be as good at predicting risk as a system built on the performance of past customers for that product.[3]

There is a parallel development to credit scoring in using scoring approaches to predict the risk of companies going bankrupt. Although this has provided some interesting results connecting accounting ratios to sub sequent bankruptcy, because samples are so much smaller than in customer credit and because accounting information is open to manipulation by managers, the predictions are less accurate than for the customer credit case.[4]

Generally, credit score is a number generated by a computer program based on information from a credit history as recorded by a credit bureau such as Experian,

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[1] *Credit scoring models, OCC Bulletin, OCC 97-24,* ithandbook.ffiec.gov/media/.../occ-bl-97-24_credit_scor_models.pdf

[2] info@creditresourcecorp.com.

[3] *Credit scoring: how does it affect you? Kentucky Environmental & Public Protection Cabine,* http://doi.ppr.ky.gov/kentucky/.

[4] *Lyn C. Thomas, David B. Edelman and Jonathan N. Crook, 2002, credit scoring and its applications, Thomas L.C , USA, pp 1-5*

Equifax, and Trans-union (the 'Big Three' credit bureaus). A credit score supposedly helps predict how creditworthy a customer is. That is, how likely it is that the customer will repay a loan and make the payments when due.[1] Besides, it helps the lenders in determining whether the customer have the financial strength to return the money within the given time period. Concisely, it is like a synopsis of your creditworthiness. Hence, carrying a good credit score is an asset and can assure you of a secured financial future. On the other hand, a bad credit score will result in higher cost when you need to borrow money. "There is not much anyone can do for those who will not do something for themselves." The same is applicable for credit scores. Your prime aim is to maintain a good credit score and lead a financially planned life.[2]

Where banks might use more sophisticated credit scoring technology that also include the personal credit history of the entrepreneur, this would be particularly beneficial for new firm owners who may not have a successful history or track record of commercial borrowing and repayment. Alternatively, loans to new entrepreneurs might depend more on "soft" information and relationships, while older firms might benefit relatively more from an established credit history.[3]

Credit scores could develop based on either qualitative or quantitative information on customer behaviour and characteristics. A system based on qualitative information called "subjective scoring."[4] Credit evaluation grids, which micro-lenders have used to organize and apply numeric scores to information collected in the lending process, is one example of subjective scoring tool, in the typically the weighting system used to develop an applicant's score is based on the experience and belief of the organization's underwriting staff. A system based of quantitative information stored in a database

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[1] *Chi Chi Wu, 2007, credit scoring and insurance: costing customers billions and perpetuating the economic racial divide, national customer law centre,* www.nclc.org/images/pdf/pr.../report-insurance-scoring-2007.pdf

[2] *Jason Holmes, 2009, credit score; the quintessential therapy for a happy pocket,*

http://www.debtconsolidationcare.com

[3] *Larry W. Chavis, Leora F. Klapper and Inessa Hove, 2010, the impact of the business environment on young firm financing, World Bank Group, policy study working paper series no 5322*

[4] *Frank H. Murkowski, Edgar Blatchford and Stan Ridgeway, 2003, Insurance credit scoring in Alaska, State of Alaska, Department of community and economic development*

called "statistical scoring." Statistical scoring is the type of credit scoring now used by most private lenders, and by credit bureaus.[1]

A "Credit Score" is calculated by a mathematical equation that evaluates on or more items of information that are included in a the subject Customer Report, measures the relative degree of risk a potential borrower represents to the lender or investor (in other words, is a statistical means of assessing how likely a customer borrower is to pay back a loan), and is provided via the national credit repositories.[2]Moreover, credit score is a number between 300 and 850, assigned to customer by one of three national credit bureaus. The number helps lenders decide how creditworthy you are the higher the score, the lower the risk.[3]

The use of such models has increased tremendously as a tool for underwriting and administering all forms of retail credit, including credit cards, direct and indirect instalment loans, residential mortgages, home equity loans, and small business credit.

To add to this growth, small and medium-sized banks have joined the large banks and other organisations in taking advantage of this tool. Non-traditional uses for scores are also been created. For instance, some scoring models have developed on the commercial side for ascertaining the probability of fraud or theft.[4]

Credit scores are an instrument used by any lending institution to evaluate risk. Credit scores may lead to lower interest rates when borrowing money in any facet-automobiles, mortgages, instalment loans, revolving credit cards/ lines of credit, and any type of insurance. Credit scores fall as one of the three essential elements in gaining mortgage loan approval. Scores will also play a vital role in attaining affordable Mortgage Insurance. Credit scores and responsible borrowing may even have an effect on successful job searching. In our business, it is important for us to treat the borrower as a person and if possible improve their lives not just their mortgage rate. Credit scoring although seems difficult to understand, follows a common sense approach.[5]

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[1] *Andrea Berger and Marisa Barrera, 2007, Credit scoring for microenterprise lenders, The Aspen institute/FIELD, USA*
[2]*Credit Scoring Services Amendment, LandAmerica, National Lenders Services, ATLANTA 428064v1, www.docstoc.com/.../CREDIT-SCORING-SERVICES-AMENDMEN...*

[3]*Jason Alderman, The Ups and Downs of Credit Scoring, www.nslp.org*
[4]*http://www.ibbm.org.my/v2/wp-content/uploads/2011/05/KREA001-Credit%20Scoring.pdf.*
[5]*www.foxridgehomes.com/docs/Understanding%20Credit.pdf*

Those methods also used to separate well from bad risks commonly used for the scoring of standardized credit products. The aim of creating new selection rules is to find a mechanism that perfectly separates the applicants who will fully repay from defaulters. Probably, a perfect mechanism cannot be found due to certain, however small, default probabilities even for very good risks, but it is worth trying to find or to improve a credit scoring system that is superior to other possible ones.[1]

The first step in a scoring project is to identify the type of customers and products scoring for which the scoring model will be use. Rather than one manager or one department making this decision unilaterally, the organization should form a working group/steering committee with representatives from each functional area (credit risk, credit operations, marketing, IT, consultancy) that will be touched by credit scoring. This working group will guide the development and implementation of the scorecard. One or two senior managers should assume the role of "champion" to promote the proper use and understanding of scoring throughout the organization.[2]

Here are some other facts about credit scoring that we should keep in mind:

3.2.3.1 CUSTOMER NEEDS TO HAVE AND USE CREDIT TO HAVE A CREDIT SCORE:

The classic credit scoring formulas need at least one account on customer's credit report that has been open for six months and one account that has updated in the past six months. (It can be the same account.) If his credit history is too thin, or he has stopped using credit for a period, there might not be enough current data in his file to create a regular credit score. (That does not mean he cannot be "scored."

3.2.3.2 A CREDIT SCORE USUALLY IS NOT THE ONLY THING LENDERS CONSIDER:

In mortgage-lending decisions, in particular, lenders may weigh a lot of other information, including customer's employment history and stability, the value of his property refinancing, income, and the total monthly debt payments as a percentage of that income, among other factors. Therefore, although credit scores can be a powerful

[1]*Thomas Parnitzke, 2005, Credit scoring and the sample selection bias, Institute of Insurance Dean Economics University of St. Gallen, Switzerland*
[2]*Caire, Susan Barton, Alexandra de Zubiria, and others, 2006, a hand book for developing credit scoring systems in microfinance context, USAID, Washington.*

force in lending decisions, they might not be the sole determinant of whether customer gets credit.

3.2.3.3 CREDIT SCORING SYSTEMS WERE DESIGNED FOR LENDERS, NOT CUSTOMERS:

In other words, scores were not creating to be easy to understand. The actual formulas, and many of the details of how they work, are closely guarded trade secrets. The credit-scoring companies do not want the process to be transparent or predictable. They fear that letting out too many details would allow competitors to copy their formulas. They also worry that their formulas would lose their ability to predict risk if customers knew exactly how to beat them. We know more about the formulas than ever before, and certainly enough for you to improve your score. But given the number of variables involved and the mystery still surrounding credit scoring, customer may not be able to forecast exactly how every action will affect a score, or how quickly.[1]

3.3 CREDIT SCORING OBJECTIVES, BENEFITS, AND ROLE IN CUSTOMER LENDING PROCESS:

3.3.1 CREDIT SCORING OBJECTIVES:

Scoring techniques applied for many different business objectives. The main objective of scoring is to improve customer-facility selection to reduce future losses. The success of scoring systems has made them a key decision or decision support tool in modern risk measurement and management.

Credit scores used to calculate measures of expected or average loss of a credit portfolio. The expected loss on the portfolio determines the provision that the bankbooks. In order to determine expected loss, the default risk of the credit portfolio needs to adequately quantified and credit scores may prove to be very useful inputs for this. Closely related is the calculation of the regulatory and/or economic capital, which defines the buffer capital that protects the financial institutions and depositors against unexpected losses. In some applications, regulatory and economic capital calculations rely on credit scores as inputs for measuring the default risk of a portfolio.

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[1] *Liz Pulliam Weston, 2009, credit score; your money and what is at stake, publishing as FT press, New Jersey, p 17*

Another use of credit scores is pricing. Risk-based pricing (sometimes also called risk-adjusted pricing) sets the price and/or characteristics of the credit product based upon the perceived risk as measured by the credit score. Customers having good credit scores and thus posing low risk can rewarded by lower interest rates, whereas riskier customers having low scores get higher interest rates, and have to provide additional collateral/guarantees, or need to cap their credit amounts. A customer first applies for an initial offer and provides the financial institution with all his/her application details. A credit score is then calculated and used to further fine tune the offer in order to minimize the default risk. Financial institutions may then segment their customer population based on the credit scores and work out specific credit configurations for each segment, or they can also individually risk-price their customers.

Many financial institutions use securitization by pooling credit assets based on risk homogeneity and selling them off to third-party investors in order to reduce their credit risk. Credit scores can be very useful in slicing and dicing the credit portfolio into tranches with similar risk, and pricing the corresponding securities.

Credit scores, and more specifically bureau scores, are also useful to other non-financial companies in order to improve their decisions. An example is electricity and telecom operators that may want to use bureau scores in their Limitations 113 pricing or contracting policies. In addition, employers could use bureau scores to get a better idea of the profile of job applicants, and landlords can use them to investigate the solvency of their future renters. Insurance companies could use credit scores to set insurance premiums or deciding for whom to accept the insurance policy. Note that most of these applications are still very controversial and subject to much debate.

Automated application scorecards allow fast credit approval decisions and reduce customer-waiting time, which possibly increases the acceptance probability of the applicant if the score system accepts the loan. Automated scorecards are typically less expensive than human expert scores and ensure consistent decision-making.[1]

The purpose of credit scoring is to measure the risk of extending credit in order to make a judgment about whether or not credit should be extend, the credit limits that should be apply, and whether any security should be obtained. Credit rating or credit scoring is the

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[1]*Tony Van Gestel, Bart Baesens, 2009, credit risk management, Oxford University press Inc., New York, pp 105-114*

use of a mathematical model which measures the likelihood that a customer will repay (or not) their debt on time. Credit scoring often uses a database built using observations of a large number of customers, some of whom have defaulted on payment and most of whom will not have defaulted. Statistical techniques then used to estimate the probability of default for a particular credit applicant based on historical data. The credit-scoring model predicts the probability of default for new customers based on their characteristics compared with defaulting and non-defaulting customers. A scaling process is then applied to give a credit score, which ranks customers, by the degree of risk faced by a lender.

Decisions to extend credit need to be properly documenting and approved by a manager with authority although the authority level may change with the amount of credit been extended.[1]

3.3.2 CREDIT SCORING BENEFITS:

Credit scoring has some obvious benefits that have led to its increasing use in loan evaluation. First, scoring greatly reduces the time needed in the loan approval process. Credit scoring can reduce this time to well under an hour, although the timesaving will vary depending on whether the bank adheres strictly to the credit score cut-off or whether it re-evaluates applications with scores, near the cut-off.

This timesaving means cost savings to the bank and benefits the customer as well. Customers need to provide only the information used in the scoring system. Therefore, applications can be shorter. In addition, the scoring systems themselves are not prohibitively expensive. Even if bank does not will to depend solely on credit scoring for making its credit decisions, scoring can increase efficiency by allowing loan officers to concentrate on the less clear-cut cases.

Another benefit of credit scoring improved objectively in the loan approval process. This objectively helps lenders ensure they are applying the same underwriting criteria to all borrowers regardless of race, gender, or other factors prohibited by low from been used in credit decisions. Bank regulators require that the factors in a scoring model have some fundamental relationship with creditworthiness. Even if a factor is not explicitly banned. If it has a disparate impact on borrowers of a certain race or gender or with respect to some other prohibited characteristic, the lender needs to show there is a

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[1]*Above no.30*

business reason for using the factor and there is no equally effective way of making the credit decision that has less of a disparate impact. A credit-scoring model makes it easier for a lender to document the business reason for using a factor that might have a disproportionately negative effect on certain groups of applicants protected by low from discrimination. The weights in the model give a measure of the relative strength of each factor's correlation with credit performance.

But not every-one agrees that the objectively in scoring will benefit minorities or low income individuals, who may have had limited access to credit in the past. Some argue that these potential borrowers not well represented in the loan data on which the scoring models have built, the models are less accurate predictors of their loan performance.[1]

Credit scoring requires less information to make a decision, because credit-scoring models have estimated to include only those variables, which are statistically and / or significantly correlate with repayment performance; whereas judgemental decisions, prima facie, have no statistical significance and thus no variable reduction methods are available. Credit scoring models attempt to correct the bias that would result from considering the repayment histories of only accepted applications and not all applications. They do this by assuming how rejected applications would have performed if they had accepted. Judgemental methods usually based on only the characteristics of those who were accepted, and who subsequently defaulted. Credit scoring models consider the characteristics of good as well as bad payers, while, judgemental methods generally biased towards awareness of bad payers only. Credit coring models built on much larger samples than a loan analyst can remember. Credit scoring models couldsee to include explicitly only legally acceptable variables whereas it is not so easy to ensure that such variables ignored by a loan analyst. Credit scoring models demonstrate the correlation between the variables included and repayment behaviour, whereas this correlation cannot be demonstrated in the case of judgemental methods because many of the characteristics which a loan analyst may use are not impartially measured. A credit scoring model includes a large number of customer's characteristics simultaneously, including their interactions, while a loan analyst's mind cannot arguably do this, for the task is too challenging and complex. An additional essential benefit of credit scoring is that the same data can be analysed easily and clearly by different credit analysts or

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[1] *Loreta J. Mester, 1997, what's the point of credit scoring?, federal reserve bank of Philadelphia, business review.*

statisticians and give the same weights. This is highly unlikely to be so in the case of judgemental methods.

Some other privileges of credit scoring has been summarised as follows: more efficient processing time, and subsequent support for the decision-making process; minimization of credit process costs and effort; fewer errors made; provision of estimations to be compared in post audits; inclusion of variables supported through objective analysis to assess the credit risk; modelling based on real data; interrelation between variables are considered; fewer customer -information needs for credit decisions; the cut off score can be changed according to environmental factors affecting the banking sector; acceptance of only authorized factors considered by well known institutions.

Furthermore, credit-scoring models are only as good as the original specification, and a further limitation is that the data are historical. Either the variables or weights, or both, assumed constant over time, which makes the model less accurate, unless it frequently updated. This problem could reduce or even minimised if banks keep records of their type I and type II errors, and apply a new or up -dated model to address any necessary changes. A serious problem is that the model imposes a dichotomous outcome: either the borrower defaults or not. Indeed, a range of possible outcomes exists, from a delay in interest payments to non-payment of interest, to outright default on principal and interest. Often the borrower declares a problem with payments, and the loan terms could renegotiated. These different outcomes can be included, but only two at a time.[1]

The benefits of scoring include reduced loan losses, greater client loyalty, and ability to adjust interest rates and fees according to risk (risk-based pricing). Most importantly scoring can reduce time in collections and introduce the lender to explicit quantitative analysis as an aid to decision making by managers.

Reduced loan losses are probably the smallest benefit of scoring, if only because most lenders who could use scoring suffer very few defaults. Greater loyalty from super-goods is probably a greater benefit than reduced loan losses.

Given a score, the lender can manage risk by rejecting the loan application or modifying the loan contract. One such modification attempts to compensate, however, knowing

[1]*Hussein A. Abdou, John Pointon (2011), Credit scoring statistical techniques and evaluation criteria: a review of the literature, Intelligent Systems in Accounting, Finance & Management, University of Salford, UK 18 (2-3).*

how much to adjust prices can be complicated, especially without accurate estimates of the various components of costs and revenues.

The greatest benefit of scoring results from loan offers spending less time in collections and more time generating new business. Bad loans are costly mostly because collections eat up a lot of time. Scoring affect profit because rejecting super-bads and modifying borderlines means that loan offers must chase down fewer bads. They are then free to spend the time saved on marketing, evaluation, and disbursement. Many lenders except scoring to save them more time in evaluation than in collection. Most loan offers, however, spend as much time in collections as in evaluation and it must reiterate that scoring cannot substitute for qualitative evaluation. Perhaps the most important benefit of scoring in the long turn is to what manager's appetite for decision making aided by explicit, quantitative knowledge of trade-offs derived from analysis of the database.[1]

Credit scoring has many benefits that accrue not only to the lenders but also to the borrowers. For example, credit scores help to reduce discrimination because credit scoring models provide an objective analysis of a customer's creditworthiness. This enables credit providers to focus on only information that relates to credit risk and avoid the personal subjectivity of a credit analyst or an underwriter. In the United States, under the equal credit opportunity Act, variables of overt discrimination such as race, sex, religion, and age cannot included in the credit scoring models. Instead, only information that is non-discriminatory in nature and that has been proven to predictive of payment performance can be included in the models.

Credit scoring also helps to increase the speed and consistency of the loan application process and allows the automation of the lending process. As such, it greatly reduces the need for human intervention on credit evaluation and the cost of delivering credit. With the help of credit scores, financial institutions are able to quantify the risks associated with granting credit to particular applicant in a shorter time.

Further, credit scores can help financial institutions determine the interest rate that they should charge their customers and to price portfolios. Higher risk customers charged a higher interest rate and vice versa. Based on the customer's credit score, the financial institutions are also able to determine the credit limits to be set for the customers. These

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[1]*Mark Scheiner, 2003, scoring: the next breakthrough in microcredit, occasional paper no 06, CGAP, Washington D.C, pp 27-29*

help financial institutions to manage their accounts more effectively and profitably. As an extension, profit scoring could be used to maximize profits across a range of products.

Related to above, credit scoring models have enables the development of the sub-prime lending industry where sub-prime customers have poor credits and fall short of credit acceptance and risk. They may not meet the requirements for traditional financing because of credit impairment, missing data in their credit histories, or difficulty in validating their income. One of the major factors in the progress of sub-prime lending has automated underwriting, which allows sub-prime mortgage loans to be package as investment securities.[1]

Credit scoring offers a number of benefits that can enhance banks' lending performance. The primary benefits include:

1- DELINQUENCY REDUCTION:

One benefit of credit scoring is that a lender can improve its overall portfolio performance as staff is better able to identify, and then decline, loan applications from individuals who are likely to result in "bad" loans, however, the organization chooses to define that term;

2- INCREASED CONSISTENCY IN DECISION-MAKING:

One of the drawbacks to subjective decissioning is that different underwriters or loan officers may value or see a particular characteristic or factor in different ways, based on their personal experiences;

3- GREATER CLARITY IN THE DECISION PROCESS:

Credit scoring can also make the decision process more explicit. The score is based on a set of mathematical formulas. If staff has access to and understands these formulas, then it can be clear to all how and why a particular score generated;

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[1] *HainChyeKoh, Wel Chin Tan, and Chwee Pang Goh, 2006, A two-step method to construct credit scoring models with data mining techniques, international journal of business and information, volume 1 number 1, pp 96-118*

4- IMPROVED EFFICIENCY IN THE LENDING PROCESS:

Increased efficiency is one of the primary reasons that lenders use scoring. By identifying, which factors are predictive of repayment, lenders can choose to eliminate factors that are not predictive, thereby, reducing the amount of information that collected and analysed during the underwriting process. Lenders also can elect to concentrate their underwriting resources on those applicants who show greater likelihood of delinquency;

5- DEVELOPMENT OF NEW OR DIFFERENTIATED PRODUCTS:

Credit scoring also can provide information that allows lenders to tailor their products more closely to their customer's behaviour and demands.

6- IMPLEMENTATION OF RISK-BASED PRICING:

Most lenders charge interest rates that are well below their costs of providing credit. Some lenders have attempted to address this problem by moving toward risk-based pricing, a system in which the interest rates on its loans vary according to the risk level of each loan. In order to implement risk-based pricing, a lender must have a means or process for assessing the level of potential risk in a loan. This process made easier with scoring, as the score provides information about the likelihood that a borrower will repay;[1]

7- LOWER COSTS:

Evaluation systems such as credit scoring reduce the role of human evaluation, with the potential for reducing the cost of delivering credit;

8- IMPROVED ACCURACY:

As scoring system evolve and improve, they will be more effective at predicting actual loan performance;

9- Better products and marketing: credit scoring models allow lenders to tailor the marketing effort to meet the needs of market niches;[2]

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[1] *Above no.113*
[2] *Justin G. Longencker, Carlos W. Moore, and J. William Petty, credit scoring and the small business; a review and the need for study, Baylor University, department of finance.*

10- Evaluates all applicants by the same criteria. Options do not enter the scoring equation empirically derived facts replace myths and personal prejudices about what constitute a good future customer;

11- Changes in a customer's credit performance will change a credit score. The key is that as individual credit patterns change, score are likely to change. While the "scoring scale" remains constant, a customer's place on that scale may change;

12- **SPEEDS UP CREDIT DECISIONS:**

Scores help lenders make decisions more rapidly and often with less documentation;

13- Helps make more credit available. By helping lenders control losses and cost, scoring helps make more capital available to customers;[1]

14- Streamline the lending process;

15- Improve lone officer efficiency;

16- Increase the consistency of the evaluation process;

17- Reduce human bias in the lending decision;

18- Enable the bank to vary the credit policy according to risk classification, such as underwriting or monitoring some lower risk loans without on-site business inceptions;

19- Better quantify expected losses for different risk classes of borrowers; and

20- Reduce time spent on collections, which in some markets claim up to 50 percent of loan officer's time.[2]

3.3.3 THE ROLE OF CREDIT SCORES IN CUSTOMERS LENDING:

In the last 10 to 15 years there has been a revolution in the financial services industry, lenders have rushed to embrace automated decision making and modelling to speed loan decisions and manage credit risk.

Although, credit scoring has used by lenders in last decade it has become pervasive throughout the customer-lending arena, expanding into areas like residential mortgages and small business loans. Credit scoring has become the standard method for evaluating

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[1] *Credit scoring and its role in lending – a guide for the mortgage professional, paper provided by the HOPE project, www.hopeinfo.net*

[2] *Dean Caire, Susan Barton, and Alexandra de Zubiria, 2006, a handbook for developing credit scoring systems in a microfinance context, USAID, Washington D.C*

the credit quality of residential mortgages since automated decissioning technologies introduced by the government-sponsored enterprises (GSEs).[1]

However, not everyone agrees that the objectivity in scoring will benefit minorities or low-income individuals, who may have had limited access to credit in the past. Some argue that since these potential borrowers not well represented in the loan data on which the scoring models have built, the models are less accurate predictors of their loan performance. This is a legitimate concern. However, it need not be the case that the models are less accurate, since the factors and their weights identified in the model could also be those that determine creditworthiness of the underrepresented groups.[2]

The evaluation of credit scoring continues to be an imprecise process. Over time, this approach needs to be standardizing across institutions and across borrowers. In addition, its scoring procedures need to make compatible with scoring systems elsewhere in the capital market.[3]

In spite of legislative on its effectiveness, credit scoring has a bright future there are two potential developments: risk-based pricing, and profitability. The darkest could on the horizon is perhaps a re-growth of privacy concerns that may stifle the availability of data for scoring systems:

3.3.3.1 RISK-BASED PRICING:

Unlike grantors of commercial credit, most providers of customer credit have a single house rate applicable to all customers. Thus, a commercial borrower may pay the bank prime plus one point, but the treasurer of the firm will carry a bankcard with a rare of 20 per cent, the same rate charged to all other cardholders from that bank.

Credit scoring provides the basis for grantors of customer credit to engage in risk-based pricing within their portfolios. Conceptually, the finance rate could adjust for each customer, just as bank now do for commercial loans. The policy would benefit customers across the board. The high-risk applicant would receive credit that he or she would not otherwise receive under a single "house" rate, albeit at a higher rate of

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[1] Above no.123
[2] Elizabeth Mays, 2004, credit scoring for risk managers (the hand book for lenders), photo disc Inc, United States of America, pp 3-5.
[3] Anthony M. Santomero, 1995, Commercial Bank Risk Management: an Analysis of the Process, Working Paper Series, university of Pennsylvania.

finance charge. The low-risk customer would receive a deservedly lower rate and not partially subsidize high-risk customers under a uniform house rate.

3.3.3.2 PROFITABILITY SCORING:

Credit scoring systems predict only payment performance. Essentially, the focus is whether a customer will pay satisfactorily (good versus bad), while the cut-off score reflects in part the relative losses on bad accounts versus the gains to be obtained from good accounts.[1]

Credit scoring has played a prominent role in making customer credit accessible to the not so rich in the U.S; most credit scoring systems rank everyone on a scale from 400 to 850 points. Where lenders are on the scale can affect a lot about customer's life.[2]

As mentioned previously, scoring is a methodology that offers an objective way to assess risk. It estimates the probability that an event will occur, by giving grades to known characteristics that have impact on the event. In the case of credit scoring, the forecasted event is the bad credit behaviour of the customer that can lead him to default. This is one of the main risks in lending: will the customer be able to repay integrally the loan and due interest on time?

Bad credit behaviour, called also negative credit behaviour, is when the borrower registers delinquency. He fails to meet his obligations with respect to the due principal and interest. This fact has the following consequences: the institution cannot use the money it was expecting; penalties start to be calculating on the overdue amount: and the institution starts to take actions to recover the money. Short delinquencies are not dangerous for the client and for the institution, but long or frequent delinquencies are risky because they can lead the client to default. The institution risks losing the money, while the entrepreneur risks to lose the business that, in many cases, is the only source of income for his household.

At the moment of credit approval no-body can certify that the customer will repay on time and integrally the loan and due interest. In fact, nobody can certify that recovery actions undertaken by the institution, once the customer in delinquency, will give any

[1]*Lyn C. Thomas, David B. Edelman, and Jonathan N. Crook, 2004, readings in credit scoring; recent developments, advances, and aims, Oxford university press, USA, pp 12-14*
[2]*Silver Lake, 2005, credit scores and credit cards, silver lake publishing, USA, p155*

result. In these conditions, the losses of the lender can be even bigger, as the institutions besides lent money could invest in collection activities and have no return. This is why financial institutions require collaterals, consigners and other guaranties meant to give a possibility to recover credit amounts if customers fail to pay. Nevertheless, even these guaranties cannot save the institutions from losses generated by bad loans.

In this conditions credit scoring appears to be a very useful tool. That is why it is so popular, if not a must, in mainstream finance, where this technique is used not only to help loans but also it is widely applied in marketing, debt recovery, provisions, fraud detection and churn prevention.[1]

3.4 DATA CONSIDERATIONS AND DESIGN:

While there may be a variety of possible data sources that can be used, they are not always readily available, or may be inadequate for current purposes. This section looks at various data issues that must be consider, many of which could lead to potential pitfalls during the design stage, if ignored. The topics covered are:

- ❖ **TRANSPARENCY**: the extent to which there is sufficient information available to do an adequate risk assessment.
- ❖ **QUANTITY**: the depth and breadth of data, which can be a function of the data's accessibility of the group been assessed.
- ❖ **QUALITY**: ability to meet specified needs, which could split into relevant, accurate, complete, current, and consistent.
- ❖ **DATA DESIGN**: types of data used, in practical or statistical terms, including special cases such as missing data and division by zero; and form design issues, to maximise data's value.

3.4.1 TRANSPARENCY:

The end goal is to provide a 'measure of creditworthiness', the appropriateness of which will depend how transparent borrowers' circumstances are, to whoever is doing the assessment.

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[1] *Lilian Simbagueba, 2004, Gehiner Salamanca, and VitaliBumacov, the role of credit scoring in micro-lending, LISIM*

The word transparent normally refers to a substance's ability to transmit light, but in this instance, it means 'easy to understand and analyse'. This refers to the bulk of application form data, data on past dealings, and data provided by the credit bureaux. In contrast, something is opaque if it is either 'impervious to light', or 'not easily understood'. A (potential) borrower's creditworthiness is opaque if:

3.4.1.1 NO CREDIT HISTORY: credit seekers may be creditworthy, but without current or past credit activity, nobody can tell—for example, first-time homebuyers who have no credit records, yet have flawless records at paying rent and utilities. The influence is greatest in youth, immigrant, subprime, and micro-finance markets.

3.4.1.2 INTELLIGENCE UNFRIENDLY: the information required for an assessment may be elusive, because the data is poorly structured, and/or the technology is poorly developed or non-existent. This is especially so in emerging environments.

3.4.1.3 HIGHLY COMPLEX: Credit-scoring needs structured data, which could only achieve through experience. The challenges are much greater where borrowers' circumstances are complex, and non-standard. This applies especially to wholesale lending, multiple counterparties, and complex deal structures.

Relative to borrowers, transparency issues include the following:

The risks associated with loan products are not transparent to the borrower.

- Borrower qualification criteria are not transparent to borrowers themselves, while hinders financial literacy initiatives, and confuses borrowers when they attempt to make sound financial decisions.
- Some borrowers did not provide adequate transparency relative to their income, employment, and cash reserves. There were so-called Ninja-loans made.
- Credit scores, which factor prominently in the credit granting process also loan securitization process, clocked in secrecy and scorecard developers have refused to divulgate federal regulatory agencies the details of their methodology. Borrowers are disadvantaged because scores may not accurately reflect their true risk, and they do not know how to improve their score.

- Relative to borrower, there is lack of transparency in their loan qualifications and consistency relative to lending criteria across the spectrum of lenders.

To lenders, transparency issues are mainly associated with the use of credit scoring. Credit scores play an especially important role in the approval and pricing of mortgage loans, the classifications of borrowers into subprime tire, the choice of products for which customers can qualify and so on. The perfect storm consisted of the following main factors:

- New loan products having risk attributes that were not sufficiently measured and monitored.
- A downturn in the housing market that saw home prices decline.
- Escalating mortgage loan payments for borrowers as their loan rate anniversaries began to arrive.
- Loose standards on income and employment verification.
- Backward and fragmented underwriting system that attempted to risk are borrowers from a variety of aspects and then classify them instead of first classifying them relative to all relevant factors and then risk rating them.[1]

3.4.2 DATA QUANTITY:

Credit scoring is primarily associated with the retail credit arena, where volumes are high, values are low, and data is plentiful. These are the little fish in the financial ocean, where one need only cast a net to both catch and study them. In contrast, when hunting whales (wholesale credit), there are fewer of them, making them more difficult to catch, observe, and understand. Over time however, new information sources been harnessed to allow broader application of credit scoring, at least to smaller whales.

The precondition for any analysis is having sufficient data, without which the results can be questionable. Data quantity discussed under the headings of:

3.4.2.1 DEPTH AND BREADTH:

Any analysis, including predictive model developments, is dependent on having sufficient data, in terms of both: depth, the number of cases; and breadth, the amount of information available for each. In retail credit, the commonly quoted minimum numbers for depth are 1,500 goods, 1,500 bads, and 1,500 rejects per scorecard (Lewis 1992;

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[1]*Clark Abrahams, Mingyuan Zhang, 2009, credit risk assessment; the new lending system for borrowers, lenders and investors, John Wiley and sons Inc, Canada, pp 21-23*

McNab and Wynn 2003, amongst others). No logic is provided for the choice of these numbers, but they: (i) have worked in practice for many years, to ensure representative samples; and (ii) are sufficient significantly to reduce the effects of multicollinearity and over fitting, when working with correlated variables.

As for breadth, no guidelines exist. There may be hundreds of characteristics at the start, yet the final model(s) will only have between 6 and 25 characteristics that: (i) make logical sense; (ii) are predictive; and (iii) must be available within the business process, where the scorecard is to use.

3.4.2.2 HOMOGENEITY/HETEROGENEITY:

To use a credit-scoring system cost-effectively [to create portfolios for securitisation], a lender must also make its small-business loans homogenous. Using a scoring system to rate heterogeneous loans would be like using the same machine to process many differently shaped and sized widgets.

The diversity of the group been assessed also plays a role. To develop a model, the group must be homogenous (similar) enough for it to be treated together, yet heterogeneous (dissimilar) enough, in terms of credit risk or whatever is being measured, that a scorecard can provide value. Where the group is highly heterogeneous, interactions can arise that make it difficult or impossible to treat the group as one. Some key factors to consider are:

3.4.2.2.1 DIFFERENT TARGET DEFINITIONS:

If there are different good/bad definitions, and transactions are put through substantially different processes, then they should not only have separate scorecards, but also be monitored separately. This applies especially for different products or markets.

3.4.2.2.2 DIFFERENT DATA SOURCES:

If groups are characterised by different data sources, it may be indicative of substantial interactions. This will be evidence where substantial groups lack data on some sources. Questions should ask, as it will influence the development.

3.4.2.2.3 SIGNIFICANT INTERACTIONS

In many instances, relationships between predictors and the target variable change from one group to another. Separate scorecards developed if the extra effort improves the predictive power, but the scorecards still monitored together.

In any of the above cases, the number of available records will be limited to those in the sub-group, and any rules relating to quantity (1,500 goods, etc.) would apply to each. At the other end of the spectrum, a group may be highly homogenous for risk, or at least according to the information available. This will be evident if a large proportion of cases fall into a narrow risk range; for example, if 30 per cent fall within a single risk range/grade/band, where on average the odds double from one to the next. Unfortunately, in this case little can be done in terms of depth! The only option is to increase breadth, by looking for new data sources, and even that may not help.

3.4.2.3 ACCESSIBILITY

By 'accessible', it meant that the data could obtain and used as part of a credit assessment. Many data may be predictive, but is inaccessible, because:

3.4.2.3.1 DATA COLLECTION:

It is available, but in an inappropriate format—like paper forms in files, cupboards, or dusty warehouses. If so, the forms have to be extract, software written, and data captured, before the scorecard could built. Today, this is less of an issue, as most volume-driven lenders have sophisticated data-gathering processes. It does however; still arise for green field developments in emerging environments.

3.4.2.3.2 COMMUNICATIONS:

Could the data be providing on an on-going basis to the business process where it will be use? This is an issue for bureau and internal characteristics, where infrastructure must be building, or updated, for data transmission, acceptance, and storage.

3.4.2.3.3 ANTI-DISCRIMINATION:

Details like gender, race, religion, and others may be prohibiting by legislation. They may ban outright, but sometimes allowed if their influence is small, and they form part of a holistic assessment.

3.4.2.3.4 DATA PRIVACY LEGISLATION:

Legislation may demand that information only be used for the purposes for which it was collected. As a result, credit grantors be restricted from using shared-performance data for marketing, or voters' roll data in credit decisions.

3.4.2.3.5 INFORMATION SHARING AGREEMENTS:

In order to access pooled data, lenders must meet membership requirements, by: (i) subscribing to the reciprocity agreement; and (ii) possibly, being in a specific line of business (retailing, banking, mail order). Most private credit bureaux offer their services to all credit grantors, and are quite relaxed when providing information for scorecard developments. They can however; stop data feeds to sub-scribers that breach the reciprocity agreement.

Retail credit providers have been able to develop relatively rich data sources, whether from application forms, credit bureaux, or internal systems, especially for new business origination, account management, and collections. In contrast, marketing suffers, not only because of data privacy legislation, but also because of concerns about poaching.

3.4.3 DATA QUALITY:

At the most basic level, information for managing risk is usually a by-product of a processing system designed for a completely different purpose and there is often insufficient policing of the quality of data going in at the front end of the system so the value of information produced is undermined.

One of the maxims applied to scorecard developments is 'garbage in, garbage out'. There is no statistical manipulation that can turn manure into mink! Indeed, just a few pieces of quality information can be crucial to a decision-making process. This section discusses the concept of data quality under the following headings:

3.4.3.1 RELEVANT

When developing credit-scoring models, the primary interest is in correlation, not causation; yet it is important to be conscious of potentially spurious correlations, and to ensure that the Characteristics are relevant to the problem at hand. Several questions could ask about each characteristic, to ensure that it is relevant:

(a) If it could measure, how predictive is the characteristic?

(b) If not measurable, is there any evidence of it having provided value elsewhere?

(c) Will it be readily available when needed, and if not, could it be obtain?

(d) Does it make logical sense?

For many green field developments, lenders and their underwriters will already have significant experience with lending to that market, and have a good feel for what the relevant inputs should be. If the data is not already stored electronically, it can be capture from application forms. In contrast, where lenders lack experience in a market or function, the task may not be so simple. What has used for credit risk assessments may not be as appropriate, for retention, revenue, or response. For example, risk assessments typically focus on monetary debit and credit values, but retention may be better serve by monthly transaction counts.

Relevance is also an issue, especially in terms of the data privacy (or fair credit reporting) legislation governing the credit bureaux. In the days of index cards and filing cabinets, personal character information used, sometimes based solely on hearsay and gossip, this is today no longer permit. It might have been valid when view in the context, but now considered irrelevant. This put pressure upon the bureaux to limit their data to that which can be show to be credit-related.

3.4.3.2   ACCURATE:

A key component of data's relevance is its accuracy. Does the data provide a true representation? If not, it becomes irrelevant, no matter how much is available. Given the amount of money invested to collect it, it makes sense for lenders to invest that little bit extra to ensure its accuracy. This applies not only to credit scoring, but also to any business process.

In credit, incorrect data can result in 'perceived' customer misbehaviour, with a significant adverse impact upon service levels. This is particularly true where account, contact, and/or address details are loaded incorrectly. If debit-order details are wrong, 'she' (the customer for the purposes of this paragraph, which is interchangeable with 'he') will be in default, once it fails. If she does not receive a memory-jogging reminder, she will not know until she notices the larger than expected balance in her bank account—if she has not already spent that. If the phone number is wrong, she will not receive collections' friendly telephonic reminder, telling her the payment is overdue. If

she runs away, saying she cannot pay, then recoveries and tracing will not have the correct previous address details to track her down. And so on .The scoring aspect is of primary interest, as it is affected by a much broader range of characteristics, than just contact and bank account details. In either case, the inaccuracies can stem from a number of sources, described here under the headings of:

3.4.3.2.1 POOR PROCESS DESIGN:

Process design plays a major role in ensuring data quality, which if done poorly can result in two types of errors: errors of commission, where data is incorrect, inconsistent, or duplicated; and errors of omission, where data is missing, either blank fields or missing records. Such errors can arise from a variety of different sources:

3.4.3.2.1.1 FORM DESIGN:

Forms may be long and confusing, and questions unclear. Thomas et al. (2002) provide an example, where when asked for telephone numbers, many applicants replied 'Yes' or 'No', but once a graphic was included, actual numbers were provided.

3.4.3.2.1.2 DATA CAPTURE:

Poor equipment, staff training, or checking procedures. This is relevant primarily where paper forms submitted, and processed centrally.

3.4.3.2.1.3 SYSTEM ERRORS:

There may be incorrect rules, or calculations, used to derive certain fields. This may be a design fault, or result from changes to upstream systems.

3.4.3.2.1.4 MATCHING:

Problems linking customers and their records. This applies especially to credit bureaux, who manage data provided by many subscribers, over whom they have little control. Errors can significantly influence both the accept probability, and the terms offered. Their effect will vary depending upon the type of error, and possibly the borrower characteristics. A CFA/NCRA (2002) report noted that errors have the greatest impact on thin files, especially individuals struggling to establish credit record students, immigrants, and subprime markets. It may result from the incorrect inclusion of derogatory information, or omission of positive performance. Where data is insufficient, no matter what the cause, it becomes impossible to provide a rating.

3.4.3.2.2 THE LIE FACTOR:

A significant factor in credit scoring (and any other selection process where the subject has a significant personal interest in a favourable outcome), is the temptation to cheat; which might range from simple embellishment to outright fraud. Embellishment is not only a temptation to the applicant, but also other interested parties, including staff members, who receive incentives for new business done; and dealers/agents, who earn a mark-up or commission on sales.

Whenever applicants provide information, there is a possibility of misrepresentation, no matter who is behind it. Steps should be taken to ensure that the system could not be defeated or manipulated. Lenders can: (i) implement separate fraud checks; (ii) request supporting documentation, especially for key fields; and (iii) stress characteristics that are less manipulable. For the latter, the focus put on data from automated sources, where there is no human intervention. Indeed, the combined power of credit bureau and internal transaction data is so great, that it has reduced lenders' reliance upon application forms, to the extent that risk assessments could often done without them. Unfortunately, however, there are limitations. Details obtained directly from the customer are crucial for: (i) no or thin bureau, where there is insufficient information to assess the risk properly, especially for subprime and credit-inactive groups; and (ii) large loan amounts (home loans, business loans), which demand extra input, especially where financial data is required (income, expenses, assets, and liabilities).

3.4.3.3 COMPLETE:

Data collection is like assembling a jigsaw puzzle—it is never finished until all of the pieces are in place. Unlike a jigsaw puzzle, however, it may be impossible to tell that apiece is missing, and very easy to carry on blissfully unaware. Lenders can only ensure that there is as much data available as is reasonably possible. Missing data must be minimised, which could done

at two levels: (i) characteristic, individual pieces of data are missing, such as income or occupation; and (ii) sub-record, records of existing credit facilities, or court records.

At the characteristic level, the score could suppress if key fields are missing, or if too many scored fields are missing. In contrast, if one or more non-crucial fields are missing, either they may be ignored, or meaning can be ascribed to their missingness, if

a missing field expected a 'Y/N' response it might mean 'No', or simply that that applicant would not answer. This can be determined by comparing the three categories; if the good/bad odds for 'N' and blank are close, then they should treat together.

At the sub-record level, the problem is much more difficult. The records may be missing because they were not received (associated divisions, bureau subscribers), or because of matching problems (especially if there is an incorrect or missing personal identifier). In either case, values will be unknowingly understated. If the level of missingness is constant, or improves, it forms part of the base assumptions; but if it deteriorates, the data quality could seriously compromise.

3.4.3.4   CURRENT:

When circumstances change, so does the most appropriate decision, especially in competitive environments? As a result, decision-makers need up-to-date information, whether engaged in war, business, marriage, or elsewhere. Without regular updates, data decay sets in. In credit, it can result from changes to customers' own circumstances (house move, job change, divorce, financial standing), or the data that defines them (place names, postal codes, phone codes). The update frequency will vary though, depending upon the data's acquisition cost, and benefit derived. The primary reason lenders develop complex application processing systems is because so much of the risk can be controlled at point of entry. Lenders are in a power position, because they have something applicants want; and applicants comply because they acknowledge lenders' need for information.

Once the facility is in place though, the task becomes more difficult. For existing customers, the treatment will vary depending upon the type of information. Lenders wish to minimise customer contacts, so customer supplied data should be maintained centrally, and disseminated to business units that need it. Occasional courtesy calls may then be used to update it, as necessary, if the opportunity does not arise from other customer contacts. This data changes irregularly, but when it does change, its impact can be significant. In contrast, automatically generated data, whether from credit bureaux or internal systems, will update regularly, with the frequency determined by what can be economically justified. This is especially crucial for transaction products, where this data used for on-going account management.

There is also an added complication when developing scorecards. Credit scoring is used to make future decisions, based on information available at that time. It follows, that the predictive models must base upon data that was, or would have been, available when decisions made in the past. Thus, care must be taken to ensure that the data is not too recent. A common error is to confuse outcome data with predictors, when they are provided in the same file. Fortunately, this error usually quickly identified. More problematic are instances where there is no application processing archive, and data instead sourced from a customer file or billing system, which houses customers' most recent details. If the data is relatively static or seldom updated, like occupation or education, it will not be a concern. In other instances, the data may be rendered unusable.

3.4.3.5   CONSISTENT:

Lenders' processes seldom remain static, especially in fast moving environments, where innovation and modernisation are the norm. Someone, somewhere, is always trying to improve something or other that can have unintended consequences downstream. The result is inconsistencies arising from:

3.4.3.5.1 FORMS:

Different forms could use with different questions, different layouts, or different wordings that might attract different answers.

3.4.3.5.2 SYSTEMS:

Different systems could use, with slightly different treatments in terms of processes, calculations, or who is included.

3.4.3.5.3 CONTROLS:

Different levels of rigour or different types of checks could apply (like dual capture versus programmed consistency checks).

3.4.4 DATA DESIGN:

The design of a credit scoring system must also cater for how data will be provided and stored, which imposes certain constraints when developing a scorecard. The following discussion considers several aspects of data design: data types, terms used to describe

data, both statistical and practical, and treatment of special cases; and form design, some guidelines for the design of forms used to gather data.

3.4.4.1 DATA TYPES:

In statistics, many terms used to describe data elements, usually to indicate what can and cannot be done with them. Credit scoring is a relatively specialised field though; the number of types is limited, and more labels that are straightforward are used. There are also a couple of terms relating to data manipulation that should be mentioned, being 'converted' and 'generated' characteristics.

3.4.4.1.1 CHARACTERISTICS, ATTRIBUTES, AND VARIABLES:

Data contained in company databases has two dimensions: records, which contain details for individual cases; and fields, containing individual pieces of information about each case. These equate to the rows and columns within a spreadsheet. In credit scoring, the fields more commonly referred to as either 'characteristics' or 'variables'. The two words are practically synonymous, but characteristic stresses that it contains distinguishing qualities for each record, while variable suggests their random nature. Credit scoring practitioners favour the term 'characteristic', while 'variable' is reserved for transformed inputs into the modelling process. In turn, each characteristic has possible values called attributes. For example, 'gender' is a characteristic, while 'male' and 'female' are attributes. Characteristics are of different types, the most obvious distinction being between numbers and text, each of which has different subcategories. This initially not intended as a statistics textbook, yet it is almost impossible to avoid some concepts. A characteristic can be:

3.4.4.1.2 STATISTICAL CLASSIFICATIONS

3.4.4.1.2.1 CATEGORICAL :

Groupings based on a common qualitative characteristic, such as gender (male, female), or colour (yellow, red, blue).

3.4.4.1.2.2 BINARY:

Consisting of only two possible categories, usually true/false or other opposites (also called 'dichotomous'). Most target variables in credit scoring are binary.

3.4.4.1.2.3 NOMINAL:

Distinct categories that are: (i) represented by labels (names) or codes (letters/numbers); and (ii) provide no indication of relative rank.

3.4.4.1.2.4 ORDINAL:

Indicate relative position in a sequence, but not distance from those occurring before or after, making it inappropriate for use 'as is' in calculations. It is usually associated with subjective grades, such as excellent, very good, good, fair, and poor.

3.4.4.1.2.5 NUMERICAL:

Stated as numbers, either whole or real. The relative differences have meaning, which enables their use in mathematical calculations.

3.4.4.1.2.6 CONTINUOUS:

Occurring in an unbroken series, with an infinite number of possible values, between high and low. Associated with real numbers, and especially measures such as temperature, weight, distance, and time.

3.4.4.1.2.7 DISCRETE:

Distinct and separate, or not continuous. Associated with whole numbers occurring in a sequence. Discrete numeric that are sufficiently granular are often treated as continuous.

3.4.4.1.2.8 CARDINAL:

Discrete, but specifically refers to counts within a set. Georg Cantor proposed the concept in 1873 as a part of 'set theory'. It is often considered synonymous with discrete.[1]

3.5 HISTORY AND ROLE OF CREDIT BUREAUX:

3.5.1 HISTORY OF CREDIT BUREAUX:

Borrowers with poor payment histories have incentives both to seek out new sources of credit and to withhold information about their credit histories. In the latter part of the nineteenth century, private-sector firms arose to share credit information among lenders and others who allowed subscribing to their service. These firms, known

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[1] *Above no.103, pp 255-273*

today as credit-reporting agencies, do not make credit decisions; rather, they collect, standardize, and disseminate to their subscribers information on a wide range of customer activity by individuals over time. The activity covers loans, leases, non-credit-related bills, and money-related public records such as court-ordered collections and bankruptcy. The agencies also record, and report, the requests for such information that have come from their subscribers, which include not only lenders but employers and others with a legally sanctioned interest in the information.

Credit-reporting agencies, historically referred to as "credit bureaus," were initially established by localized retail establishments and personal finance companies to share information on their customers. In 1906, the bureaus established a trade association, the Associated Credit Bureaus, Inc. (ACB), to facilitate the sharing of credit related information across the country. The membership of the ACB grew substantially, as did the number of individuals covered. However, as late as the 1960s, technological limitations restricted the coverage of even the largest credit bureaus to only a few cities.

As retail establishments sought to serve customers beyond the reach of their local outlets and as customers became more mobile, the demand intensified for the credit bureaus to efficiently obtain comprehensive information on customers in many different markets. At the same time, commercial banks, particularly those involved in regional or national credit card lending, had a growing need to gather information about prospective customers in geographically dispersed markets. Technological advances ultimately enabled the bureaus and banks to meet their needs. Those advances also encouraged consolidation among credit bureaus as the smaller entities found the costs of adopting the new technologies prohibitive.

As improved technology reduced costs and increased capabilities over the late 1970s and 1980s, the current national system of gathering and reporting credit-related information emerged. Today the credit-reporting industry is dominated by three national credit-reporting agencies, although the industry still includes a number of smaller firms with only local or regional scope.[1]

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[1]Board of Governors of the Federal Reserve System, 2007, Report to the Congress on Credit Scoring And it's Effects on the Availability and Affordability of Credit, Submitted to the Congress pursuant to section 215 of the Fair and Accurate Credit Transactions Act of 2003. Pp 13-17

3.5.1.1 EARLY TO MID-1800S:

Contrary to popular belief, formalised information sharing between credit providers was not an American innovation, but originated first in the United Kingdom both for customer and for commercial credit.

3.5.1.1.1 UNITED KINGDOM

The Mutual Communication Society of London formed in 1803, as a collaborative effort between several tailors, who compiled information on people that did not pay their bills, and published a newsletter that distributed to members. No direct link could show, but it is likely that other similar arrangements evolved, and in 1842, the London Association for the Protection of Trade formed, for a broader group of traders. At its peak, it covered 2000 merchants, covering London's West End 'carriage trade', or wealthy clients who travelled in carriages (Olegario 2002). This was renamed the United Association for the Protection of Trade in 1965, and eventually became known as UAPT Info link. It was the major competitor of CCN, and purchased by Equifax in 1994.

During the early nineteenth century, the customer credit market was tiny, but there was a lot of activity in both trade credit and financing of business ventures. Much credit extended based upon letters of recommendation, and the only way for lenders to check on potential borrowers was to hire private investigators. Barings Brothers even hired local American agents to investigate their customers across the pond, 'but this was a costly arrangement [limited] to the very largest firms' (Olegario 2002). Co-operative arrangements evolved, one of which was the Manchester Guardian Society in 1827. It collated business information and financial reports at a time when the industrial revolution was gaining force, and the British Empire was growing rapidly. It operated under the same name for 157 years, until it bought by CCN in 1984.

3.5.1.1.2 UNITED STATES OF AMERICA:

The expansion of the American economy during the mid-1800s brought a credit boom. According to Olegario (2002), some merchants' associations formed, but these were limited in their geographical coverage, and focused on trade creditors as opposed to customers. One of the first was a group of 1820s New York wholesalers who hired an investigator, but the arrangement was short-lived. Credit reporting agencies were first formed during the 1830s, and 'were better suited to the peculiar needs of American

society, where [customers' business dealings] were frequently dispersed over a wide area'. Most operated on a hub and spoke system, which was well suited to the task. One of these was the Mercantile Agency, a New York based company founded by Lewis Tappan (1788–1873) in 1841, towards the end of a worldwide depression, and during a year when bankruptcy legislation implemented.

The Mercantile office remained New York bound until Benjamin Douglass, a clerk who also married Tappan's granddaughter, took it over in 1849. Douglass took advantage of transportation and communication improvements to expand. He hired credit reporters who gained sound business skills, and over a 10-year period set up a network of 2,000 correspondents to provide information about businesses around the United States, that published in a 'Reference Book'. Many of the correspondents were local attorneys, who in exchange received referrals for collections work. Four of them went on to become American presidents (Lincoln, Grant, Cleveland, and McKinley).

The Mercantile Agency incorporated as R.G. Dun & Company in 1859, after Douglass turned it over to Robert Graham Dun, Tappan's grandson and his brother-in-law. Competition with Bradstreet was fierce, and in an 1861 advertisement, Dun claimed that their ratings were predictive. The growth of the market indicates that these ratings had significant value in the eyes of their customers, even if more analysis that is recent shows limited value. By the 1850s, Dun had 2,000 correspondents throughout the United States and Canada. The number of companies reported on grew from 1859— 20K; 1870—430K; 1880—764K; 1890—1.176M; and 1900—1.285M. In like fashion, by the 1870s, the subscriber base had grown to 7,000, and 10 years later, it was at 40,000. The reference book published quarterly from 1873. At the same time, John M. Bradstreet Company also continued to grow.

3.5.1.2   1890S ONWARDS—CUSTOMER:

It took a lot longer for customer credit reporting agencies to catch on in the United States, the first being Retailers Commercial Agency(RCA) of Brooklyn, New York, in 1869. It was many years later though, that they started proliferating. The Credit Clearing House established in 1888, and was effectively the first successful national wholesalers' association. In 1897, James Chilton formed the Chilton Corp. in Dallas, Texas, and collected information from merchants on shoppers' payment habits, in a notebook he called his 'Red Book' (the Chilton Corp. was purchased by TRW in 1989).

Later, in 1899, Cator and Guy Woolford in Atlanta, Georgia formed the Retail Credit Company (RCC). RCC purchased RCA in 1934, and in 1975, it changed its name to Equifax.

During the first half of the twentieth century, the number of American credit bureaux increased phenomenally, but these almost always focussed upon a specific industry and geographic area. The National Federation of Retail Credit Agencies thus formed on 24 February 1906, to promote sharing across these barriers, and grew rapidly. Membership was less than 100 bureaux in 1916, but grew to 800 by 1927, and 1600 by 1955 (Staten and Cate 2004).

Most of the credit bureaux in 1919 represented retailers, who at the time provided 80 per cent of customer credit. This was largely because usury legislation prevented other lenders from competing with retailers, who were disguising their finance charges in the prices charged for goods sold on credit. In 1916, many states had relaxed their usury laws, which brought banks and finance companies into the market some of whom were offering revolving credit.

Over time, the retailers' share of customer credit reduced from 1919's 80 per cent, to 67, 40, and 5 per cent in 1929, 1941, and 2000 respectively. In spite of the reductions, retailers were still able to benefit from the 1920s explosion in instalment credit demand for customer durables. This accompanied by a surge in the number of credit bureaux, and the onset of the depression did not kill the trend. The Michigan Merchants Co. formed in 1932, which later became Credit Data Corporation (purchased by TRW in 1969).

This is not to say that all was smooth sailing during the depression. The competition between R.G. Dun and John M. Bradstreet in the trade creditor's market was been fierce, and the depression caused Dun's CEO—Arthur Whiteside—to broker a merger between the two companies, to form Dun and Bradstreet (D&B) in 1933.

3.5.1.3   1960s ONWARDS

The American post-war boom saw further growth of customer credit reporting. Little had changed in the prior 40 or so years though: they were still small community-based companies, or co-operatives, that served a specific type of lender—bank, finance company, or retailer—and they would provide information over the phone on

delinquencies and defaults. The agencies would also comb through newspapers for 'notices on arrests, promotions, marriages, and deaths', and include them in people's files.

These practices continued through the 1960s, and by 1969 there were 2,200 credit bureaux in the United States, collecting data from public records and 400,000 creditors that maintained files on 1.1 million customers. Advances in computing technology during the 1960s led to the automation of countless labour-intensive back-office functions. This extended to credit bureaux and aided industry consolidation, which brought the number of credit bureaux down to about 200 by 2005, in spite of continuing credit growth. Credit Data Corporation was the first to automate in 1966.

Trans Union founded in 1968, as the holding company of the Union Tank Car Company (UTCC). One of its business areas was business intelligence, and it sensed broader opportunities in credit reporting. In 1969, it diversified by taking over the Credit Bureau of Cook County, which at the time had 3.6 million card files in 400 seven-drawer cupboards.

Credit bureaux in the United States were largely unregulated, prior to the passing of the Fair Credit Reporting Act in 1970, which according to Cate et al. (2003) 'was a notably even-handed attempt to balance the need for accessible credit data, with customers' concerns about privacy'. This set of ground rules aided both consolidation and growth within the industry, and by the late 1970s, Trans Union and Equifax had emerged as leaders. They later joined by TRW (today's Experian) to form the 'big three'.

TRW (Thompson Ramo Woolridge) first entered the credit reporting industry in 1968, when it purchased Credit Data Corp., and renamed it TRW Credit Data. Its focus was customer credit, and in 1989,it purchased Chilton Corp. In 1976, TRW's IS&S division collaborated with the National Association of Credit Managers, to create its first business credit report. The division grew by acquisition into direct marketing/target marketing, and real-estate information and loan services.

The CCN was formed in Nottingham, England in 1980, when GUS split off its information services division—which had been supporting a mail-order operation, in existence since 1900. By 1982, they were already offering a credit bureau service (CAIS—Credit Account Information Sharing), and their credit scoring capabilities were

obtained with the purchase of MDS in the United States that same year. In 1984, they expanded their bureau operations through the purchase of the Manchester Guardian Society.

In 1996, as a part of a drive to focus on core businesses, TRW divested all of its credit reporting interests into a new company, called Experian. It immediately purchased by GUS, and merged with CCN under the Experian name, to enhance brand recognition, and stop ongoing confusion with CNN, the television news service. Prior to 1996, CCN already established in a variety of countries, including a small office in the United States, but this allowed them a much larger footprint, as one of the American 'big three'.

By the early 1980s technology had already evolved to such an extent that credit bureau were able to provide subscribers with more accurate information electronically, than over the phone. They had transformed themselves from paper-based local associations serving specific industries, to high-tech companies serving the broader economy.

3.5.1.4   INTERNATIONAL:

At the turn of the twentieth century, credit-reporting agencies also been established in other countries outside the United States and the United Kingdom. For example, in 1901, D&B established an office in Cape Town, South Africa, to provide information on local traders to suppliers in the United States. Over time, other agencies established around

South Africa, some as the initiatives of local chambers of commerce (as in Durban, Kroonstad, and East London), but almost all of these were acquired by D&B during the 1970s and 1980s. D&B divested in 1986, in a management buyout that saw the local operations renamed Information Trust Corporation (ITC). It was sold to M-Net in 1990, and then to Trans Union in 1993. D&B returned and took a minority stake in 1994. The company was renamed Trans Union ITC in 2002, and dropped ITC from the name in 2006.

The late 1920s saw the establishment of the first private credit bureau on the European continent. Schufa Holding Agwas formed in 1927 by a group of banks and retailers, and is today the largest bureau in Germany. The Union Professionnelle du Credit (UPC)

formed in Belgium during the 1930s, *the Consorzio per la tutela Del credito* (CTC) in Italy in 1964, and the Bureau *Krediet Registratiein* the Netherlands in 1965.

The depression saw the *Deutsche Bundes* bank establish the first ever-public credit registry (PCR) in 1934, as a response to the systemic risks highlighted by the depression. Today the German *Evidenzzentralefür* Million *enkredite* only covers loans larger than €1.5 million. Other public credit registries were established in: 1946 France, Service Central *des Risques*; 1950 Chile, *Archivo Deudas Generales*; 1951 Turkey; 1961 Finland; 1962 Italy, *CentraledeiRischi*; 1962 Spain, Central de *Información de Riesgos*; 1964 Burundi; 1964 Mexico, *Servicio Nacional de Información de Crédito*; 1966 Jordan; 1967 Belgium; and 1968 Peru, *Central de Riesgo*. The number of countries with credit bureaux has continued to grow, and in 2005, there were over 50 countries with private credit bureaux, over 70 countries with public credit registries, and 20 countries with both.[1]

3.5.2 THE ROLE OF CREDIT BUREAUX:

Credit bureaux (or credit reference agencies) well established in the U.S. and the U.K. In other countries in Western Europe and in the major developed countries, they are in varying stages of development. Eastern Europe, for example, has only recently begun to tackle the issue of how to develop them. Where they are well established, they are state owned or there is a small number of very large players in the market, in the U.S., there are currently three major bureaus, while the U.K. has two.

To understand the role of credit bureaus, we can examine how they are arisen. Prior to their widespread use, when one considered a lending application, one might write to an employer or a bank for a reference. Certainly, in the U.K., these references became more guarded and less useful. In addition, if bank Ours, for example, became aware that Mr. Brown is applying to bank other for a credit card or a mortgage, before replying to the reference, bank Ours could offer him one of its credit cards or mortgage packages. Of course, the bank reference would reveal only, at best, details of performance of the bank account, a general indication of the prospective borrower's character, and any adverse information of which the bank or the branch at which Mr. Brown banked was aware. As credit availability expanded, bad debts began to appear. What was galling

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[1]*Above no.103, pp 4451.*

was that these bad debts were easily avoidable as indications that they could occur were available at the time of the application.

Before describing how credit bureaus operate in these two nations, we should recognize the very different position that U.S. and U.K. credit bureaus occupy. A principal piece of legislation governing credit bureaus in the U.K. is the data protection Act. In the U.S., one of the key pieces of legislation is the freedom of information Act. Therefore, the two regimes start from opposite ends of a spectrum. In very rough terms, in the U.S., information is available unless there is a good reason to restrict it. In addition, in very rough terms, in U.K., information is restricted or protected unless there is a good reason to make it available. Thus, U.S. credit bureaus have a greater wealth of information on customers.

In both environments, the credit reference agencies first began to accumulate publicly available information and put it in a central point. Even in the 1980s, this might achieved with a large room full of index card cabinets. On receipt of an inquiry, an agent would the inquirer on hold and run up and down the room accessing relevant cards. Obviously, over time, this becomes computerized. This means that a human operator dialling up the inquiry service or, more commonly, two computers talking to each other can also make the inquiry electronically. This public information on public court debts. Using the computing power, the bureaus are also able to link address so that, when a customer moves house, the debt and the customer do not become detached.

The bureaus also act as agents for the lenders. Lenders contribute to the bureau details of the current status of their borrower's accounts. These statuses can view and used by other lenders when considering a credit application. They can also view and used by other lenders in marketing although with some increased greater restrictions on the use of the data. (In U.K., this agency arrangements works for the lenders on a reciprocal basis. Roughly speaking, if the lender contributes only details on their defaulting customers, they get to see only details on other lender's defaulting customers).

Another service that bureaus offer is to accumulate details of all inquiries and try to assess mismatches and potential fraudulent applications. Clearly, the greater the level of detail with which to work, the better. Major bureaus also offer a variety of application processing services.

A further service used by many lenders is a generic score. This score calculated from a scorecard built by the bureau based on its experience with millions of applications and millions of credit history records. It is particularly useful in cases where the lenders are not large enough to develop scorecards for their own portfolios or in the early year or two of a new product. It is also used to get an up to date view of the borrower's credit position as it will incorporate the borrower's recent credit performance with all contributing lenders and any inquiries being made as a result of fresh credit applications. Indeed, some lenders, especially in credit card portfolios, by a score for each of their cardholders every month and use these to assess how to deal with cases which miss payments or go over limit, or when and by how much to increase the customer's credit limit.[1]

A credit bureau collects information from a range of data sources and provides its customers with valuable credit information, which enables them to make better decisions. The collected data can include general information about individuals and companies, ranging from industry codes, home addresses, board membership, and financial data regarding negative and positive payment information and additional economic details.

In developing countries, lending is in large measure made possible by national credit bureaus, which perform the crucial function of gathering and distributing reliable credit information. The credit bureau collects data from a variety of sources on corporate entities or individuals, consolidates it into credit financial and non-financial institutions, as well as supervisory authorities.

Reports from credit bureaus contain information about the payment behaviour of customers and commercial entities, including data on timely fulfilment of or delinquency in financial obligations. Credit officers of banks and credit organizations use this information to help decide whether to approve an application for accredit facility and what interest rates to apply. Other uses of credit information include economic analysis and systematic risk evaluation by banking regulators on supervised financial institutions.

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[1]*Above no.108, pp 15-16*

Market structures can enhanced by having credit bureaus or information exchange platforms in terms of facilitating data sharing, credit granting, and application processing. They can also help to improve in 5 key areas:

- ❖ Over-indebtedness,
- ❖ Credit Risk,
- ❖ Identification and Fraud Prevention,
- ❖ Banking supervision,
- ❖ Implementation of Basel III.

3.5.2.1 OVER-INDEBTEDNESS:

Over-indebtedness more efficiently dealt with by credit bureaus than organisations acting independently. Bureaus have access to historic data, which traces past loans and forms the basis for future decisions. In addition to information from both financial and various non-financial organisations, credit bureaus can also consolidate information from different government registers to verify an individual's salary and gain details on existing loans. This helps to assess the likelihood of repayment for outstanding or future loans.

3.5.2.2 CREDIT RISK:

A credit bureau can identify credit risk by observing a worsening payment history. If the payments are overdue, this can recognise and the decision to issue any further loans can consider with this information in mind. This serves as an advanced warning of potential payment problems ahead. It can also gather information to calculate a credit "score" for the debtor or credit applicant and the risk of default, which reflect the relative risks and gauges the likelihood of repayment. As the credit information becomes more complex, it is difficult for one individual to assess the information given. The credit bureau can deal with numerous data items, in order to compute an accurate score.

3.5.2.3 IDENTIFICATION AND FRAUD PREVENTION:

Another function of a credit bureau is to identify and avoid fraud. Since credit bureaus have access to an extensive database of customers, they can cross-reference

personal details to make sure loans have not taken out in different names when it is actually the same person, or a group working in collusion.[1]

3.5.2.4   BANKING SUPERVISION:

Bank supervisors around the world typically adopt risk-based approaches to bank supervision. Supervision focuses on assessing banks particular vulnerabilities and the likelihood of failing, while at the same time taking into consideration their systemic importance when budgeting the time and resources devoted to their monitoring. The information contained in PCRs can used to enhance those risk-based supervisory practices. When bank supervisors have detailed data of bank loans, they can depict a more accurate risk profile of bank loan portfolios and perform more efficiently and effectively the two dimensions of the supervisory framework: the regular off-site monitoring and the less frequent on-site inspections.

According to survey data collected by the World Bank between 1999 and 2001, 20 of the 34 central banks or bank superintendence that had a PCR (of near 60 surveyed), 33 indicated that PCR data information is used for bank supervision, mainly to determine the total indebtedness of borrowers across the system. The PCR data also helped supervisors to revise, and when necessary rectify, the classification that financial institutions assign to their borrowers. PCR data also help to evaluate the sufficiency of provisions for problem loans, to identify lending trends and to flag banks that had significantly increased their exposure to riskier credits. Also, 31 authorities indicated that PCR data were reviewed on a periodic basis as a complement to off-site monitoring and prior to on-site inspections.

3.5.2.4.1 ON-SITE INSPECTIONS:

The on-site supervision is a time-tested tool to monitor and assess banks solvency and resilience. The results of on-site supervisions usually translated into a rating. For example, initiated by the US supervisors and now also used in other countries, 21the CAMELS rating system yields a composite rating of an institution's overall condition and performance by assessing six components: capital adequacy, asset quality, management quality, earnings, liquidity, and sensitivity to market risk. Asset evaluation is of paramount importance: it measures to what extent the financial

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[1] *World Bank Group, (2011), General Principles for Credit Reporting - consultative report. Washington, DC: World Bank.*

institutions are exposed to credit risk, usually the most important driver of bank losses which is present in the trading book (e.g. in OTC credit derivatives) but most prominently in the loan portfolio (broadly defined, including off-balance sheet exposures). These examinations can streamline using the information in PCRs.

The assessment of loan portfolio quality usually based on samples of borrowers. It is not feasible that supervisors conduct a one-by-one review of every credit, particularly when dealing with large banks. Although samples of credits can obtain from the banks themselves, they can also produce with PCR data. By knowing beforehand the number and amount of credits that each bank has granted by type of borrower, type of credit and risk rating at the minimum, samples can be customized and supervisory efforts better allocated. Samples may stratified to ensure representativeness of the banks' activity in the geographic regions, business sectors, and type of product in which they are active, or tailored to those segments that merit scrutiny during the visit. For example, for borrowers whose credit quality has deteriorated banks' largest obligors and connected borrowers could merit a more thorough review. When PCRs register individualized credit operations, they can produce samples to evaluate how new credit policies or financial products are influencing the bank's risk profile, and if this is consistent with their credit strategy.

For prudential purposes, in many countries regulatory frameworks set a criteria or mandatory rating system that banks must use to risk classify their borrowers and to compute loan loss provisions. Increasingly, though, they are allowing banks to use their own rating systems for those purposes. At times, they require these particular banks to map their grades into a single and homogeneous scale that allows performance comparisons across banks. In either case, during on-site inspections bank supervisors examine the reliability and robustness of banks' risk rating processes and systems and, in particular, whether they are underestimating default risk. Banks' portfolio samples obtained from PCRs should look for inconsistencies or abnormalities in rating systems or rogue credit policies. For example, they should flag and track refinanced/restructured credits to monitor their payment behaviour. It is also helpful that samples cross check risk ratings assigned by different banks to the same borrower: significant and systematic differences should be deem abnormal and should trigger the necessity for further revisions.

3.5.2.4.2 OFF-SITE MONITORING:

Bank on-site examinations can be highly demanding in time and resources for both the supervisor and the inspected institution, and consequently conducted at periodically timed intervals. Off-site monitoring procedures are thus an efficient aid for an effective on-going supervision, allowing supervisors to monitor banks and observe how their risk profile evolves between inspections, with the possibility to promptly identify changes in their financial condition.

Besides its usefulness for conducting on-site supervision, PCR data can support continuous off-site bank monitoring. PCRs databases can be programmed to produce regular, timely supervisory reports (for internal use) containing key risk indicators that summarize banks' exposure to credit risk. At the minimum, they should characterize the overall quality of a bank's portfolio and of its various segments, depicting with particular detail the risk profile of the largest borrowers. These reports can also measure bank exposure to concentration risk by type of borrower, region, business sector, credit type, etc. It is important that they indicate the extent of connected lending and verify banks' compliance with prudential regulation for borrower risk classification. This can accomplish by comparing the rating for the same borrower in different banks or computing transition matrices to benchmark the deterioration of a bank's portfolio relative to other banks.

In recent years, bank supervisors have been modernizing their toolboxes for assessing banks' financial performance and risk profile, adapting diverse credit-risk management methods that had introduced or developed by the banking industry. This has allowed them to in still a quantitative approach to their off-site monitoring, with techniques that can summarize large amounts of data into a few quantitative assessments. Although the reliance on databases is not a perfect substitution for onsite supervision, the process for off-site monitoring has particularly been facilitated by those jurisdictions that utilize the PCR to produce more reliable and useful estimations of bank risk; for example, those that use PCRs in techniques, such as risk assessment and early warning systems, credit portfolio models and stress tests, and need detailed data on banks credits.

❖ SUPERVISORY RISK ASSESSMENT AND EARLY WARNING SYSTEMS:

Based largely on the experience with credit scoring models and rating systems by the banking industry, supervisors developed their own systems to quantify and rank banks' performance in general, and to measure their loan portfolio quality in particular. In a review of the supervisory approaches for bank monitoring in G10 countries, *Sahajwala and Van den Bergh* (2000) grouped the diverse systems into four categories: supervisory bank rating systems, financial ratio and peer group analysis systems, comprehensive bank risk assessment systems and statistical models. To the extent that credit risk is the major driver of bank losses, the ability to count with detailed PCR data enhances the quality of these systems and the reliability of their assessments. For example, the off-site rating system used at the Bank of Italy (the PATROL rating system) measures credit quality and loan concentration with PCR data.

❖ BANK PORTFOLIO CREDIT RISK:

When monitoring banks and assessing their capacity to withstand losses for credit risk, the adequacy of their provisions and capital levels can be evaluated by means of transition matrices and portfolio credit risk models (Credit Risk +Internal Ratings Based approach - IRB -, etc.) that incorporate PCR data. Transition matrices are useful devices to analyse the dynamics of portfolio credit risk – they show how borrowers risk grading has evolved in the past, what their average default rate has been, and how far it has deviated from that average (its volatility). Portfolio models also exploit historical credit data, but are more efficient in that they had better depict loan portfolio loss distributions. Either way, these techniques can provide insight as to banks' ability to withstand expected and unexpected losses. They are of particular importance in those jurisdictions that have yet to adopt risk-based capital and provisioning requirements for credit risk.

❖ STRESS TESTS:

Although banks (in particular, large and/or internationally active ones) perform stress tests as part of their credit risk management policies, central banks and bank supervisors are increasingly performing their own stress testing exercises .These supervisory stress tests are designed to gauge the capacity of banks to

undergo an extreme, but plausible, financial stress event. With respects to credit risk, in general banks losses are modelled as a function of bank specific (types of credit, loan portfolio quality and concentration, etc.) and macroeconomic variables (GDP growth, unemployment, etc.) behaving in accordance with the agreed scenario, which may be deterministic (historical or subjective) or stochastic (typically, derived by Monte Carlo). Regardless of how the scenarios are assembled, the effect on banks' loan portfolio quality can be obtained with a top-down analysis, directing the impact of the shock to the bank portfolio as a whole, or bottom-up, assessing the effect on each market segment or business line and aggregating the results across the bank. The latter type of analysis is much more precise and detailed, and therefore requires a rich set of data. Much of this necessary information normally collected by PCRs as part of their normal operational business procedure. Detailed PCR data can also allow supervisors to perform a precise analysis tracing the impact on banks largest borrowers, who typically account for a large share of their assets and thus may have systemic relevance. In all these cases, detailed loan data will allow bank supervisors to better model the impact on banks portfolios of the shock as well as banks' capacity to remain solvent.

These and other off-site techniques require detailed credit information of banks' loan portfolio to evaluate their underlying risk. Although some of these data may obtained from the bank themselves by means of regulatory reports or from the latest on-site report, PCRs usually contain updated data of practically all borrowers in the loan portfolio and consequently outperform other sources of information.

3.5.2.5   IMPLEMENTATION OF BASEL III:

Published in 1988, the former Basel I Accord became obsolete as the banking industry developed new financial products to circumvent its capital requirements. Most sophisticated larger banks had gone through a rapid evolution of their risk management. Financial innovations had found mechanisms to evade or arbitrage away the Basel I capital standard, mainly through securitizations, masking the true riskiness of the bank. Therefore, there was an increasing debate as to whether institutions adequately capitalized given the nature and extent of the risks they exposed to. With this knowledge, the Basel Committee on Bank Supervision issued in 2006 the Revised International Capital Framework (Basel II), attempting to better align bank capital

requirements to economic risk by associating more precise estimates of risks. However, in hindsight, Basel II was ill equipped to handle the new financial products that emerged during Basel II's implementation stage namely CDOs, re-securitizations and securitization liquidity facilities, all of which indirectly led to the 2008 crisis.

The new International Regulatory Framework for Banks (Basel III) is the response engineered by the BCBS to avoid the repeat of a similar crisis in the future. Basel III builds on a refurbished Basel II enhanced in July 2009 with amendments to its three pillars, which complemented with bold reforms, including: a global liquidity standard, a framework for neutralizing externalities imposed by SIFIs and a countercyclical capital framework.

Basel III will impose challenges to regulators and supervisors. This is even relevant to those that are not Basel Committee member countries and will not adopt it, such as the case with host supervisors of banks whose home supervisor adopts Basel III. It represents a change to traditional supervision techniques. In addition to the ordinary on-site and off-site supervisory processes, under Pillar 2 supervisors are responsible for revising banks validation of their internal rating systems and their assessment of their risk profile and capital adequacy.[1]

3.6 CREDIT BUREAUX CHARACTERISTICS:

Credit reference agencies or credit bureaus exits many countries. Their roles are not identical from country to country, and neither are the legislative frameworks in which they operate, therefore, it should come as no surprise that the stored and available data vary from country to country and even within countries.

In this section, we shall describe in some detail what is available from credit bureaus. This is to give some appreciation of the extent of the information that collected, analyzed, and made available.

There are too many bureaus for customer information like (Experian and Equifax). Information accessed through name and address, although there different levels of these

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[1]*Matías Gutiérrez and Jane Hwang, 2010, Public Credit Registries as a Tool for Bank Regulation and Supervision, The World Bank Latin America and the Caribbean Region Finance & Private Sector Unit, Policy Study Working Paper 5489*

being matched. The information they have available on customers falls into several types, and we deal with each one in turn:

- ❖ Publicly available information,
- ❖ Previous searches,
- ❖ Shared contributed information- through closed user groups, many lenders share information on the performance of their customers,
- ❖ Aggregate information- based on their collected information, such as data at post code level,
- ❖ Fraud warnings,
- ❖ Bureau-added value.

3.6.1 PUBLICLY AVAILABLE INFORMATION:

Publicly available information is of two types. The first is the electoral roll or voter's roll. This is a list of all residents who have registered t vote. This is not a complete list of all adults since there is no requirement to vote, as there is in some other countries. This information also includes the year in which someone registered to vote at an address. This is useful information because it can used to validate the time that someone has stated that they have lived at an address.

There is a debate between the office of the data protection registrar (ODPR) and the regulatory and industry bodies. This debate has arisen because the ODPR wishes voters to be able to decide whether their voter registration should be available to use for credit or marketing purposes. It looks like that some constrains will be implemented. However, while this is being done to provide greater protection for the customer, it is possible that the effect will be to weaken the lender's ability to distinguish between acceptable and unacceptable credit risks. If so, either the customer may actually suffer by been declined or by being forced to pay more interest rates to cover the additional risks.

There is no legal obligation on local councils to provide the electoral roll to the bureau. The electoral roll is available on paper to political agents with regard to an election and is often available for inspection in local libraries of council offices. However, in almost all cases, the electoral roll supplied to the bureaus electronically in return for a considerable fee.

The second type of public information is public court information. These are the details of country court judgments (CCJs) or, court decrees. One option as part of the process to pursue a debt is to go to a county court and raise an action for a CCJ. This establishes the debt and may force the debtor into action. If the debtor then clears the debt and this information passed to the bureau, the CCJ does not disappear but will show as having been satisfied. Similarly, if there is a dispute concerning the CCJ, which proved in favor of the plaintiff, the CCJ may show have been correct. This may occur, for example, where the court action rose for a joint debt when the liabilities of one of the debtors had extinguished.

3.6.2 PREVIOUS SEARCHES:

When a lender makes an inquiry of a credit reference agency, that inquiry is recorded on the customer's file. (There are special circumstances when it not recorded). When another lender makes a subsequent inquiry, a record of any previous searches will be visible. The previous searches carry a date and details of the type of organization that carried it out (bank, insurance company, credit card Company, utilities, and mail order).

What is does not reveal is the outcome of the inquiry. Therefore, a customer may have eight searches recorded over a two-week period by a number of companies. We cannot tell which of these are associated with offers from the lenders and in which cases the lender declined the application. For those cases where an offer made, we cannot tell if the applicant accepted the offer. For example, the customer could be simply shopping around several lenders for the best deal but will take out only one loan. On the other hand, the customer could be moving house and inquiries are to support financing the purchase of furniture. A further possibility is that the customer is desperately short of money and is applying for a variety of loans or credit cards and intends to take everything that he can get.

Therefore, while the number and pattern of previous searches may be of interest, either in subjective assessment or in a scorecard, it requires carful interpretation. In scorecard development, the characteristics that might be included would be the number of searches in the last 3-month, 12-months, and 24-months, as well as the time since the last inquiry. Obviously, with the likely correlation structure, it would be very rare that more than one of these would appear in a final scorecard.

3.6.3 SHARED CONTRIBUTED INFORMATION:

Many years ago, both lenders and bureaus realized that there was value in sharing information on how customers perform on their accounts. Therefore, at its simplest, several lenders can contribute details of the current performance of their personal loans. If a customer applies for a personal loan and they currently have one with one of the contributors, an inquiry at the bureau will provide details of whether their existing loan is up-to-date or in arrears and some brief details of the historical payment performance.

This developed in many ways but the fundamental guidelines encapsulated in a document to which lenders and the bureaus subscribe-the principles of reciprocity. One gets to see only the same type of information that one contributes. Some lenders contribute data on only some of their products, and they should see details of other lender's contributions only for the same products. Some lenders do not provide details on all their accounts. Rather, they provide details only of their accounts that have progressed beyond a certain stage in the collections process, usually the issue of a default notice.

When a lender carries out an inquiry, it will not be able discover with which company the existing facilitates and products are, however, it does get to see details of the type of product-revolving credit, mail order, and credit card.

3.6.4 AGGREGATE INFORMATION:

Through having data from the electoral roll and having the contributed records from many lenders, the bureaus are in an advantageous position to create new measures that might be of use in credit assessment, with the depth of the information supplied by lenders, together with the electoral roll and the post office records, they do create variables at a postcode level.

Clearly, the individual lender cannot see this information in its entirety as the search is indexed by the address that is entered. However, the bureaus are able to create such measures that, in some scoring developments, prove to be of value. Also, as the ODPR tries to restrict recording and use of data pertaining to the individual, this type of information may be able to restore the lender's ability to discriminate between good and bad credit risk.

3.6.5 FRAUD WARNING:

The bureaus are able to record and store incidences of fraud against addresses. These could either be first-party fraud, where the perpetrator lives at the address quoted, or impersonation fraud, where the perpetrator claims that they live at the address quoted.

A credit reference inquiry carried out at the address may generate some sort of fraud warning. This does not mean that the application is fraudulent. Most lenders will use this as a trigger to be more careful and perhaps increase the level of checking that carried out on the details supplied. In fact, many cases that generate a fraud warning are genuine applications; the warning having resulted from an attempted impersonation fraud. It would be counter to common sense, to business sense, and to the guidelines to which the U.K. industry adheres to assume that a fraud warning means the application in fraudulent. While the warning may make the lender more cautious, the lender should decline the case as a fraudulent application only if it has proof that there is some aspect of fraud involved. One cannot decline a case as fraudulent simply because another lender has evidence of an attempted fraud.

3.6.6 BUREAU-ADDED VALUE:

As could seen from the above discussion, the credit bureau store huge amounts of information. Using this, they are able to create and calculate measures. However, they can also develop generic scorecards. Their construction is along the lines a standard scorecard. There is a huge volume of data and a definition of bad taken. These scorecards do not relate to a specific lender's experience. Neither do they relate to the lender's market position. They also do not relate to specific products. Further, the bad definition may not be appropriate for a specific situation. However, they can be extremely useful in at least three environments.

The first environment is where the lender is too small to be able to build its own scorecard. To allow it some of the benefits of scoring, the lender calibrates its own experience against the generic scorecard. This will allow it to build some confidence of how the scorecard will operate and to set a cut-off appropriate to its needs.

The second environment is when there is a new product. In such cases, a generic scorecard may be of use even for larger lenders since there would be insufficient information on which to build a customized scorecard for that product.

The third environment is in general operation. While the lender may have a scorecard that discriminate powerfully between good and bad cases, a generic scorecard allows the lender to do at least two things. The first thing is that the generic scorecard may add to the power of the lender's own scorecard as the generic scorecard will be able to reveal if an applicant is having difficulties with other lenders. The second thing, therefore, is that the generic scorecard can used to calibrate the quality of applications the lender receives.[1]

3.7 CREDIT BUREAU OPERATIONS:

The purpose of the Credit Bureau is to amass and maintain, and then make available, pursuant to contracts with customers, all pertinent credit related information, including demographic data, pertaining to all companies and people. With that end in mind, there are numerous daily operational functions that are identical with any other business, anywhere. Credit bureaus undertake the following functions:

3.7.1 DATA COLLECTION:

The collection and "layering" of both demographic and credit data is the most important component in the creation of a database. The entire credit bureau concept centres on the collection, storage, and dissemination of credit- related payment history and demographic information. The information contained in the active trade references been reported will be current and normally updated at least once every 30 days. Different clients will report the data in different formats, different time cycles, and in "information bundles" containing different data. In Ukraine, this will be especially true in the non - banking sectors. A process will developed to gather the data from direct lenders, standardize the information, translate the information, and store it appropriately in the database.

The cornerstone of the data collection process will be a "data acquisition" module described in detail in the technical section of this report. This module will be custom built to accept electronic transmissions, upload information from external media, and

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[1]*Above no2, pp 126-131*

permit manual entry of data from the data- contributing customers of the credit bureau. The credit bureau will translate all of the information submitted by new customers into a uniform and consistent format to upload into the database. After the initial upload, a monthly update to the information will conduct, through the same module, to keep the information current. The monthly transmissions of data will all retained for indicating historical payment performance as well as information verification in the dispute process. The construction of this part of t he database program will be the most complex and time consuming due to the logic that must be used to properly accumulate, sort, accept, and store the data.

The module will built in the formation stages of the credit bureau, but the data collection process will continue on a daily basis.

There are two primary functions in the data collection process that will performed by staff members of the credit bureau. The first is the routine technical maintenance (e.g. trouble - shooting, user assistance, and program monitoring) to be carried out by a "program technician (s)," which will be a full time staff member (s). The second is the manual data entry function to handle by a "credit administrator," who will also be a full time staff member.

Credit registry data collected from every commercial borrower in the banking system. The data contain identification information on borrower and lender, and may include details such as name, location, and industry and ownership information. Information on location, industry, and ownership is particularly useful for testing if credit is concentrated in certain regions, industries, or groups of companies and whether such trends have strengthened over time. A typical credit registry records both positive and negative credit information. Positive credit information includes total amount of credit issued, credit outstanding, maturity, and collateral value (if any). Negative credit information includes default rate (broken by 30-day, 60-day, etc.), recovery in case of default, and any legal actions against the borrower in the past. In certain countries, there may be a sunset provision on negative information such that negative information automatically deleted from the record after a pre-determined number of years. It is common for credit registry data to update on a monthly basis. With the advancements in

information technology, collecting credit registry data at a monthly frequency is not too cumbersome.[1]

3.7.2 DATA MAINTENANCE:

The control and manipulation of the data contained in the credit bureau's database is the most time consuming and labour intensive function in the entire scope of operations. The accuracy, integrity, and relevance of the data dictate the value of the core product (the credit profile) offered to the customer base and are the central focus of all of the other office functions. A full time staff person, whose primary duty is to record, validate, process, and handle relations with customers and data subjects, will administer the data maintenance function,. Proper maintenance will help to make possible prompt and efficient service.

An in - house operating program, or "maintenance module," will be written to allow user interface from the credit administration staff of the credit bureau. This program will allow administrative text changes to make to the data been kept by the credit bureau. The program will also have an adequate internal security system to ensure that only authorized users are able to access the database.

3.7.3 CUSTOMER RELATIONS:

An integral part of the day-to-day operational functions of the credit bureau is the customer relations component. Customer relations applies to individual subjects (either companies or individuals Ukrainian s) of credit profiles. The customer relations function would include the following duties:

❖ Answering questions for subjects of credit profiles,
❖ Instructing subjects of credit profiles and existing customers about how to proceed in cases of disputed or inaccurate information,
❖ Studying disputes between lenders and subjects of credit profiles,
❖ Amending or supplementing trade line information, when appropriate.

The data "maintenance module", for Ukraine is detailed in the technical section as well. The customer service reps will have "read only" access-the system must design to show their access with internal notes on files.

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[1]*Atif Mian, 2012, The Case For A Credit Registry, www.nber.org/chapters/c12553.pdf*

Communication between the credit profile subjects and the customer service staff of the credit bureau is critical to a properly functioning credit bureau. The education of the entire lending community is the most labour- intensive part of the entire operation, so it is essential that staffing resources be allocated in a manner in which the cost versus benefit ratio is maximized. "Boiler plate" letters and responses will develop to cover the most common questions and sources of dispute.

3.7.4 CREDIT PROFILE GENERATION:

The credit data contained in the database is also the end product, when properly arranged into a preformatted report. The data will be sent back to the customers in a standard, easy to read format agreed upon by the management of the credit bureau and the technology experts.

There are two distinct steps in the generation of credit profiles. The first is the actual querying function of the database. This function selects the information from the database, pertaining to a specific subject, and consolidates it into a unique reporting of all pertinent credit data existing in the subject's file. The primary sorting criteria will be the identification number field, followed by the name field.

The second step of the profile- generation process is the actual delivery of the credit profile to the customer. Just as there will be numerous ways in which data be collected, there will also exist a number of ways to return the final product to the customers of the credit bureau. The most efficient method will be secure electronic transmission.

The "credit administrators" will be responsible for contact with the customer base regarding the "manual" generation and the delivery of the credit profiles. Since the most predominant method of delivery will be "automatic," the "program technician" will be responsible for overseeing the operation of the connections between the customers and the credit bureau. The automatic deliveries should be seamless to the customers, so it is imperative that the connections between the customers and the database carefully monitored and kept in technologically sound condition.

3.7.5 SOFTWARE AND HARDWARE MAINTENANCE:

Technical analysts will be the backbone of the software system's operational efficiency. There should be two staff members, initially, to administer to the network and the custom-built software application used to contain the data. The staff members

should be local residents of Ukraine so they are aware of and proficient in the use of local technological and communications tools, and are familiar with available "IT" resources. They will be cross- trained and possess an intimate knowledge of the database and all other maintenance and transfer modules. Ideally, they should be involved in the creation of the program to be use by the credit bureau. Their duties will include the following:

- ❖ Technical assistance to all components of the hardware and network equipment of the company,
- ❖ Technical assistance to all components of the software program used in data manipulation,
- ❖ Supervision of all uploads and data transfers to and from customers,
- ❖ Assist in new product development and enhancements of existing credit bureau products,
- ❖ Trouble shooting for inner- office purposes,
- ❖ Installation and on - site instruction for customers of the credit bureau,
- ❖ Needs assessment and recommendations for potential customers,
- ❖ Trouble shooting and customer support f or existing customers.

3.7.6 COMPLIANCE:

The credit bureau will be the first entity of its kind in Ukraine. Management will ensure the following:

- ❖ Legal statutes are adhered to when establishing both internal and external policies and procedures,
- ❖ All policies and procedures are adhered to,
- ❖ Internal audits conducted to ensure the compliance to policies by the staff.

The compliance function will be an internally controlled operation. The general manager of the bureau will regulate the function. A regular schedule and program will established, at least on a quarterly basis, to check that:

- ❖ Customers have permissible purposes to inquire into credit files,
- ❖ Customers have authorized signatures to inquire into credit files,
- ❖ Authorized users (customers) of automated technology are properly licensed,
- ❖ Credit bureau staff is following proper procedures in investigating, correcting, and amending credit profiles,

❖ Borrower inquiries or disputes been handled appropriately.

3.7.7ADDITIONAL AUDIT FUNCTION:

While it is impossible to audit each individual item of data that provided to the credit bureau, to ensure it placed in the correct file, there are tests that could complete to verify the accuracy of placement. Logic for the placement of information in files must develop with a small tolerance. A set of audit criteria should develop and perhaps, 80% (as example) of the criteria should meet before an item placed on a file. The criteria would probably include name, address, and date of birth, passport, and other relevant demographic information, for trade line information been placed in a file for the first time. Subsequent placements of that trade line would then include the proprietary account number of the trade line, with the data provider. If the tolerance percentage is not met then the trade item would be rejected and placed in a 'reject database' for individual review by a credit bureau staff member.

In accordance with the Law, the public can look at their own credit files. This is in fact a type of second audit. Individuals who view their personal files conduct a second audit. The Credit Bureau would:

❖ Provide prompt access to the Credit Bureau system in an efficient and low cost manner,

❖ Provide access, to individuals, who wish to view t heir own credit files and to provide a mechanism by which these individuals are able to dispute incorrect information that may be present in their file,

❖ Hire and retain knowledgeable staff in order to develop the confidence of the public that their disputes will be dealt with in an efficient manner, within a reasonable time frame, and that corrections will be promptly made,

❖ Provide educational awareness programs for Credit Bureau users and the public at large.

3.7.8 POLICIES AND PROCEDURES:

The Credit Bureau must adhere to policies and procedures regarding access by anyone to the database. To accomplish this, a "Standard Operating Procedures" manual must be prepared and published covering all of the daily and routine functions (in both data manipulation and all other office functions) and procedures. It must design to anticipate as many potential circumstances as possible.

3.7.9 PUBLIC RECORD INVESTIGATION:

Tracking and storing public record data may require employing some credit investigators because not all data is in automated form or centralized. With respect to court records, there is no uniform reporting method in Ukraine so the Credit Bureau must devise its own investigation and collection procedures. In these cases, the basic operational format would be to employ "credit investigators". They can, depending on priorities, visit, personally, locations where certain types of public record information housed. Although civil judgments and liens are not entirely centralized, records exist in some of the major cities.[1]

3.8 PUBLIC VERSUS PRIVATE CREDIT BUREAUS:

Access to finance is a major challenge, especially in emerging and developing economies. A key factor behind the persistence of this problem is the information asymmetry between lenders and borrowers that encourages adverse selection and moral hazard. To address this information asymmetry, credit registries and bureaus have been established around the world to serve as information brokers. The reduction of information asymmetry has positive implications for relaxing credit constraints, increasing competition in the credit market and the efficient allocation of capital.

The two main kinds of institutions for collecting and sharing information on credit transactions are private credit bureaus (PCBs) and public credit registries (PCRs). PCBs are usually created by the private sector, while the PCRs are largely public institutions. This distinction is important. PCBs are likely to be created due to demand in the market for reliable credit information on borrowers. As such, their presence in an economy is in response to demand by lenders where the benefits from sharing credit transaction data exceeds the gains to relying solely on the information rent specific to one lender. PCRs, on the other hand, are usually public institutions created with the main goal of supervising the banking sector. This is particularly relevant when assessing their effects in Africa. For the countries in the monetary unions in West and Central Africa, the PCRs are located at the regional central banks. So while lenders can use the information collected by PCRs to better assess the credit-worthiness of borrowers, this is a by-product rather than the main motivation for their creation.

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[1] *Access to Credit Initiative Project USAID/Ukraine, 2005, CREDIT BUREAU BUSINESS PLAN UKRAINE, pp 48-53*

Another key difference between the two institutions is that participation of banks in sharing information with PCRs is compulsory. This is not the case with PCBs, though some African governments require financial institutions to share information with PCBs. On the other hand, the coverage offered by PCBs is likely to be more comprehensive than PCRs because while the latter focuses only on supervised financial institutions, the former can include information on credit transactions by institutions as diverse as retailers and utilities. It is also worth pointing out that the design and regulation of individual PCBs and PCRs across African countries can be very different, which can influence the degree to which these institutions serve as information brokers in the credit market.[1]

3.8.1 PUBLIC CREDIT BUREAUS:

Public credit registries (PCRs) the world over share a basic framework, in terms of their institutional arrangements, the type of data which is collected and typical policies regarding distribution of credit data to participating financial institutions. Most PCRs are operated by the Central Bank or Bank Supervisor and financial institutions they supervise are compelled to participate by means of a law or resolution. As a result, the greatest source of data for most PCRs is the commercial banking sector. Institutions are required to report on a regular basis, typically monthly, and usually on both their commercial and customer borrowers. In most cases, information is requested on borrowers regardless of their standing–not only negative data is collected on late payments or defaults, but also positive information on credit exposure in good or normal conditions. This information is used as part of the supervision process, as well as distributed back to the financial institutions that provided the data. Access to data is typically limited, based on the concept of reciprocity, so only institutions that provide data have access, and they are seldom charged. In response to confidentiality concerns from reporting institutions, the total credit exposure for a borrower is often aggregated, and the names of the lending institutions are omitted, before being distributed. In many countries, the PCR data functions as a kind of negative list or enforcement device, since data on defaults or late payments are erased once they have been paid. Also, many nations only distribute current data, such as data for the previous month, so the PCR does not offer a historical record on a borrower's credit behaviour.

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[1]*ThourayaTriki and OusmanGajigo, 2012, Credit Bureaus and Registries and Access to Finance: New Evidence from 42 African Countries, African Development Bank Group, working paper no.154*

Although PCRs share many common characteristics as described above, there are also important differences, especially relating to the specifics of information that is collected and the rules on distribution and disclosure. Based on our survey results, these differences are not surprising, as countries have tended to develop their public credit registries independently, with no direct input from PCRs existing in other countries. Moreover, even in Western Europe where public credit registries have the longest tradition and regularly meet in a formal EU Working Group, there remain significant differences between the models followed by France, Germany, Italy and Spain. Tables in the Appendix to this paper present detailed results of the survey of public credit registries, providing for the first time an opportunity for an in - depth international comparison and analysis of this policy.[1]

PCRs are registers operated by Central Banks or other supervisory authorities, which collect credit information about borrowers to make it available to reporting institutions as an input into their credit decisions and for other purposes linked to their legally recognized role. Some PCRs were initially set up for banking supervisory functions and in particular, for monitoring financial risks. Nowadays, however, the majority of European PCRs also provide credit reports to creditors and customers (on their own situation), as part of their daily operations. These registers may store data above a certain minimum amount, which may differ significantly from country to country.

The sharing of credit information is in the public interest from a financial stability and supervisory perspective. That is why, in many countries, regulations entrust to a public authority (generally the one in charge of banking supervision) the task of organising the collection and distribution of credit data through a public credit register.

Contribution to the PCR's database is compulsory by virtue of national law. Regulations define the institutions that are obliged to contribute data (the so-called 'reporting institutions'), the type of borrowers that must be reported, and the information that must be provided. Mandatory reporting allows a very high coverage of the credit market above a certain threshold. The authority in charge of a PCR is generally endowed with enforcement powers which can be used to obtain the correction of inaccuracies or the communication of missing data. Failure to comply can result in sanctions.

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[1]*Margaret Miller, 2000, credit reporting systems around the globe: the state of the art in public and private credit registries, World Bank*

The information provided by creditors can be controlled by means of on-site inspections (provided for by law or regulations), logical-statistical checks or cross-checks with other information provided by creditors to the supervisory authority, as well as through customer complaints.

Most PCRs typically focus on collecting corporate and customer's credit data. They collect credit information on the type of loan and their characteristics, such as, maturity, currency, guarantees... but exclude information from non-financial sectors, such as telecoms, utilities, retail businesses, etc. PCRs do not generally provide additional services to creditors, such as credit scoring or portfolio monitoring.

3.8.2 PRIVATE CREDIT BUREAUS:

Private Credit Bureaus (CBs) are privately owned and can have a number of ownership structures that can be summarised as follows:

- ❖ CBs in which creditors and/or other services to providers are either majority or minority shareholders;
- ❖ CBs owned and operated by specialized firms with no ownership by creditors;
- ❖ CBs formed on the basis of associations.

CBs collect credit information from different types of creditors. CBs activities can be summarised in the following way:

- ❖ CBs receive information from creditors and/or public sources (courts, public registers, tax authorities, etc) and then merge the data;
- ❖ CBs analyse and interpret the data for a quality control;
- ❖ CBs provide this data and/or a credit report to creditors;
- ❖ CBs provide additional services (e.g. fraud prevention, credit scoring).

Creditors can obtain a flow of data about a credit applicant by requesting a credit report from the CB. Creditors which provide data to CBs are granted access to the common database insofar as the data provided is timely and accurate. CBs, as well as PCRs, do not participate in the decision as to whether granting or not granting credit to a borrower, this totally remains in the creditor's hands given they hold the risk.

Most CBs operate for profit. Since CBs earnings are generally proportional to the number of reports issued, and the number of reports increases with the number of

creditors included in the CB, they generally have an incentive to have as many creditors as possible as clients.

CBs offer, depending on the national laws, their services to a large number of actors (banks, financial institutions, credit card companies, customer credit companies, leasing companies, utilities providers, telecom providers, etc.). As additional services to their clients, CBs can issue several sorts of credit reports, depending on the information gathered, the type of credit application (customer credit, mortgage credit, business loan, credit card, etc.) and, most importantly, the amount of detail requested by the creditor. Reports range from simple statements of past defaults or arrears ('negative' data) to detailed reports on the applicant's assets and liabilities, guarantees, debt maturity structure, pattern of repayments, etc ('positive' data); within the limits of respective national provisions on data protection. Annex 6 provides an overview of these additional services per country. Some CBs also use statistical models to produce and sell 'credit scoring' services which are usually based on the whole credit bureau dataset or on a representative sample of the data. Scoring models are also developed by the financial institutions themselves, or third-party providers. The type and structure of the information that they can provide to non-creditors differs between countries, and in some instances is regulated by domestic law.

3.8.3 PCRS AND CBS: SIMILARITIES AND DIVERGENCES:

The compulsory nature of PCRs data contribution means that 100 % of the population that receives credit is covered, sometimes above a minimum amount (threshold) determined by law. CBs, usually, have a lower threshold. They collect and manage more detailed information and often from more varied sources within the given legal framework. However, the fact that reporting is voluntary can imply a lower coverage of the credit market.

PCRs and CBs are based on the principle of reciprocity, which generally lies at the core of any credit reporting system. This principle means that members of a credit register can obtain credit information only if they provide credit information to it. As mentioned above, although data contribution to PCRs is mandatory by law for creditors, data contribution (based on the principle of reciprocity) to a CB is one of the key features of the contract.

Creditors supply information to the credit register on their credit relations. They update the information either instantly or with a frequency set by the credit register and are obliged to correct the delivered information in case they should find that the information provided is wrong and/or outdated. Creditors have to assure the quality and accuracy of the data. The borrower has the right to access, update, review and correct his/her personal data. By accessing his/her data, borrowers contribute to its accuracy. The main features of PCRs and CBs are summarised in Table 3.2.[1]

Table 3.2 : Main features of Credit Bureaus and Public Credit Registers

	Private Credit bureau	Public credit bureau
Ownership structure	Private/commercial entity	Central bank or supervisory authority
Clients structure	Mainly creditors but sometimes also other services providers	Financial institutions authorised to grant credit
Scope	Credit assessment and monitoring	▪ Banking supervision, building statistics, financial stability studies. ▪ Monitoring and preventing over-indebtedness. ▪ Credit assessment. ▪ Forecasting credit institutions prudent management.
Creditors' participation	General voluntary	Mandatory by law
Principle of reciprocity/Non discriminatory access	Yes	Yes
Type of data stored	▪ Full credit data (positive and negative data). ▪ Often also non-credit data	▪ Credit data from financial institutions authorised to grant credit (including both positive and negative data in majority of cases). ▪ Data on bankruptcy of natural and legal persons.

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[1] *Above no.49*

Additional services provided to creditors	Mainly: ▪ Credit scoring based on the whole CB dataset. ▪ Software applications. ▪ Portfolio management services. ▪ Fraud prevention systems. ▪ Authentication products...	None
Use of thresholds	Yes, but generally low	Yes
Degree of detail of the information provided	Detailed information on each individual loan. In some countries, credit information merged with other data (e.g. from public sources).	Information sometimes in consolidated form (giving the total loan exposure of each borrower). In some PCRs, the information is also given in a detailed from.
Coverage	Depends on the legislation, length of service provided, financial culture, etc	Universal coverage

Source: Elizabeth Mays, 2001, handbook of credit scoring, Fitzroy Dearborn publisher, USA, P21.

3.9 CHAPTER SUMMARY:

This chapter has provided an overview of the broader theoretical aspects of credit scoring and credit bureaux , including what motivates its use, where it fits, how it has affected lending, and how the public benefits. The lending of money is something that requires trust and, as in any instance where two parties contract, there is the potential for adverse selection (making the wrong choice), and moral hazard (change of behaviour once the deal is done). Lenders often rely on collateral, and guarantees, to enhance that trust, but improvements in data and automation have shifted the focus onto information. Information asymmetries (differences in information) that give borrowers an advantage over lenders will always exist, but this advantage can reduced by accessing data from outside sources. Service charges will also be reduced, as banks then have less scope to earn information rents (extra benefit that can be obtained by exploiting information not available to competitors), but this is offset by increased volumes. It also allows borrowers greater flexibility to move between lenders, and geographically.

Today scoring is an accepted, stable, and accurate technology. There already exist many successful applications of scoring technology throughout the credit life cycle. These applications have led to a simpler, more consistent, unbiased, faster, and more accurate decision-making process. As we mentioned through this chapter, an important thing to remember is that there is always a better way – the next generation of scoring applications expected to lead to a new credit process, not merely an optimization of the current one.

CHAPTER IV

IMPLEMENTATION OF CREDIT SCORING WITHIN THESUDANESE-BANKING SECTOR

4.1 INTRODUCTION:

Sudanese banks have witnessed a considerable shift in recent years towards its loans and advances by focussing on customer credit. The traditional method of evaluating applicants that based on judgmental system is increasingly becoming inappropriate for the large volume of applicants. Because of the shift in the lending market and the increased emphasis placed by the regulator on risk management, Sudanese banks have to rethinking on the way they assess their applicants for credit.

Traditionally, the credit decision whether to accept/reject an applicant has based on the subjective evaluation of the credit application forms and supporting documents. The literature advocates on objective approach on the lines of credit scoring which is fast, reliable, consistent, and risk-based. On the strengths of this argument, this chapter presents the qualitative and quantitative considerations including issues relating to data capture, model development, and the implementation of a formal credit-scoring model within the Sudanese banking sector.

4.2 AN OVERVIEW OF THE SUDANESE BANKING SECTOR:

The Sudanese banking sector has witness a considerable change in favour of loans and advances during the last 5 years. Commercial and industrial lending (also known as corporate lending) which was the sole source of revenue earnings for the banks has taken a back seat as a result of the economic slowdown, infrastructural constraints and disintermediation. Over a period, banks have realised that in order to avoid the concentration risk, they need to expand into other lending avenues, which has paved the way for "customer lending."

From the start of the new millennium, Sudanese banks have started to extend credit to the common person in the form of "customer credit." This has become a new paradigm in Sudanese banking sector and it includes a comprehensive range of financial services and products such as home loans (mortgages), auto loans, educational loans, and personal loans.

With the growth in customer credit, emphasis is also been placed to develop a prudent credit decision. Within the Sudanese banking sector, the credit decision making is a two way process. Firstly, the credit assistant or the credit supervisor prepares a credit

proposal or credit document based upon the applicant's application form and supporting documents. Thereafter, the credit decision is made by the credit officer/manager (based upon his lending authority) scrutinizes the credit proposal using subjective or judgmental evaluation supported by basic financial analysis.

Subsequently, in 2005, the central bank of Sudan has emphasized the need for Sudanese banks to adopt prudent risk management systems and the importance for risk based supervision as per the Basel II guidelines. One of the implications for the risk-based approach is that Sudanese banks would have adopted a risk-based credit decision-makingframework, which would be objective and consistent.

Further, the present study would explore the existence and application of customer credit risk management systems in Sudanese banking sector against the background of the wider use of credit scoring for gaining risk, process, and cost-benefits across the customer credit portfolio. The main outcome of this thesis will be the development of an empirical "customer credit scoring model" which could be applied for customer credit evaluation in the Sudanese banking sector.

In comparison with Sudanese 'small and undeveloped economic base, the Sudanese banking system is much diversified with a number of banks operating in a governmental as well as nongovernmental manner. There are four state-owned banks namely "Industrial Development Bank, Sudanese Agricultural Bank, Saving and Social Development Bank and Elnelain Bank". Also there are Twenty-five joint Banks namely "National Bank of Sudan, Workers National Bank, Sudanese Islamic Bank, Mashreq Blue Nile Bank, Beblius Bank, Bank of Khartoum, Animal Resources Bank, Baraka Bank, Farmers Commercial Bank, Nile Bank, Tadamon Islamic Bank, Faisal Islamic Bank, Alroad Bank,Alshamal Islamic Bank, Export Development Bank, real estate commercial Bank, financial Investment Bank, Omdurman National Bank, Al Salam Bank, Sudanese Egyptian Bank, United Capital Bank, Al Jazeera Sudanese Jordanian Bank, Family Bank, Saudi Sudanese Bank and Sudanese French Bank". There are also eight foreign banks namely "Qatar Islamic Bank, Abu Dhabi Islamic Bank, National Bank of Egypt, National Bank of Abu Dhabi, Qatar National Bank, African Bank for Trade and Development, Arab Bank and Ivory Bank."

Over the last 5 years, the Sudanese banking sector has witnessed a positive shift in terms of performance, growth, and development, as following:

Table 4.1: Sudanese economic and banking system growth:

Growth rates (in Per cent)	2010	2011	2012	2013	2014
GDP	6.30	-3.30	-10.10	- 6.0	2.60
Banking sector	3.10	3.00	2.90	2.80	5.40
Credit	14.70	13.40	29.40	19.50	16.90

Sources: Economic and Financial Statistics Review, Central Bank of Sudan, issue: 4, volume: 51, December 2013&World Bank Group, 2015, global economic prospects report.

Figure No (4.1): Sudanese economic and banking system growth rates:

	2010	2011	2012	2013	2014
GDP	6.30	-3.30	-10.10	-6.00	2.60
Banking Sector	3.10	3.00	2.90	2.80	5.40
Credit	14.70	13.40	29.40	19.50	16.90

The growth rate of the gross domestic product (GDP) has witnessed a constant and considerable discrepancy from 6.30% in 2010 to (-6.00%) in 2013, then its go up sharply in 2014 to reach 2.60%. While the growth rate of the banking sector increased significantly between 2010 and 2014, at the same time there was a fluctuation in the growth rate of credit of commercial banks in local currency between 14.70% in 2010 and 16.90% in 2014.

Table 4.2: Sudanese banking highlights:

Indicators	2010	2011	2012	2013	2014
Capital Funds	6,042,990	6,950,799	8,312,196	10,178,489	11,091,011
Deposits	26,608,495	29,526,178	44,093,112	50,346,671	58,303,686
Total assets	41,615,441	46,495,841	68,727,835	74,472,097	92,880,440
Total Credit	25,379,979	28,768,836	37,224,699	44,498,215	52,061,884
Total NPLs	3,574,310	3,619,768	5,548,320	4,162,450	4,128,416
Profit from credits	1,232,184	2,026,134	2,244,934	2,938,017	4,118,307
Profit/loss	1,601,291	1,933,964	3,052,453	3,013,002	3,736,504

(Source: Central Bank of Sudan, banking soundness statistics reports, 2010-2014).

Figure no 4.2 : Sudanese commercial banks credit Profits
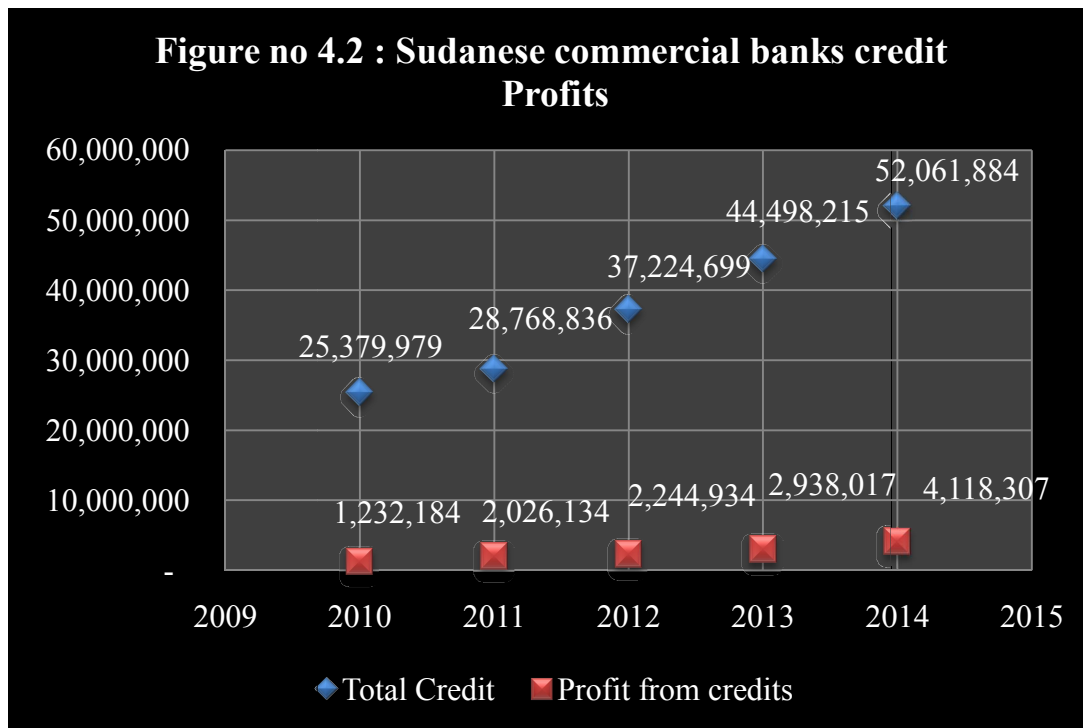
(Source: Developed for this study).

Figure no 4.3 : credit profits / total credit

- 2010: 4.85
- 2011: 7.04
- 2012: 6.03
- 2013: 6.60
- 2014: 7.91
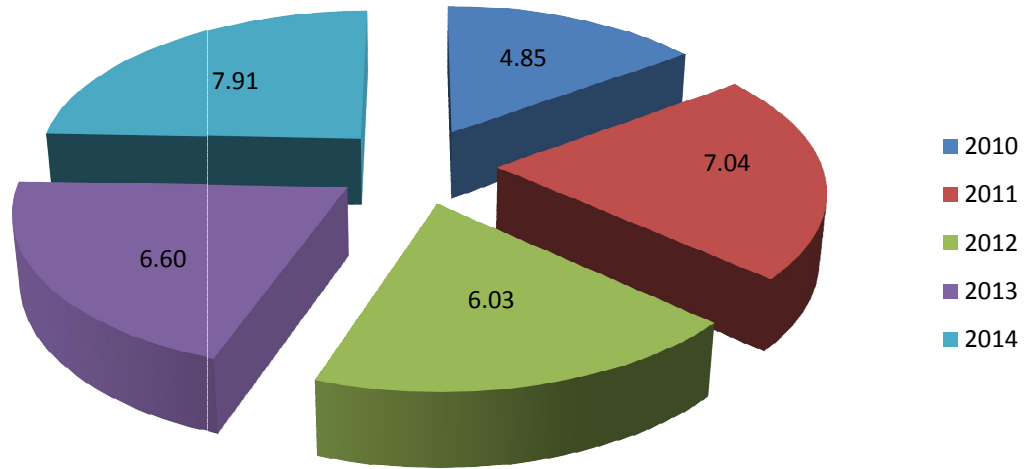
(Source: Developed for this study).

Figure no 4.4 Total credit and NPLs

Year	Total Credit	Total NPLs
2010	25,379,979	3,574,310
2011	28,768,836	3,619,768
2012	37,224,699	5,548,320
2013	44,498,215	4,162,450
2014	52,061,884	4,128,416
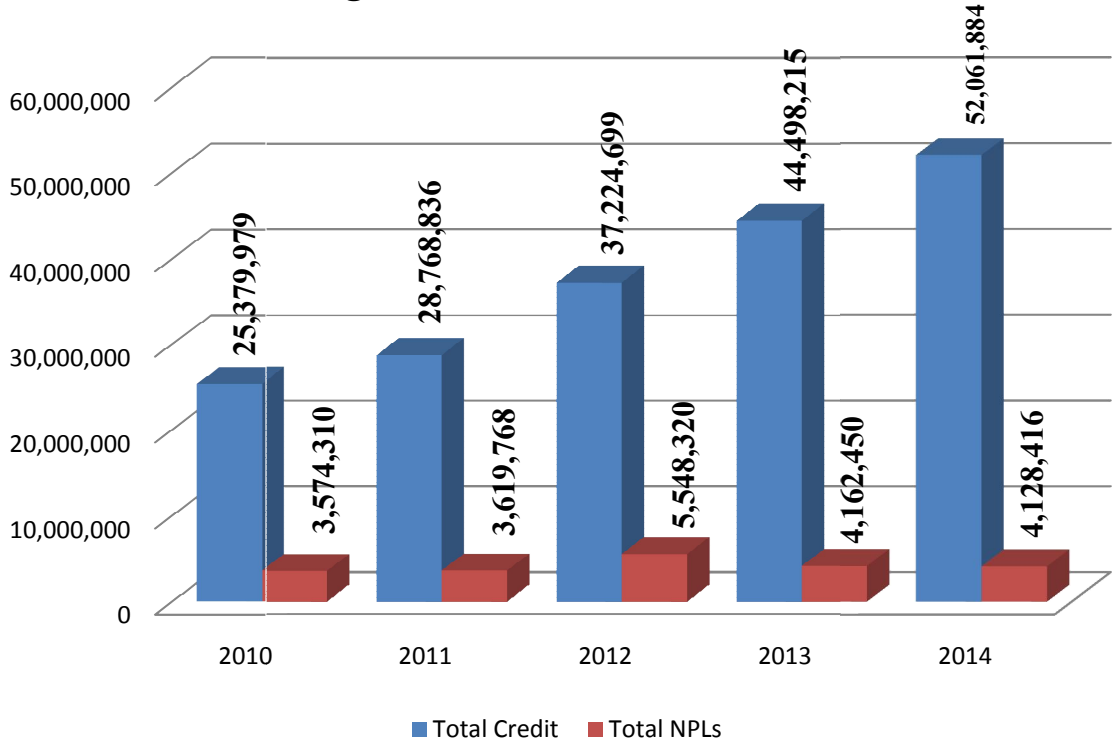
(Source: Developed for this study).

In conjunction with the growth in the number of banking sector, there has been also significant improvement in the financial highlights as presented in table 4.2 in December 2014, the profit of the banking sector reached to Sudanese pounds (SDG) 3,736,504 from 1,601,291 in December 2010 which shows a growth of 53.3%, That resulted from total credit of banks which was rise dramatically between 2010 and 2014 from 25,379,979 SDG to 52,061,884 SDG.

Table 4.3: Soundness Indicators of Sudanese commercial Banks (in per cent):

Indicators	2010	2011	2012	2013	2014
Credit/Deposit	95.38	97.44	84.42	88.38	89.29
Credit/ Assets	60.98	61.87	53.52	55.02	56.05
Credit/GDP	11.96	10.81	12.02	10.44	11.25
Capital/Total Deposit	22.71	23.54	18.85	20.22	19.02
Capital/Total Credit	23.81	22.81	22.33	22.87	21.30
Capital/Total Assets	14.52	14.95	11.95	12.58	11.94
NPLs/Total Credit	14.08	12.58	14.90	9.35	7.93
NPLs /Total Assets	8.59	7.79	8.07	5.59	4.44

(Source: Central Bank of Sudan, banking soundness statistics reports, 2010-2014).

Figure no 4.5: NPLs/Total Credit
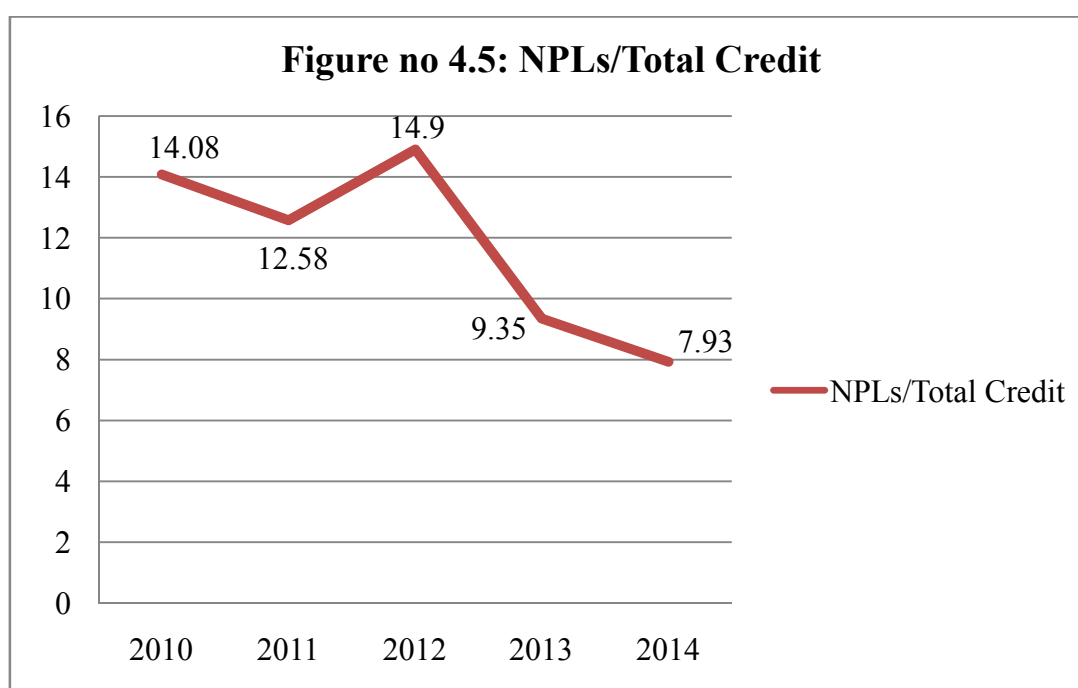
(Source: Developed for this study).

In December 2010, the proportion of Non-Performing loan (NPLs) to the total credit of the commercial banks stood at 14.08 per cent. However, over the period from 2010 to 2014, the NPLs have shown a steady decline to 7.93per cent in December 2014. I believe that it has consequently increased profits and Capital funds of commercial banks in particular and has a positive impact on commercial banks performance in general.

4.3 THE CENTRAL BANK OF SUDAN CREDIT REGISTRY :

Public credit information registries and other types of credit reporting firms are critical elements of the institutional framework necessary to support a well-functioning and modern financial system. They allow for the broadening of the reach of the financial system to include greater numbers of a country's population. The credit information that a Central Bank can provide to banks, and in the broader sense the credit reports that can be provided to the market place by credit reporting agencies, are becoming increasingly important throughout the world, fuelled by demand for the data they contain from banks and other financial intermediaries as well as by demand from private firms, retailers, employers, landlords and others. Bank supervisors and regulators are also increasing their demand for high-quality credit data to more effectively monitor credit risks in supervised financial institutions. Basel II encourages this more effective monitoring of credit risk.

Study shows a strong relationship between the extent of credit reporting in an economy and private credit to Gross Domestic Product. Credit reporting systems allow credit grantors the opportunity to extend credit to qualified individuals and Small and Medium Enterprises (SME) based on an analysis of their credit standing, past and present, with accurate and reliable information. The result is lower borrowing costs for customers and lower write-offs and lower credit investigation costs for loan providers. The beneficiaries of such improvements are the general population. The most effective public and private credit registries contain both positive and negative credit information to allow for recognition of those who their credit responsibilities as they build 'reputation collateral' and those who do not honour their obligations. The CBOSCR contains both positive and negative information.

Credit application investigation costs are reduced given the comprehensiveness and depth of data contained in the credit registry, and credit grantors have less concern about credit applicant's failure to disclose indebtedness by having a central database to check and learn of other debts. As a result, the percentage of the population that enjoy access to credit, in countries that have a credit reporting registry, is much greater than countries that do not have these registries.

The registry was formed in 1996 and until 2005, all information was maintained in hard copy. Construction of the database commenced in 2005 and became operational, with information been made available to banks, electronically, in December 2006. The primary purpose of the registry was to provide Sudanese banks with credit data, relative to current borrowers, to allow banks to make more precise and better-informed credit decisions. The registry maintained within the CBOS Banking Regulation and Development Department (BRDD). Since the implementation in January 2009 of the code number to identify borrowers, and the requirement for banks to provide expanded demographic data to the registry.

Conceptually, via Circular No. 8 that issued in 1996, the credit registry commenced. The Circular was entitled 'Commencement of work with the credit risks program relative to the Banking Finance Programs'. According to CBOS officials, this circular is the foundation, and authorization, for the creation of the CBOSCR. The registry has evolved from a manual, hard copy database to the current automated database that is accessible via dial up on real-time basis. In best practice, banking law would include a provision that authorizes the creation of the public registry, which is currently not the case in Sudan. However, there is the Credit Inquiry and Scoring Agency Draft Act for the Year 2011, under consideration, that would authorize the creation of a private registry to own by the Central Bank of Sudan and Sudan Ministry of Finance. Given the CBOS position that they plan to establish and operate this registry, the opinion of CBOS officials is that no amendment needed. It anticipated this Draft Act has passed by the Sudan Parliament by July 31, 2011.

The purpose of the registry was to provide commercial banks with information on existing Sudanese borrowers, to allow their credit adjudication process to be more precise and informed as it relates to the indebtedness of credit applicants along with the character of those borrowers as evidenced by their paying habits. This effort initiated by

the CBOS.

Commencing in 1996, banks could request information, in writing, from the registry. On January 1, 2001 it was mandated that banks must request information on all credits of 100,000 SDG ($50,000 USD) or greater. The requests continued to make in writing. In 2006, the registry automated and its data made available to banks in December 2006, in an automated format. At the same time, banks were able to request credit reports via automated means.

In January 2009, the CBOS mandated that all bank borrowers must assign a borrower code by the CBOS. The assignment of the code included banks providing expanded demographic identifying data on all credits extended following the mandate. Banks also requested to obtain borrower codes on those existing borrowers, where banks have the required expanded demographic identifying data in their databases.

4.3.1 CBOS CREDIT REGISTRY CHARACTERISTICS:

A. Banks are required to report all outstanding credits, on a monthly basis,no later than the 15th of each month;

B. Originally, banks submitted their lists of credit accounts electronically, via 'dial up' lines, and CBOS Registry staff updates the database after some quality control checks are completed. A VPN has been in place since August 2010 and the VPN allows all banks to transmit their data in a more efficient and secure manner;

C. All 33 banks in Sudan report all their proprietary credits to the BOSCR;

D. Both positive and negative information is being reported, by banks;

E. Sudanese banks are mandated to complete an inquiry search on all credit applications (in August 2008 the previous standard of mandatory inquiry searches on applications of 100,000 SDG or more ($50,000 USD) was changed to include all applications);

F. Banks had automated access to the BOSCR via a 'dial up' connection, twenty-four hours per day, and six days per week. Since August 2010, the 'dial up' has replaced by a VPN, which allows for more reliable, efficient and fast response access. The 'dial up' has disconnected.

G. Banks report data to the BOS on accounts that have closed, due to issuance of returned checks, and this information maintained in the database. It previously maintained in hard copy. This data will be available for search inquiries when the credit registry upgrade is completed;

H. The BOS maintains a 'blacklist' of bankrupt borrowers. This information housed in the BOSCR database. Since the June 2008 mission, this information is now included as a component of the search function;

I. When credits paid in full, they deleted from the BOSCR database, even credits that were past due when the full balance was paid. This problem will be corrected, and paid credits will be maintained in the database, once the registry upgrade is completed and replacement BOSCR database software is installed;

J. Bad debt accounts not purged from the database. Instead, they are archived;

K. Date of inquiry searches are displayed on each borrower's credit file;

L. New credits extended, and accounts closed due to returned checks, are reported to the BOS credit registry within two business days of either activity;

M. Successful inquiry searches yield a credit report that contains the borrower's name, individual credit balances and the payment status of each credit (either outstanding or in default);

N. All borrowers and guarantors are assigned unique borrower code numbers;

O. In 2009, expanded borrower demographic identifying data was added to the CBOSCR database;

P. Activity was concluded in August 2010 that saw expanded financial data added to a test database for entry to the CBOSCR database when the new software has been installed in the CBOSCR database;

Q. The CBOS has a disaster recovery plan.[156]

156Jim Aziz, Middle East Regional Technical Assistance Centre, In consultation with the IMF Monetary and Capital Markets Department, Support to the bank of Sudan credit registry June 2008-july 2011

4.4 CBOS CREDIT CODING PROJECT:

For the purpose of the credit information system, to solve the problems of information asymmetries. The central bank of Sudan started to prepare the coding project for banks' in 2008 by making coding formats for clients and to train employers in the central bank of Sudan and commercial banks. Above all the central bank of Sudan has established on Oct.21.2008 on electric information code office with members from all commercial banks for supervising the returns.

4.4.1 OBJECTIVES OF CREDIT CODING:

The project of the credit coding for clients has done to achieve many objectives:

A. To keep a network database about all the clients in the banking system.
B. To develop electronic information process about all clients in the banking system.
C. Give a credit code to each client considered as a unique code to help in differentiation between the similar names.

4.4.2 CREDIT CODE:

Demographic information format has designed to relate the clients and its group with banks and financial corporations and these formats have divided into four groups:

    A. Customers and individuals information.
    B. Company information.
    C. Organization information.
    D. Connect the client with the credit group.

The customer awarded a credit code (CBOSID) after giving the demographic information represented in:

    A. Full name.
    B. Mother's name.
    C. Wife's name.
    D. Nationality number.
    E. Address.
    F. The national number.

G. Bank identities number.

Company and organization should be given a credit code after giving:

(1)Full name.

(2)Registration number.

(3)Address.

Direction has been issued by the central bank of Sudan on Jan. 4th 2009 declared that no finance or credit facilities should not be given to any customer who do not complete his demographic information needed. Banks continue to want the credit code for the customers with letters attached with documents until Oct. 15th 2011 unless there are some problems in commercial banks. In the input process for the data. This problem could solve through central bank of Sudan and the credit information and scoring agency through manual matching.[157]

4.5 CBOS CREDIT INFORMATION AND SCORING PROGRAM:

Based on the credit coding process for the banks customers and with a technical help from the Middle East Centre (METAC), the central bank of Sudan started to develop banking credit registration system to achieve many objectives:

A. To increase the code and quality of the information collected.

B. To offer a credit code for each customer in banks and financial corporations.

C. To develop credit reports to cope better practices.

D. To develop administration and supervision over the reports to cope with better practices and to prepare a credit and information program through which strategic partner should select represented in Credit Info Company in 2010. Also the credit information and scoring law has been issued in Aug.2010 that organizes this operation and how to collect information and data and make a new network data.

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[157]*Mohamed AbdallaElhassan, Developing Risk Management of credit and financing in Sudanese banks and financial corporation (2003-2012), Credit Information and Scoring Agency, Publication No "6", July 2012.*

From the central bank of Sudan and the other institution supervised general records about the customers. In 2011 the credit information and scoring agency has established to provide a credit information service besides exchanging data and information with foreign Agencies.

It obviously observed that the central Sudan bank has issued a number of policies and regulation to develop risks management in banks and financial corporations. This can easily be done through developing credit and information about customers in banks starting from the mind scape gateway to credit information and scoring system.

4.5.1 THE FUNCTIONS OF CREDIT INFORMATION AND SCORING AGENCY:

Credit scoring and information law has issued in 2011 and in the third articles to establish this agency to achieve many aims:

A. Prepare credit files about borrowers;

B. Obtain credit information through collection, process, maintain analyze the personal and credit information and data relating to the indebtedness of borrowers from banks and financial institutions which extend credit facilities;

C. Issue of credit reports to the inquirers without making recommendations as granting or non-granting of finance;

D. Setup the system that ensure confidentiality of information and data;

E. Establish database;

F. Establish a unit to deal with borrowers;

G. Issue credit reports on the forms prepared therefore;

H. Maintain inquiry requests for a period not less than two years in accordance with the rules and procedures specified by regulations;

I. Provide protection and security system for the agency's systems and database along with formulating an emergency plan for protecting them against any penetrations, loss or damage;

J. Co-ordinate and collaborate with similar foreign institutions through the modality it deems appropriate.

4.5.2   OBJECTIVE OF THE AGENCY:

A. To motivate banking operation in Sudan through developing electric credit information;

B. To help in the implementation of policies and regulations in central bank of Sudan especially in the field of finance;

C. To help banks in decision making;

D. Making credit scoring;

E. Develop Risks' administration in banks;

F. To spread credit information culture in the society;

G. To spread credit environment based on transparency and providing accurate information;

H. To help in implementation of International Islamic measures.

4.5.3 SOURCES OF INFORMATION AND DATA:

Credit information and scoring agency operated as a centralized for collection, preparation, and exchange information between authorized entities for getting inquiries, currently the agency collects both demographic and financial information about the borrowers, the demographic data composed of 9 attributes of the borrowers, depend on them, it helps to issue the CBOSID.

In case when the credit information is inaccurate, incomplete or delayed as a result of such reporting by credit information providers, the borrowers has a right to make a dispute to the agency, and it should reply or make corrective measures to him within two weeks.

Article number (6) of the agency Act mentioned the sources of information that the agency in pursuit of achieving its purposes, can obtained from the following sources:

A. Sudanese banks;

B. Centralized system for registration of credit;

C. Financial institutions which extend credit facilities;

D. Insurance companies;

E. Micro finance institutions;

F. Bodies supervising public registries, including civil registry, commercial registry and land registration with agreement of the applicant;

G. Companies dealing with securities;

H. Other entities with readily available information and data serving the agency purposes upon the approval of the applicant of finance.

The agency collects and prepares credit files, at the minimum one of the following:

1- DEMOGRAPHIC INFORMATION INCLUDES:

I. FOR INDIVIDUALS:

A. Full name of the borrower.

B. His mother name.

C. His wife/wives and /or husband.

D. Nationality.

E. National number.

F. Personal identity.

G. Address.

H. Date of birth.

I. Contact details.

II. FOR COMPANIES AND/OR ORGANIZATIONS:

A. Registration number.

B. Date of registration.

C. Directors.

D. Main address.

E. Contact details.

The agency should issue a unique code for each borrower after completion of his/her demographic data.

2- CIASA SHOULD COLLECT FINANCIAL INFORMATION OF THE BORROWERS INCLUDING :

A. Authorized amount.

B. Date of authorization.

C. Approved amount.

D. Used amount.

E. Outstanding amount.

F. Default amount.

G. Instalment /non instalment.

Also the agency should classify credit files based on central bank of Sudan directives and circulars.

4.5.4 THE AGENCY DATA BASE:

It has been clearly shown that agency database include data and information from different banks and the related bodies. Therefore the Agency can be considered as one the biggest data base in the history of the Sudanese banking system, above all the agency data contains a historical record about customers not less than two years and achieves for five years. The agency can be considered as the first data source and information in the Sudanese banking system. That provides good information and useful ones that cover all credit information in banks and financial corporation, which help to provide credit facilities and finance. Finally, the data base help to combat customers Risks through forecasting.

4.5.5 CREDIT INFORMATION SERVICE:

The credit information and scoring agency provide credit information about the customers for specific goals, which is:

A. Court orders;
B. If the customers apply to kind of finance;
C. Acceptance of guarantee;
D. Determine credit scoring;
E. Revise the customer's credit position;
F. The customers can inform about his credit position.

4.5.6 CREDIT REPORTING SERVICE:

The agency produces five types of credit reports, the types specified as the information they contained as follows:

A. EMPTY REPORT:

Include only demographic data.

B. BASIC REPORT:

Contains demographic data and financial information in aggregates.

C. STANDARD REPORT:

Contains demographic data and financial information and historical information.

D. ADVANCED REPORT:

Include demographic data, financial information, historical information, and details of contracts and instalments.

E. COMPREHENSIVE REPORT:

It is available to the central bank of Sudan and the borrower only; it contains the data and information in the advance report and specified the name of banks /branches which provided finance and credit facilities to the borrower.

4.5.7 CREDIT INQUIRY:

The inquirer should have a legitimate purpose for the inquiry and obtainment of a credit report in the following manner:

A. According to a judicial sentence or with or a ruling issued by an arbitration body.

B. If the customer applied for obtaining any of the types of financing or augmentation or fixing there of or for amendment of its terms.

C. Acceptance of the forms of guarantee.

D. Determination of the credit scoring of the customer applying for the credit or review of his credit position for verifying the extent of his being regular in repaying his obligations.

E. By virtue of an authorization signed by the customer or his legal representative or his authorized agent.

4.5.7.1 OBLIGATIONS OF THE INQUIRERS:

The applicant for inquiry should adhere to the following:

A. Regulations and circulars issued by the central bank of Sudan with respect to utilization of credit reports provided by CIASA;

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B. The purpose of inquiry should be legitimate.

C. By obtaining an authorization from the customer agreeing on the inquiry about him.

D. The inquiry shall be in accordance with the terms of the contract.

E. The credit report should be used solely for the purpose which it was requested.

F. Shall not distribute, circulate, change or amend any item of the credit report which he obtains from CIASA.

4.5.7.2 FEES OF CREDIT INQUIRY:

A. CIASA charges the inquiry reasonable fee for credit reports requested.

B. The fees of credit inquiry only approved by the central bank of Sudan board of directors.

C. The amount of fees of credit inquiries may be amended from time to time.

4.5.8 CREDIT SCORING SERVICE:

The agency provides credit scoring service to the customers. The credit scoring can be defined as a statistical analysis in the credit record of the customer to help him to be awarded about his ability to fulfil his obligations. This help Sudanese banks and financial corporation to make decisions,

4.5.8.1 THE ROLE OF THE AGENCY IN DEVELOPING RISK MANAGEMENT. THIS ROLE CAN BE SHOWN THROUGH VARIOUS ASPECTS:

A. To create morals and good environment for credit information to develop regulations and to analyse credit information;

B. To help banks in putting bases and regulations to bear finance Risks and credit facilities.

C. Determine and distribute authorities in the field of giving finance and credit facilities.

D. To help banks to delegate authorities to the branches.

E. To help bank to authorize its branches in the field of offering funds.

F. To help banks and financial corporations to make internal credit scoring.

G. Controlling system upon risks and follow banking principles on condition that not to exceed the authorities gives in the field of controlling and internal inspection.

H. Building database including information about customers in banks and financial corporations in a centralized way to increase the efficiency and to ensure the accuracy of the banking and monetary system in general.[158]

4.5.8.2   DETERMINANTS OF THE CREDIT SCORING:

The agency should determine the credit scoring for the customers depending on:

A. Credit report of the customer.

B. The data and information submitted by the customer.

C. The credit scoring for the customer should be determined within one month from the date of receiving the application.

D. The duration of credit scoring for the customer is one year.

E. CIASA should issue credit scoring regulations and directives.

4.5.9 PENALTIES FOR NON-COMPLIANCE:

Data and credit information providers and inquirers found to be in violation of the agency regulation shall be subject to administrative penalties as specified in banking control regulation law for the year 2004 or any other relevant law.

Infractions that may result in administrative penalties include but are not limited to failure to report data and credit information, late reporting, incorrect reporting, misuse of credit reports and unauthorized disclosure of confidential credit information.

CIASA board of directors should recommend the administrative penalties. These recommendations should be approved by the governor of the central bank of Sudan. Penalties provided shall not prevent any civil or criminal proceeding under applicable law.[159]

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[158] *Credit information and scoring agency Act,2011*
[159] *Credit information and scoring agency regulations, 2012.*

4.6 SUDANESE ISLAMIC CREDIT SCORING MODEL FOR INDIVIDUALS:

4.6.1 INTRODUCTION:

The motivation for this study is to explore insights into the level of loan delinquency and creditworthiness among the individual borrowers and the lending practice of banks to ultimately reduce the number of nonperforming loans of commercial banks of Sudan.

This study mainly done to build a model for commercial banks with various exhaustive list parameters among different degrees of importance. The proposed credit scoring model will facilitate the banks to check the creditworthiness of the individuals. The proposed credit-scoring model will decide among the good and bad loan applications. The model assess the risk of a borrower by using the generated credit score that will be made by extracting data from loan applications, socio-demographic variables, and credit bureau reports.

Undoubtedly that lending money is risky, but at the same time profitable. Margins and fees on loans are source of profits for banks. Banks do not want to grant credit to those borrowers who are not able to repay the loan. Over time, some of the loans can become bad even if the banks do not want to have bad loans.

Historically, credit risk caused heavy losses to commercial banks functioning in Sudan. The senior management of banks required to design policies, methods, and procedures to measure, monitor and control credit risk. During 2010, the growth rate of non-performing loans (NPLs) in Sudan had risen at a shocking rate of 14.08%, but the growth rate reduced to 7.93% in 2014. Customers are the common defaulters.

By analysing the written off Islamic loans of commercial banks in Sudan, this will assist in taking effectual measures to enhance the quality of credit approval process and ultimately reduce the losses of banks from bad debts. Many written off loans have been caused by the improper management of the loan applications starting from disregarding the accepted rules of loaning. This want to be observed cautiously and banks should take effective measures to minimize bad debts or written off loans in the future.

The commercial banks of Sudan have to find a remedy to reduce their non-performing loans, since the slowdown in the economy; one mostly implemented system for solving this problem is "Credit Scoring."

4.6.2 Model THEORETICAL FRAMEWORK:

4.6.2.1 DEPENDENT VARIABLE

In this study, the 'Credit Score' is the dependent variable. Credit score is a number that denotes the creditworthiness of applicants. The higher the credit score, the higher the creditworthiness of an applicant, while the lower the credit score, the lower the creditworthiness of an applicant.

4.6.2.2   INDEPENDENT VARIABLES OF SICSMI

There were total fifteen independent variables for the credit-scoring model for individuals. Most of these factors are socio- demographic variables.

Table 4.4: Independent Variables of SICSMI:

1	Customer full name	8	Date of birth
2	Customer mother	9	Contact number
3	Customer wife/husband name	10	Gender
4	Nationality	11	Marital status
5	National Number	12	Currency of contract
6	Personal identity	13	Negative status of customer
7	Address	14	Reasons for default

4.6.2.3 MODEL METHODOLOGY:

The sensitivity of the topic turned out to be a bigger constraint, restricting the study sample to be 5,892. These 5,892 customers are those who have applied for the grant of credit and accepted by the bank. The individual's data collected randomly from the well-reputed commercial banks of Sudan.

4.6.2.4 DATA ANALYSIS TOOLS:

Financial tools that were used to calculate the creditworthiness of individuals which includes Descriptive Statistics (Frequency Distribution &Cross Tabulation), the Discriminant Analysis (DA), Logistic Regression analysis on SPSS.

4.6.3 DEVELOPING CREDIT-SCORING MODEL:

The main objective of the study is the design and development of a new and potentially more effective credit scoring model defined as the Sudanese Islamic Credit Scoring Model for Individuals ("SICSMI"). The first step in developing the credit scoring models was finding the different components affecting the creditworthiness of applicants. For identifying the factors many articles and websites related to customer, loans studied.

4.6.3.1 CREDIT SCORING PROCESS:

Figure 4.6

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┌─────────────────────────┐
│   Individual borrower    │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│ Factors considered in    │
│        scoring           │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────────────┐
│                                 │
│  -  Customer full name          │
│  -  Customer mother             │
│  -  Customer wife/husband name  │
│  -  Nationality                 │
│  -  National Number             │
│  -  Personal identity           │
│  -  Address                     │
│  -  Date of birth               │
│  -  Contact number              │
│  -  Gender                      │
│  -  Marital status              │
│  -  Currency of contract        │
│  -  Negative status of customer │
│  -  Reasons for default         │
│                                 │
└─────────────────────────────────┘
            │
            ▼
        ◇ Reach                No    ┌──────────────┐
          cut off  ──────────────────▶│ Reject Loan  │
          score                       └──────────────┘
            │
           Yes
            │
            ▼
   ┌──────────────┐
   │ Accept Loan  │
   └──────────────┘
```
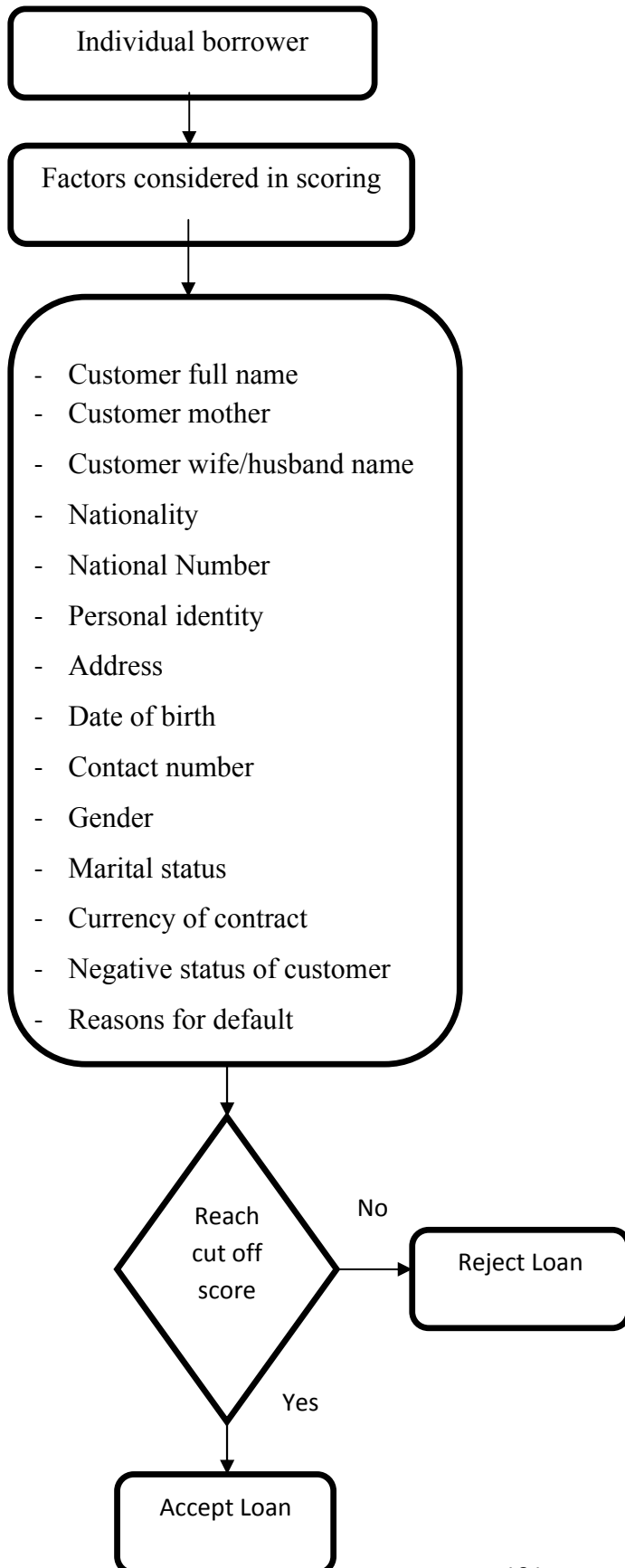
4.6.3.2 SUDANESE ISLAMIC CREDIT SCORING MODEL FOR INDIVIDUALS:

Table 4.5: Sudanese Islamic credit scoring model for individuals:

Factors	score
Customer full name	
o Full name	Yes
o Name is not complete	No
Customer mother name	
o Mother's name is in the records	Yes
o Mother's name is not in the records	No
Customer wife/husband name	
o wife/Husband name is in the records	Yes
o wife/Husband name is not in the records	No
Nationality	
o Sudanese	1
o Non-Sudanese	2
National number	
o National number is in the records	Yes
o National number is not in the records	No
Personal identity	
o Personal Identity is in the records	Yes
o Personal Identity is not in the records	No
Address	
o Complete	1
o Incomplete	2
Date of birth	
o Complete	1
o Incomplete	2
Contact number	
o Complete	1
o Incomplete	2
Gender	
o Male	1
o Female	2
Marital status	
o Single	1
o Married	2
o Divorced	3
o Widowed	4
Currency of Contract	
o SDG	1
o USD	2

○ ECU	3
○ SAR	4
○ AED	5
○ CHF	6
Negative Status of Customer	
○ No negative Status (outstanding)	1
○ negative status (Non Performing)	2
Reasons for default	
○ Customer	1
○ Bank	2
○ External Factors	3
○ Nothing	4

The socio-demographic factors used to measure creditworthiness of individual applicants. Each of factors used in SICSMI has several attributes with certain scores. There are total 14 variables included in the construction of the credit scoring for individuals.

The range of credit scores is from 500 - 720. The maximum credit score that an individual can have is 720 and lowest credit score is 500. Individuals with lower credit scores have more default risk and lower creditworthiness as compared to individuals with high credit score, who have low risk and they are considered to be more creditworthy.

Table 4.6: Score classification

Quality	Credit score	Credit score range	Frequency	Per cent%	Risk class
Excellent	91%-100%	720 and above	214	3.6	E
Good	76%-90%	680-720	116	2.0	D
Fair	61%-75%	620-680	81	1.4	C
Poor	46%-60%	500-620	4854	82.4	B
Very poor	Below 46%	500 and below	627	10.6	A

Source: SPSS tables

When an applicant's credit score lies in the range of 91%-100%, it means he/she will lie in the risk class E that is showing lowest possible risk and bank considered the applicant of highest quality. We have taken 90 to 100% (top 10%) of the maximum score of 720 and above. The second risk class is D having good quality of loan applications; the credit score of this category is of 680 to 720. All applicants having credit score greater than and equal to 500 but less than & equal to 620 will beat the risk class C, having an average quality of loan application.

The cut off score of this model is 500, while the total credit scores are 720. Applicants having total credit score less than 500 will not be qualified for loan, hence rejected.

The lowest possible credit score an individual can have is the cut off score. Any applicant having credit score below 500, will be rejected and any applicant having credit-score above, 500 will be accepted and loan granted to that applicant. Below cut off score, the risk is very high to accept an applicant's loan application and above cut off score there is relatively low depending upon their risk class. Risk class 'E' shows no default risk due to highest credit score. Risk class 'D' shows lowest default risk because of high credit score. Risk class 'C' represents medium level of default/ credit risk as having average level of credit score. Risk class 'B' and 'A' indicates the high level of risk and having below average credit score.

4.6.3.3 DATA ANALYSIS:

In the Sudanese Islamic credit scoring model for individuals, a data set of 5,892 applicants was collected; out of which there were 5,683 males comprises of 96.4% of the total applicants and only 209 females which made 3.6% of the total applicants.

It is concluded that there were 5.8 % defaulter female borrowers as compared to 94.2% of defaulter male borrowers, so females have less probability of default as compared to males, so it is concluded that females were more creditworthy, have less probability of default because they were more financially strong in Sudan as compared to male borrowers.

Table 4.7 Negative Status of Subject * Gender Crosstabulation

			Gender		Total
			Male	Female	
Negative Status of Subject	No negative Status (outstanding)	Count	5110	174	5284
		% within Negative Status of Subject	96.7%	3.3%	100.0%
	negative status (Non Performing)	Count	573	35	608
		% within Negative Status of Subject	94.2%	5.8%	100.0%
Total		Count	5683	209	5892
		% within Negative Status of Subject	96.5%	3.5%	100.0%

Source: SPSS tables

As mentioned above, we have developed a new credit scoring model named as "Sudanese Islamic Credit Scoring Model for Individuals (SICSMI)" which has considered all the important factors such as socio demographic variables, credit history, loan tenure, etc.

6.3.3.1 LOGISTIC REGRESSION:

Table 4.8 : Logistic Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.999(a)	.998	.998	7.75219

Source: SPSS tables

Predictors: (Constant), Q19_1, Reasons for Default, Outstanding Residual Amount before maturity day, Negative Status of Subject, Q18_1, overdue instalments (past due)

The coefficient of determination is 0.998; therefore, about 99.8% of the variation in the scoring of risk is explained by (Reasons for Default, Outstanding Residual Amount before maturity day , Negative Status of Subject, and overdue instalments (past due)The regression equation appears to be very useful for making predictions since the value of r 2 is close to 1.

6.3.3.2 ANOVA(b):

Table 4.9 : ANOVA(b)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	38015849	6	6335974.872	105430.16	.000(a)
	Residual	91046	1515	60.096		
	Total	38106895	1521			

Source: SPSS tables

Predictors: (Constant), Q19_1, Reasons for Default, Outstanding Residual Amount before maturity day, Negative Status of Subject, Q18_1, overdue instalments (past due) b Dependent Variable: Classification risk

The F statistic is the regression mean square (MSR) divided by the residual mean square (MSE). If the significance value of the F statistic is small (smaller than say 0.05) then the independent variables do a good job explaining the variation in the dependent variable. Then the independent variables (Reasons for Default, Outstanding Residual

Amount before maturity day, Negative Status of Subject, and overdue instalments (past due)) explain the variation in the dependent variable (Classification risk), because the sig value is 0.000.

6.3.3.3 FUNCTION STRENGTH

Table (4.10): Testing relationship and the function strength

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	17.872	100.0	100.0	0.973

Source: SPSS tables

The Eigenvalue equal (17.872) is a very good value (Whenever they are greater than the one that was best). That Mean the function is powerful .Canonical Correlation(0.97) is stronger and positive represent ratio of change in dependent variable (good and bad customers) it was discriminate with independent variables and the remaining is (0.3) interoperated (3%) of variance because the different between groups (good and bad customers).

6.3.3.4 DISCRIMINATION ABILITY:

Table (4.11): Testing functional ability to discrimination

Function	Wilks' Lambda	Chi-square	df	P-value
1	0.053	20096.613	6	0.000

Source: SPSS tables

From the table above the p-value of Wilks' Lambda test (0.000) which is less than significant level that mean the function has the ability to discrimination.

6.3.3.5 EXAMPLE COEFFICIENTS:

Table 4.12 :coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	550.232	1.473		373.441	.000
	Negative Status of Subject	-251.282	.581	-.775	-432.243	.000
	Reasons for Default	24.109	.219	.195	110.148	.000
	Outstanding Residual Amount before maturity day	105.775	.892	.440	118.623	.000
	overdue instalments (past due)	17.553	1.021	.065	17.184	.000

Source: SPSS tables

The coefficient table contains the coefficients for the least square (fitted) line and other relative information about the coefficients. In the column B, the constant represents the y-intercept and the Height represents our slope. The equation of the line found from the output is:

$$Y = 550.2-251.2(X_1) +24.1(X_2) +105.8(X_3) +17.6(X_4)$$

Where:

Y = Scoring (classification) risk

X_1= Negative Status of Subject

X_2= Reasons for Default

X_3= Outstanding Residual Amount before maturity day

X_4=overdue instalments (past due)

The table and the equation above illustrate the relation between Scoring (classification) risk and Negative Status of Subject is negative significant because the coefficient is (-251.2) and the sig is equal (0.000), but the relation between Scoring (classification) risk and another independent variables is positive significant.

4.7 CHAPTER SUMMARY:

In summary, this chapter has discussed the findings from the credit application forms leading to implementing the Sudanese Islamic credit-scoring model for individuals. In the first step, the preliminary study conducted through breaking down the overview of the Sudanese banking sector to get an initial overview on customer credit risk and the preliminary establishment of characteristics considered as important in assessing an applicant for customer credit. With regard to customer credit risk, central bank of Sudan establishment of credit risk management departments in CBs, obtaining credit information on borrowers from credit information and scoring agency would enhance risk management practices in Sudanese banks.

In the next step, historical customer data relating to loans were collected from CBs applicant forms (kept as credit files) of a typical Sudanese and analysedto develop the Sudanese credit scoring model for individual. However, potential characteristics were established during the preliminary study and later confirmed because of the model test. It was imperative to test whether those characteristics were statistically significant when considered in the model development process.

CHAPTERV

CONCLUSION, FINDINGS, AND STUDYRECOMMENDATIONS

5.1 INTRODUCTION:

At the outside of this study, the principal aim identified in chapter four was to identify whether the development of an objective credit scoring model was achievable within the Sudanese banking sector. This aim led the researcher to conduct an extensive literature review on customer credit and credit scoring (presented in chapter two and three).

Towards the end of this study journey, this chapter presents the conclusions to the study process by discussing the findings with reference to the study hypothesis and questions, thereafter, findings of the study and implications to professional practice presented. Finally, the future directions and recommendations for study around the area of credit scoring and customer credit risk management and personal reflections presented. The chapter then concludes with a chapter summery.

5.2 DISCUSSION OF THE FINDINGS WITH REFERENCE TO STUDY HYPOTHESIS:

In chapter one, we formulated three principal testable hypothesis on the relationship between credit scoring and creditworthiness assessment, against which this study is anchored. In this section, we subject these propositions to empirical testing drawing from the results of our descriptive and inferential statistical analyses. Our decision rule based on the significances of the t-statistics, which represented by the p-values flagged by the statistical packages used. This is because the existence of a significant relationship could infer from a significant t-statistic.

HYPOTHESIS:

❖ *There is a link between Credit scoring and the evaluation of customer's creditworthiness.*

From the hypothesis above, we assume that there is a significant relationship between credit scoring and the customer creditworthiness. The correlation result shows a positive correlation of .973, which entails that, the high the score, the high the creditworthiness. However, the regression result shows that the positive association observed between the variables is significant with a p-value of 0.000. This also confirms that credit scoring does have significant positive impact

upon customer's creditworthiness. We therefore accept our alternate hypothesis at the expense of the null hypothesis. In addition, as discussed above, credit score is most likely approach in assessing the customer creditworthiness , hence necessarily make the best decisions. In addition, we found a positive relationship between the variables.

❖ *There is a negative correlation between high credit score of a customer and the probability of default within Islamic modes of finance.*

The correlation result of the hypothesis above shows a strong significant positive correlation of .907between the reasons for customer's default and the credit score he gains. The regression result also shows that the positive correlation noticed between the outstanding residual amounts before maturity day is significant at 65%respectively. Based on this result, we therefore reject our alternatehypothesis and accept our null hypothesis. The result depicts that the more high" score owned by the customer, the low the customer's" probability of default.

❖ *Developing and implementing a credit-scoring model may have a significant influence on creditworthiness assessment process of Islamic banks in Sudan.*

From this hypothesis, a positive Eigen value equal (17.872) is a very good value (Whenever they are greater than one). That means the function is powerful. The regression result further reveals that a positive significant relationship with a p -value of 0.000 occurs between the dependent and the independent variables. However, based on these findings, we therefore reject our null hypothesis and accept our alternate hypothesis. This result implies that banks who apply more on credit scoring issues are more likely to do better than those that disclose less.

5.3 DISCUSSION OF THE FINDINGS WITH REFERENCE TO STUDYQUESTIONS:

The outcome of this study is its ability to answer the study questions posed and to provide a direction for future studies. The discussion of finding with the study

questions provides opportunity to ascertain whether the study was able to provide logical answers to study problem presented.

The first question: ***What is the best approach/process to evaluate the creditworthiness of an individual?***

This question answered through the extensive literature reviews. From the literature, we know that "creditworthiness" is an attribute, which makes the candidate suitable for the grant of credit, meaning that the candidate would pay all his/her obligations as per the terms and conditions of the credit. However, creditworthiness is something, which is very abstract until measured. Traditionally, in order to measure the creditworthiness, banks used a subjective framework based on the industry wide acronyms such as the 5Cs to guide their judgmental credit decisions. However, this subjective framework was not free from some of its weaknesses such as the credit officer errors, inconsistency in its application between credit officers, high costs associated with training and employing credit officers, slow credit decisions, inability to consider the high volumes of credit applications and lack of quantifications of the credit risk.

However, with the remarkable growth of the customer credit market in Sudan it became less convenient for banks to use the subjective framework to assist their judgmental credit decision making. Thus, banks should advocate for an alternative approach (credit scoring); which is objective, fast, reliable and consistent also could handle the high volume of credit applications.

The second question: ***What are the attributes/characteristics that banks should consider while assessing an individual for customer Islamic finance?***

Within the literature, the attributes/characteristics that the lenders would consider while assessing an application for customer credit could be grouped as demographic and financial, which have discussed in chapter four. The banks would consider these attributes according to their predictive power, information content, correlations, and legal compliance.

The study processed to establish the characteristics, which the banks would consider while assessing an application for customer credit. Fourteen characteristics relating to applicant full name, mother name, wife/husband name, nationality, national number,

personal identity, address, date of birth, contact number, gender, marital status, currency of contract, negative status, and reasons for default were selected from the application forms of Sudanese banks. Thereafter, after data prepared, the fourteen attributes (as presented in chapter four) were modelled using logistic regression to find out how to predict the probability of default.

Further, the predictive accuracy of the model found to be 46-60 per cent (at cut off value) suggesting that the fourteen attributes were important in objectively assessing the customer for credit. Henceforth, banks could consider credit-scoring technique to assess the creditworthiness of the applicant for Islamic loan in Sudan.

The third question: ***What are the issues to be consider while developing and implementing the credit-scoring model within Islamic modes of finance?***

In order to answer this question, an extensive discussion from the existing literature on the issue of model methodology, analysis, and developing have presented in chapter four. However, the modelling issues in the literature reviews discussed against the background of a long history of credit scoring in a developed customer credit environment. In a new or emerging market, like the Sudanese banking sector, which does not at the time of this study, have any formal credit scoring models, it was important to explore the modelling issues.

From the results of data analysis presented in chapter four, it could be inferred that the historical database of accepted as well as rejected applicants from single time horizon and from population applying for the same Islamic credit products is essential in developing a credit scoring model. The historical database of the borrowers should include all the range of characteristics obtained from the applicants' forms to be considered in modelling process, this would enable the model to statistically select the characteristics, which jointly provide a significant predictor of the loan quality.

The fourth question: ***To what extent is the development of an objective credit scoring model achievable within the Sudanese banking sector?***

By answering the above three questions, this study have presented a thorough examination of the issues relating to the development of an objective credit scoring model consistent to Islamic financing in Sudanese banking sector. The sequential mixed approach comprising of preliminary study, literature review, model development, and

credit application data presented in chapter four has enabled to establish and confirm the characteristics to be consider in the model development process. The model development issues discussed within the literature also as findings from hypothesis testing guided and informed the study process. The final Sudanese Islamic Credit scoring Model for individuals" presented in chapter four shows that the development of an objective credit-scoring model is achievable within the Sudanese banking sector.

5.4 RECOMMENDATIONS OF THE STUDY:

Credit scoring is but one application of a broader approach to managing the business using data and analytics to guide decision-making. Most lenders do not have the volume, data, or risk management department skill set to justify significant investment in a scoring system. Therefore, we think that the best first scoring model for use by the banks will be a generic score developed with positive and negative credit bureau data. Until this model becomes available, we suggest that banks can have an impact by:

- CIASA should initially serve the population and creditors in and around Khartoum and then rapidly expand to the broad areas within commuting distance around Sudan;
- In the medium term, CIASA should help the expansion of the credit markets in these areas. Once consolidated, the bureau can also serve rural banks and other financial institutions;
- While the bank secrecy provision only covers deposits and not loans, the Credit Bureau should require creditors requesting credit reports to obtain the prior approval in writing of the subjects of the credit report;
- The Central Bank of Sudan has a role to play to facilitate the proper and Valuable development of the use of credit references in commercial and financial Transactions;
- The central Bank of Sudan should motivate financial institutions to exchange references with credit bureau that provide privacy and accuracy safeguards;
- The Sudanese Credit Bureau should work with the CBs to develop the credit references industry;

- The Credit Bureau would work best if organized as a for-profit institution with ownership shared by CBs with creditor and business associations;

- Comprehensive credit reporting includes also information provided by non-bank financial institutions, as well as by telecoms, utilities. In Sudan, there is still potential to include such addition data furnishers, a fact that credit bureau should address with increased marketing efforts.

- It is recommended to use such a scoring system which would be capable of assessing the credit risk of a borrower and entire loan portfolio with a unique model which is adaptable to data

- It is highly recommended that commercial banks should use the proposed Sudanese credit-scoring model for individual as a part of their evaluation process. By adopting this model, banks can reduce their non-performing loans. SICSMI have included all the factors that banks consider but in a systematic way.

- For the generalization and accuracy of the results generated by the credit scoring model, it is recommended to have a large data of individual borrowers. New variables can also search which will help predicting the probability of default of individuals and corporations.

- In our current study, we have used the accepted applicants in our sample; it is highly advisable to collect the data of rejected applicants by banks, so that results that are more versatile could obtain.

- It is recommended that future studies should use the advanced credit scoring techniques like genetic algorithms, fuzzy Discriminant analysis and neural networks;

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APPENDICES

Appendix (A)

CIASA Individual disputing form:

Figure	Subject	A statement
1	CustomerID Number	
2	CBOS ID	
3	Nationality	
4	Nationality number	
5	Customer name in Arabic	
6	Customername in English	
7	Mother's name	
8	Address	
9	Telephone	

Dispute subject:

--219---

Signature: _____

Date: _____

- **attachments (if any)**

APPENDIX (B)

Credit information and scoring ACT
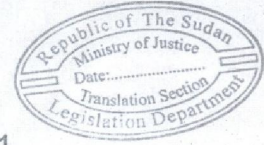
Credit Inquiry and Classification Act 2011

Pursuant to the provisions of the Interim Constitution of the Republic of Sudan, the National Assembly has passed and the President of the Republic has signed the following Act:-

Chapter I

Preliminary Provisions

Title and Commencement

1- This Act may be cited as, (Credit Inquiry and Classification Act 2011 and shall come into force as from the date of signature .

Interpretation

In this Act unless the context otherwise requires:-

"Inquiry", means the available service mode from the information and data of the credit registration system obtainable at the Agency. Whether presently or in the future, concerning the entire obligations of borrowers from banks and institutions which extend credit facilities;

"Bank", means the Central Bank of Sudan;

"Credit Data", Means the amount of the loan or the authorized credit line and the utilized balance ,type of facility, product, or currency, the maturity date, installments and types of collaterals provided thereof, in addition to other credit data that will achieve the purposes of the Agency;

1

"Credit Report"	Means the report issued by the Agency in a paper or electronic form containing some or all information and data available in the credit file of the borrower or a summary thereof;
"Database" :	Means electronic database containing the credit files of borrowers;
"Board":	Means the Board of Directors of the Agency established in accordance with Section (8);
"Board of Directors",	Means the Board of Directors of the Central Bank of Sudan;
"Governor",	Means the Governor of the Bank;
"General Manager",	Means the General Manager of the Agency, appointed in accordance with the provisions of Section (14);
"Inquirer" :	Means any legal person which has a legitimate purpose for inquiring or the borrowers to whom these information pertain;
"Information"	Means the repayment conduct or manner for historical information dating back to five years, at least, and indicating the extent of commitment by the borrowers to repayment on the specified due dates, including positive as well as negative information;
"Provider of Information",	Means any entity authorized to provide any form of financing or any other entity to which personal or credit information or any information or other data related to the

2
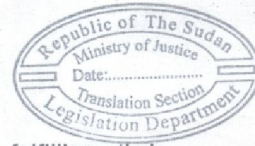
	borrowers' manner in fulfilling their obligations;
"Credit File",	Means the register which contains the positive, negative, personal and credit information relating to the borrowers;
"Financial Institution",	Means any company for placement of funds or for investment purposes or enterprise or an institution conducting any banking business;
"Agency",	Means The Credit Inquiry and Classification Agency established in accordance with the provisions of Section (3);
"Borrower",	Means the natural or legal person who requests or granted financing from banks or other finance institutions;
"Minister",	Means the Minister of Finance and National Economy.

Chapter II

The Agency

Establishment, Headquarters and Supervision

3.(1) An agency shall be established and named (The Credit Inquiry and Classification Agency) and shall have a legal personality common seal and the right of litigation.

(2) The Headquarters of the Agency shall be in Khartoum state .

(3) The Agency shall operate under the supervision of the Governor.

Objects of the Agency

4. The Agency shall have the following Objects, namely to :-

(a) Offer credit inquiry service;

3

(b) Provide and prepare information ;

(c) Exchange information and data with similar foreign agencies;

(d) Carry out credit classification .

Functions and Powers

5.(1) The Agency shall have the following Functions and Powers, to :-

(a) Prepare credit files about borrowers;

(b) Obtain credit information through collection, processe; maintain analyze the personal and credit information and data relating to the indebtedness of borrowers from banks and financial institutions which extend credit facilities;

(c) Issue of credit reports to the inquirers without making recommendations as to granting or non-granting of finance;

(d) Set up the system that ensures confidentiality of information and data;

(e) Establish database;

(f) Establish a unit to deal with the borrowers .

(g) Issue credit reports on the forms prepared therefor ;

(h) Maintain inquiry requests for a period not less than two years in accordance with the rules and procedures specified by regulations ;

(i) Provide protection and security system for the Agency's systems and databases along with formulating an emergency plan for protecting them against any penetration operations, loss or damage ;

(j) Co-ordinate and collaborate with similar foreign institutions through the modality it deems appropriate .

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Information and Data Sources

6.(1) Notwithstanding the provisions of Section (55) of the Banking Regulation Act 2004 or any provision relating to banking secrecy in any other law, the Agency, in pursuit of achieving its purposes, can obtain information and data from the following sources:

(a) Banks operating in the Sudan;

(b) Centralized system for registration of credit in the Bank;

(c) Financial institutions and companies which extend credit facilities;

(d) Insurance companies ;

(e) Micro finance institutions;

(f) Bodies supervising public registries, including civil registry, commercial registry and land registration with the agreement of the applicant for financing ;

(g) Companies dealing in securities;

(h) Other entities with readily available information and data serving the Agency purposes upon the approval of the applicant of Finance .

(2) The sources mentioned in item (1) above should provide the information and data requested by the Agency with the required speed and accuracy .

Chapter III

Board of Directors

Establishment , Constitution and tenure

7.(1) A board shall be established and named "The Agency Board of Directors" to manage affairs and conduct on its behalf the Functions and powers granted thereto, in accordance with the provisions of this Act.

5

(2) The Board shall be constituted by a decision of the Council of Ministers subject to recommendation of the Governor from the Chairman and an appropriate number of members, taking into consideration their representation of the relevant entities, provided that the Manager shall be a member and rapportenr .

(3) The Board shall be responsible to the Governor for its performance .

(4) It is not permissible to combine the positions of General Manger and Chairman of the Board.

(5) The tenure of membership shall be three years renewable for one term.

Function and Powers
of the Board

8.(1) The Board shall be responsible for the general policy of the Agency, supervision of work, exertion of effort to achieve purposes and exercise authority on sound basis . Without prejudice to the generality of the aforesaid the Board shall have the following Functions and Powers, namely to :

(a) formulate rules and regulations which govern the work and activity of the Agency;

(b) supervise the progress of performance and work;

(c) approve the Annual Report pertaining to performance of the Agency work, take decision and issue appropriate directives ;

(d) approve the annual budget and the final account;

(e) submit periodical reports to the Governor on issues relating to the credit inquiry services, credit classification and activities;

(f) compose technical committees to assist the Board in performing its duties ;

(g) formulate an internal regulation for organizing the procedures of . the Board meeting;

(h) exercise any other powers that are necessary for achieving the Agency purposes.

6

(2) The Board may delegate any of its powers to the Chairperson or the committees subject to conditions it deems appropriate .

Release and Vacancy Of Post

9.(1) A member of the Board shall be released from his post in the following situations :-

    (a) lack of medical fitness according to the set medical rules ;

    (b) lack of eligibility ;

    (c) absence without permission or satisfactory justification for three consecutive meetings;

    (d) violation of provisions of Section (11);

    (e) conviction in a crime contravening honor or honesty;

    (f) where the member representing an entity, his representation expired.

(2) The post of the Board member becomes vacant in any of the following situations:-

    (a) issuance of a decision releasing him from his post in accordance with the provisions of item (1);

    (b) acceptance of resignation;

    (c) death .

(3) Where the post is vacant according to the provisions of Item(2), it shall be filled by the same method stipulated under Section 7(2).

Disclosure of Interest

10 A member of the Board who has a direct or indirect interest in any matter or suggestion bending before the Board for consideration, shall disclose to the Board in writing the nature of the interest which link him with that matter or suggestion and he is not permitted to attend at such discussion .

7

Meetings of the Board

11.(1) The Board may held an ordinary meeting ,at least once every three months, upon an invitation by the Chairperson . The Board may, in case of necessity ,hold an extraordinary meeting upon an invitation from the Chairperson or on a request by one third of members.

(2) The Chairperson shall chair the meetings, and in his absence, by the member who is elected by the Board.

(3) The quorum shall be complete by the presence of the majority of members and where quorum is incomplete, another meeting shall be called in a week's time , at most, and the meeting shall be legal by the presence of half of the members .

(4) Decisions of the Board shall be adopted by simple majority and in case of equality of votes the Chairperson shall have a casting vote.

Remuneration of Board Members

12. The Board of Directors determine remunerations of the Chairperson and Members.

Appointment of the General Manager

13. The Agency shall have a General Manager Possess of competence, adequate qualifications and experience in its domain of activity , to be appointed by the Board after consultation with the Minister for a period of three years, renewable once. The Board decision shall specify the terms of service and allowances.

Functions and Powers of the
General Manager

14.(1) The General Manager shall be the chief Executive Officer, responsible for managing the Agency and discharging its affairs in accordance with the policy and directives of the Board. And without

8

prejudice to the generality of the foregoing, the General Manager shall have the following Functions and Powers , namely to :

(a) implement decisions and directives of the Board ;

(b) run the daily business of the Agency;

(c) formulate elaborate programmers and plans for developing and promoting the Agency activities and present the same to the Board for approval ;

(d) take measures which he deems necessary for managing and organizing the Agency ;

(e) prepare the annual report on the performance of the Agency activity and submit the same to the Board;

(f) prepare the annual estimated budget and the final accounts and submit the same to the Board for approval;

(g) represent the Agency with respect to its relations with others;

(h) prepare the organizational structure and job structure for the Agency and present the same to the Board for approval and submit the same to the competent bodies;

(i) sign contracts on behalf of the Agency subject to the required bases and safeguards;

(j) appoint employees at the Agency, approve promotions and disciplin thereof according to the required bases and safeguards;

(k) form committees to assist him in performing his work .

(2) The General Manager may delegate powers to assistants or committees on the terms and conditions which he regards appropriate .

Due Consideration for Secrecy .

15. The Chairperson and Members of the Board, and Employees of the Agency should give due care for absolute secrecy in all matters related to the Agency, unless the Agency has permitted the publishing or circulation thereof.

9

Chapter IV

Inquiry and Classification

Bases and Safeguards of Inquiry and Classification

16.(1) The inquiry shall be conducted in accordance with the following bases and safeguards :

      (a) the inquiry shall be based on the legitimate purposes mentioned in Item(2);

      (b) the credit reports of the borrowers must be obtained before granting the credit, its increase, renewal or modification, provided that the credit report. shall be kept in the borrower's file ;

      (c) leaking of any information or data about the borrowers, their accounts, dealings or enabling others to have access thereto is prohibited save where authorized under the provisions of this Act;

(2) The purpose of inquiry about the borrower becomes legitimate under the following situations :-

      (a) according to an order issued by a court or tribunal ;

      (b) if the borrower has applied for any type of financing, augmentation, renewal or modification thereof ;

      (c) acceptance of finance guarantee for another borrower;

      (d) determining credit classification;

      (e) reviewing the credit position of the borrower for verifying the extent of being regular in repaying obligations.

(3) The borrower or whoever deputized him may inquire about his credit position.

(4) The credit classification for the borrower shall be carried out according to:-

      (a) Credit report.

      (b) Information provided by the borrower about his financial position .

10
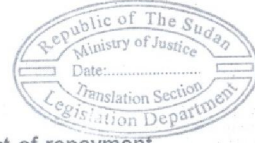
(c) determination of the degree of risk in respect of repayment of the credit through analysis of the information set forth in paragraphs (a) and (b).

Obligations of the Information Provider

17. The information providers should adhere to the following :

(a) verification of accuracy of the information and taking the necessary measures for securing transmission to the Agency ;

(b) updating the information and data pertaining to the borrowers according to the forms prepared by the Agency;

(c) notification of the Agency about any legal proceedings taken against the borrowers within one month, at most from the passing of judgement;

(d) consideration of the complaints lodged by borrowers, correction of information if proved wrong and relay correction to the Agency within ten days, at most, from the date the complaint was received;

(e) maintaining of a database per the incoming complaints and results of their checking .

Obligations of the Inquirer

18. The inquirer shall adhere to the following :

(a) the Regulations and Circulars issued by the Bank regarding use of the credit reports provided by the Agency;

(b) utilization of the credit report for the purpose for which it was requested and non-use for any purposes that might be detrimental to the borrowers or the banks ;

(c) maintaining secrecy of the information contained in the credit report and non-discussion of the same with the others;

(d) non-alteration or modification of items of the credit report which was obtained from the Agency ;

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(e) non-inquiry on behalf of another party except with authorization;

(f) notification of the borrower to whom it was decided to grant or deny credit by issuing a credit report about the borrower and his right of objection to the report ;

(g) that the inquiry shall be conducted by officials authorized from the part of the inquirer who shall notify the Agency of them and of any change regarding those persons.

The relation of Agency and borrower

19.(1) The Agency may give the borrower a copy of his credit report after paying the prescribed fees.

(2) The borrower has the right to lodge a complaint objecting the accuracy of information and data.

(3) The Agency shall examine the complaint and decide within a period of fifteen business day, at most , from the date of receiving the complaint .

(4) Where the Agency rejected the complaint or not decided thereon within the specified duration in item (3), the borrower may complain to the Governor within two weeks and the Governor shall respond within a period of one month, at most.

Chapter V

Financial Provisions

Financial Resources

20. The financial resources of the Agency composed of:-

(1) Funds allocated by the Government.

(2) Fees from the services rendered by the Agency.

(3) Grants and gifts of a technical nature approved by the Board.

(4) Other resources approved by the Board.

12

Budget

21. The Agency shall have an annual budget in accordance with the sound accounting principles .

Accounts ,Books, Records and
Funds Depositing

22.(1) The Agency shall maintain accurate accounts covering its activities in accordance with the sound accounting principles, books and related records.

(2) The Agency shall deposit its funds with the Bank or other bank in current or deposit account, provided that dealing in these accounts shall be through the modality approved by the Board.

Audit

23. The National Audit Chamber, or whoever authorized thereby, shall audit the accounts of the Agency at the end of fiscal year .

Final Account and Reports

24.(1) The Board shall submit to the Governor within three months from the end of the fiscal year, the following statements and reports:

(a) Statements of the final account of the Agency;

(b) Report of the National Audit Chamber on the Agency accounts;

(c) Report indicating the work progress in the Agency during the previous fiscal year and the plans relating to future finance and expenditure .

(2) The Agency shall publish an annual report showing results of activities, including the endorsed final account and shall provide the Governor with a copy of such report

13

Fiscal Year

25.(1) The fiscal year of the Agency starts with the beginning of the fiscal year of the Government and ends with it.

(2) The first fiscal year of the Agency starts from the date the Agency resumes its activity and ends by the end of such fiscal year.

Fees

26. The Board shall determine, from time to time, with the approval of the Board of Directors, fees of the services rendered by the Agency.

Chapter VI

General Provisions

Exemption from Taxes

And Fees

27. The Agency shall be exempted from all taxes and fees.

Agency Funds

28. The Agency capital shall be considered as public funds for the purposes of Criminal Law.

Notification of Hacking Operations

29. The Agency shall notify the Board about any hacking operation to its systems and the measures which have been adopted to restrict the operational risks.

Liquidation of the Agency

30. The Agency may not be liquidated save by a law .

14

Penalties

31. Without prejudice to other penalties decided by other laws whoever contravenes the provisions of this Act shall be penalized, upon conviction, by imprisonment for a term not exceeding two years or by fine or by both.

Power to make Regulations

32. The Board may make necessary regulations for implementing the provisions of this Act.

Testimony

It is hereby certified that the National Assembly has passed the "Credit Inquiry and Classification Act" 2011 in its meeting No.(42) of third session on 20 Shaaban ,1432H, that is on 21st July, 2011. The Permanent Joint Committee for the two assemblies has also decided in its meeting No.(3) on 25 Shaaban ,1432H, that is on 26th July 2011 this Act does not affect the interests of the States.

Ahmed Ibrahim El Tahir
Speaker of the National Assembly
Chairperson of the Permanent Joint
Committee for the Two Assemblies

Agreed :
Marshal/Omer
Hassan Ahmed El Bashir
President of the Repulic
Date 15/09/1432H Corresponding
15/08/2011

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APPENDIX (C)

CREDIT BUREAU CENTRAL BANK OF SUDAN
BASIC INDIVIDUAL CREDIT REPORT

CURRENT SUBJECT DATA

Personal information:

CBOS Id:	**Date of last update:**
Full name:	
Full name english:	
Nationality:	**Date of first insertion:**
First name:	**Date of birth:**
Second name:	**City of Birth:**
Third name:	**Country of birth:**
Fourth name:	**State of Birth:**
Nationality Id:	**Citizenship:**
Next names	
Mother name:	
Nickname:	**Borrower classification:**
Gender:	*Education:*
Marital status:	*Average monthly expenditures:*
Number of dependants - spouses:	*Salary/Income:*
Occupation:	*Number of dependants - children:*
Employer:	
Spouse names:	

Identifications:

Identification (Occurrence: 1-n):

Id type:	**Id number:**
Date of Id issuance:	*Location of the Id issuance:*
Expiration date:	

Addresses:

Address: (Occurrence: 1-n)

Address type:	**Country:**

State:	Province:
City:	*Area:*
Street / Block:	*Postal code:*
P.O. Box:	*House number:*

Contacts:(Occurrence: 0-1)

Contact (Occurrence: 0-n):

Contact type:	Contact value:

Trading license information: (Occurrence: 0-1)

Trading license data: (Occurrence: 0-n)

Trade name english:	*Trade name arabic:*
Registration Id	*Registration country*
Tax Id	*Establishment date*

NEGATIVE STATUSES

Current negative statuses:

Current negative statuses of subject:

Subject negative status: (Occurrence: 0-n)	Date of first registration:

Current negative statuses of contracts (all types of contracts where subject is in role Main debtor or Codebtor):

Contract negative status: (Occurrence: 0-n)	Date of first registration:

NUMBER OF INQUIRIES

Number of inquiries made on this Subject:

During last 1 month:	During last 6 months:
During last 3 months:	During last 12 months:

Detailed log of inquiries for last 3 monthes:

Date of inquiry:	Subscriber name:

SUMMARY INFORMATION ABOUT CONTRACTS

Summary for all types of operations (where subject in role Main debtor or Codebtor)

Total debt overdue (after maturity day):	Number of existing operations:
Total number of unpaid instalments (instalment operations only):	Number of terminated operations:
Total outstanding amount (before maturity day):	

The legal consent of the client. TO be specified by CBOS. TODO

END OF CREDIT REPORT

Date and time of Issue: current date and time

Contact information of CBOS. TODO

APPENDIX (D)

Basic Credit report for Company

CREDIT BUREAU CENTRAL BANK OF SUDAN

BASIC COMPANY CREDIT REPORT

CURRENT SUBJECT DATA

Company information:

CSOB Code:	**Date of last update:**
Registration country:	**Date of first insertion:**
Company Full Name:	**Company Full Name - English:**
Registration number:	**Legal framework:**
Nickname English:	*Nickname Arabic:*
Capital:	**Establishment date:**
Number of shares (Total):	*Number of shareholders:*

Contact persons:

Contact person: (occurrence 0-n)

Name:	*Phone number:*
Position of contact person:	

Identifications:

Identification (Occurrence: 1-n):	
Id type:	Id number:
Date of Id issuance:	*Location of the Id issuance:*
Expiration date:	

Addresses:

Address: (Occurrence: 1-n)	
Address type:	Country:
State:	Province:
City:	*Area:*
Street / Block:	*Postal code:*
P.O. Box:	*House number:*

Contacts:(Occurrence: 0-1)

Contact (Occurrence: 0-n):	
Contact type:	Contact value:

NEGATIVE STATUSES

Sections: Negative statuses, Number of inquiries, Summary information about contracts are the same as in the Basic Individual report

APPENDIX (E)

Basic Credit report for Organization

CREDIT BUREAU CENTRAL BANK OF SUDAN

BASIC ORGANIZATION CREDIT REPORT

CURRENT SUBJECT DATA

Organization information:

CSOB Code:	Date of last update:
Nationality:	Date of first insertion:
Organization Full Name:	Organization Full Name - English:
Accreditied party:	Establishment date:

OrganizationType: *Number of shareholders:*

Number of shares (Total):

Contact persons:

Contact person: (occurrence 0-n)

Name: *Phone number:*

Position of contact person:

Addresses:

Address: (Occurrence: 1-n)

Address type: **Country:**

State: **Province:**

City: *Area:*

Street / Block: *Postal code:*

P.O. Box: *House number:*

Contacts:(Occurrence: 0-1)

Contact (Occurrence: 0-n):

Contact type: **Contact value:**

NEGATIVE STATUSES

Sections: Negative statuses, Number of inquiries, Summary information about contracts are the same as in the Basic Individual report

APPENDIX (F)

Standard Credit report for INDIVIDUAL:

CREDIT BUREAU CENTRAL BANK OF SUDAN

STANDARD INDIVIDUAL CREDIT REPORT

CURRENT SUBJECT DATA

Personal information:

CBOS Id:	**Date of last update:**
Full name:	
Full name English:	
Nationality:	**Date of first insertion:**
First name:	**Date of birth:**
Second name:	**City of Birth:**
Third name:	**Country of birth:**
Fourth name:	**State of Birth:**
Nationality Id:	**Citizenship:**
Next names	
Mother name:	
Nickname:	**Borrower classification:**
Gender:	*Education:*
Marital status:	*Average monthly expenditures:*
Number of dependants - spouses:	*Salary/Income:*
Occupation:	*Number of dependants - children:*
Employer:	
Spouse names:	

Identifications:

Identification (Occurrence: 1-n):

Id type:	**Id number:**
Date of Id issuance:	*Location of the Id issuance:*
Expiration date:	

Addresses:

Address: (Occurrence: 1-n)

Address type:	**Country:**
State:	**Province:**
City:	*Area:*
Street / Block:	*Postal code:*
P.O. Box:	*House number:*

Contacts:(Occurrence: 0-1)

Contact (Occurrence: 0-n):	
Contact type:	**Contact value:**

Trading license information: (Occurrence: 0-1)	
Trading license data: (Occurrence: 0-n)	
Trade name english:	*Trade name arabic:*
Registration Id	*Registration country*
Tax Id	*Establishment date*

NEGATIVE STATUSES

Current negative statuses:

Current negative statuses of subject:	
Subject negative status: (Occurrence: 0-n)	**Date of first registration:**
Current negative statuses of contracts (all types of contracts where subject is in role Main debtor or Codebtor):	
Contract negative status: (Occurrence: 0-n)	**Date of first registration:**

NUMBER OF INQUIRIES

Number of inquiries made on this Subject:

During last 1 month:	**During last 6 months:**
During last 3 months:	**During last 12 months:**

Detailed log of inquiries for last 3 monthes:

Date of inquiry:	**Subscriber name:**

SUMMARY INFORMATION ABOUT CONTRACTS

Summary for all types of operations (where subject in role Main debtor or Codebtor)

Total debt overdue (after maturity day):	**Number of existing operations:**
Total number of unpaid instalments (instalment operations only):	**Number of terminated operations:**
Total outstanding amount (before maturity day):	

DETAILED INFORMATION ABOUT EXISTING CONTRACTS, ROLE OF SUBJECT: DEBTOR, CO-DEBTOR

Instalment contract: (Occurrence 0-n)

General information	
Code of contract:	*Credit purpose:*

Total Amount:	**Real credit amount taken by Client:**
Currency of contract:	**Role of subject:**
Currency of payments:	**Creditor:**
Phase:	**Rescheduled contract:**
Profit margin:	**Exchange rate:**
Cash margin:	**Finance mode:**
Finance duration:	**Sector:**
Legal action taken by bank:	**Finance size:**
Commodity:	*Reason for default:*
Area of utilization:	*Additional fees sum*
Source of finance:	*Additional fees paid*
Finance type:	**Letter of Credits /Letter of Guarantee number:**
Correspondent:	
Remark:	

Current Negative status:

Current Negative status:	**Date of registration:**

Dates:

Start date:	**Date of approval:**
Date of last payment:	**Expiry date of credit:**
Overdue date:	**Real end date:**

Connected subjects:

ID connected person:	**Subject type:**
Full name of Client in Arabic:	**Role of connected person:**

Guarantee: (Occurrence: 0-n)

Type of Guarantee:	**Value of Guarantee:**
Guarantor Id:	*Guarantor type:*
Full name of client in arabic:	
Guarantee description:	
Comment:	

Contract details:

Type of instalments	**Periodicity of payments:**
Periodical Instalment Amount:	**Total number of instalments:**
Manner of Payment:	*Method of payment:*
Overdue Amount after maturity day:	**Nr. of Outstanding Residual Instalments:**
Total number of overdue instalments(past due):	**Outstanding Amount before maturity day:**

Non-instalment contract: (Occurrence 0-n)

General information

Code of contract:	**Credit purpose:**
Total Amount:	**Real credit amount taken by Client:**
Currency of contract:	**Role of subject:**
Currency of payments:	**Creditor:**
Phase:	*Rescheduled contract:*
Profit margin:	**Exchange rate:**
Cash margin:	**Finance mode:**
Finance duration:	**Sector:**
Legal action taken by bank:	**Finance size:**
Commodity:	*Reason for default:*
Area of utilization:	*Additional fees sum*
Source of finance:	*Additional fees paid*
Finance type:	*Letter of Credits /Letter of Guarantee number:*
Correspondent:	
Remark:	

Current Negative status:

Current Negative status:	**Date of registration:**

Dates:

Start date:	**Date of approval:**
Date of last payment:	*Expiry date of credit:*
Overdue date:	*Real end date:*

Connected subjects:

ID connected person:	**Subject type:**
Full name of Client in Arabic:	**Role of connected person:**

Guarantee: (Occurrence: 0-n)

Type of Guarantee:	**Value of Guarantee:**
Guarantor Id:	*Guarantor type:*
Full name of client in arabic:	
Guarantee description:	
Comment:	

Contract details:

Re-paid Amount:	**Manner of Payment:**

Credit card and revolving: (Occurrence 0-n)

General information

Code of contract:	**Credit purpose:**
Total Amount:	**Real credit amount taken by Client:**
Currency of contract:	**Role of subject:**
Currency of payments:	**Creditor:**
Phase:	*Rescheduled contract:*
Profit margin:	**Exchange rate:**
Cash margin:	**Finance mode:**
Finance duration:	**Sector:**
Legal action taken by bank:	**Finance size:**
Commodity:	*Reason for default:*
Area of utilization:	*Additional fees sum*
Source of finance:	*Additional fees paid*
Finance type:	*Letter of Credits /Letter of Guarantee number:*
Correspondent:	
Remark:	

Current Negative status:

Current Negative status:	**Date of registration:**

Dates:

Start date:	**Date of approval:**
Date of last payment:	*Expiry date of credit:*
Overdue date:	*Real end date:*

Connected subjects:

ID connected person:	**Subject type:**
Full name of Client in Arabic:	**Role of connected person:**

Guarantee: (Occurrence: 0-n)

Type of Guarantee:	**Value of Guarantee:**
Guarantor Id:	*Guarantor type:*
Full name of client in arabic:	
Guarantee description:	
Comment:	

Contract details:

Periodical Instalment Amount:	**Periodicity of payments:**
Outstanding Amount before maturity day:	*Method of payment:*
Overdue Amount after maturity day:	**Manner of Payment:**

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Invoice / bill: (Occurrence 0-n)

General information

Code of contract:	**Credit purpose:**
Total Amount:	**Real credit amount taken by Client:**
Currency of contract:	**Role of subject:**
Currency of payments:	**Creditor:**
Phase:	*Rescheduled contract:*
Profit margin:	**Exchange rate:**
Cash margin:	**Finance mode:**
Finance duration:	**Sector:**
Legal action taken by bank:	**Finance size:**
Commodity:	*Reason for default:*
Area of utilization:	*Additional fees sum*
Source of finance:	*Additional fees paid*
Finance type:	*Letter of Credits /Letter of Guarantee number:*
Correspondent:	
Remark:	*Remark*

Current Negative status:

Current Negative status:	**Date of registration:**

Dates:

Start date:	**Date of approval:**
Date of last payment:	*Expiry date of credit:*
Overdue date:	*Real end date:*

Connected subjects:

ID connected person:	**Subject type:**
Full name of Client in Arabic:	**Role of connected person:**

Guarantee: (Occurrence: 0-n)

Type of Guarantee:	**Value of Guarantee:**
Guarantor Id:	*Guarantor type:*
Full name of client in arabic:	
Guarantee description:	
Comment:	

Contract details:

Issuer of the invoice:	**Not paid invoice / bill amount:**
Object of invoice / bill:	

Additional information:

Historical calendar:

The legal consent of the client. TO be specified by CBOS. TODO

END OF CREDIT REPORT

Date and time of Issue: current date and
time

contact information of CBOS. TODO

APPENDIX (G)

Standard Credit report for Company

CREDIT BUREAU CENTRAL BANK OF SUDAN
STANDARD COMPANY CREDIT REPORT

CURRENT SUBJECT DATA

Company information:

CSOB Code:	**Date of last update:**
Registration country:	**Date of first insertion:**
Company Full Name:	**Company Full Name - English:**
Registration number:	**Legal framework:**
Nickname English:	*Nickname Arabic:*
Capital:	**Establishment date:**
Number of shares (Total):	*Number of shareholders:*

Contact persons:

Contact person: (occurrence 0-n)

Name:	*Phone number:*
Position of contact person:	

Identifications:

Identification (Occurrence: 1-n):

Id type:	**Id number:**
Date of Id issuance:	*Location of the Id issuance:*
Expiration date:	

Addresses:

Address: (Occurrence: 1-n)

Address type:	**Country:**
State:	**Province:**
City:	*Area:*

Street / Block:	Postal code:
P.O. Box:	House number:

Contacts:(Occurrence: 0-1)

Contact (Occurrence: 0-n):

Contact type:	Contact value:

NEGATIVE STATUSES

Sections: Negative statuses, Number of inquiries, Summary imformation about contracts, Detailed information about contracts are the same as in the Standard Individual report

APPENDIX (H)

standard Credit report for Organization

CREDIT BUREAU CENTRAL BANK OF SUDAN

STANDARD ORGANIZATION CREDIT REPORT

CURRENT SUBJECT DATA

Organization information:

CSOB Code:	Date of last update:
Nationality:	Date of first insertion:
Organization Full Name:	Organization Full Name - English:
Accreditied party:	Establishment date:
OrganizationType:	*Number of shareholders:*
Number of shares (Total):	

Contact persons:

Contact person: (occurrence 0-n)

Name:	*Phone number:*
Position of contact person:	

Addresses:

Address: (Occurrence: 1-n)

Address type:	Country:

State:		Province:
City:		Area:
Street / Block:		Postal code:
P.O. Box:		House number:

Contacts:(Occurrence: 0-1)	
Contact (Occurrence: 0-n):	
Contact type:	Contact value:

NEGATIVE STATUSES

Sections: Negative statuses, Number of inquiries, Summary imformation about contracts, Detailed information about contracts are the same as in the Standard Individual report

APPENDIX (I)

Advanced Credit report for INDIVIDUAL:

CREDIT BUREAU CENTRAL BANK OF SUDAN

ADVANCED INDIVIDUAL CREDIT REPORT

CURRENT SUBJECT DATA

Personal information:

CBOS Id:	Date of last update:
Full name:	
Full name english:	
Nationality:	Date of first insertion:
First name:	Date of birth:
Second name:	City of Birth:
Third name:	Country of birth:
Fourth name:	State of Birth:

Nationality Id:	**Citizenship:**
Next names	
Mother name:	
Nickname:	**Borrower classification:**
Gender:	*Education:*
Marital status:	*Average monthly expenditures:*
Number of dependants - spouses:	*Salary/Income:*
Occupation:	*Number of dependants - children:*
Employer:	
Spouse names:	

Identifications:

Identification (Occurrence: 1-n):

Id type:	**Id number:**
Date of Id issuance:	*Location of the Id issuance:*
Expiration date:	

Addresses:

Address: (Occurrence: 1-n)

Address type:	**Country:**
State:	**Province:**
City:	*Area:*
Street / Block:	*Postal code:*
P.O. Box:	*House number:*

Contacts:(Occurrence: 0-1)

Contact (Occurrence: 0-n):

Contact type:	**Contact value:**

Trading license information: (Occurrence: 0-1)

Trading license data: (Occurrence: 0-n)

Trade name english:	*Trade name arabic:*
Registration Id	*Registration country*
Tax Id	*Establishment date*

HISTORICAL SUBJECT DATA (Occurrence: 0-1)

Personal information:(Occurrence: 0-1)

Full name english: (Occurrence: 0-n)	**Date of last update:**

Full name: (Occurrence: 0-n)	Date of last update:
First name: (Occurrence: 0-n)	Date of last update:
Second name: (Occurrence: 0-n)	Date of last update:
Third name: (Occurrence: 0-n)	Date of last update:
Fourth name: (Occurrence: 0-n)	Date of last update:

Identifications:(Occurrence: 0-1)

Identification data (Occurrence: 0-n):

Id type:	Id number:
Date of Id issuance:	Location of the Id issuance:
Expiration date:	Date of last update:

Addresses:(Occurrence: 0-1)

Address: (Occurrence: 0-n)

Address type:	Country:
State:	Province:
City:	*Area:*
Street / Block:	*Postal code:*
P.O. Box:	*House number:*
	Date of last update:

Contacts:(Occurrence: 0-1)

Contact (Occurrence: 0-n):

Contact type:	Contact value:
	Date of last update:

NEGATIVE STATUSES

Current negative statuses:

Current negative statuses of subject:

Subject negative status: (Occurrence: 0-n)	Date of first registration:

Current negative statuses of contracts (all types of contracts where subject is in role Main debtor or Codebtor):

Contract negative status: (Occurrence: 0-n)	Date of first registration:

Current negative statuses of contracts (all types of contracts where subject is in role Guarantor):

Contract negative status: (Occurrence: 0-n)	Date of first registration:

Historical negative statuses:

Historical negative statuses of Subject:

Subject negative status: (Occurrence: 0-n)	Date of last update:

Date of first registration:

Historical negative statuses of contracts (all types of contracts where subject is in role Main debtor or Codebtor):

Contract negative status: (Occurrence: 0-n)   **Date of last update:**

Date of first registration:

Historical negative statuses of contracts (all types of contracts where subject is in role Guarantor):

Contract negative status: (Occurrence: 0-n)   **Date of last update:**

Date of first registration:

NUMBER OF INQUIRIES

Number of inquiries made on this Subject:

During last 1 month:	**During last 6 months:**
During last 3 months:	**During last 12 months:**

Detailed log of inquiries for last 3 monthes:

Date of inquiry:	**Subscriber name:**

RELATIONS - LINKED SUBJECTS (Occurrence 0-n)

Current relations to legal entities:

Legal entity relation: (Occurrence 0-n)

Registration number:	**Legal entity name arabic:**
CBOS Id:	**Legal entity name english:**
Relation type:	*Value of shares owned (in %)*
Value of shares owned (amount)	
Additional Information	

Current relations to individuals:

Individual relation: (Occurrence 0-n)

CBOS Id:	**Full name arabic:**
Relation type:	**Full name english:**
Additional Information	*AdditionalInformation*

SUMMARY INFORMATION ABOUT CONTRACTS

Summary for all types of operations (where subject in role Main debtor or Codebtor)

Total debt overdue (after maturity day):	**Number of existing operations:**
Total number of unpaid instalments (instalment operations only):	**Number of terminated operations:**

Total outstanding amount (before maturity day):	

Summary for all types of operations (where subject in role Guarantor)

Total debt overdue (after maturity day):	**Number of existing operations:**
Total number of unpaid instalments (instalment operations only):	**Number of terminated operations:**
Total outstanding amount (before maturity day):	

DETAILED INFORMATION ABOUT EXISTING CONTRACTS, ROLE OF SUBJECT: DEBTOR, CO-DEBTOR

Instalment contract: (Occurrence 0-n)

General information

Code of contract:	**Credit purpose:**
Total Amount:	**Real credit amount taken by Client:**
Currency of contract:	**Role of subject:**
Currency of payments:	**Creditor:**
Phase:	**Rescheduled contract:**
Profit margin:	**Exchange rate:**
Cash margin:	**Finance mode:**
Finance duration:	**Sector:**
Legal action taken by bank:	**Finance size:**
Commodity:	*Reason for default:*
Area of utilization:	*Additional fees sum*
Source of finance:	*Additional fees paid*
Finance type:	**Letter of Credits /Letter of Guarantee number:**
Correspondent:	
Remark:	

Current Negative status:

Current Negative status:	**Date of registration:**

All historical negative statuses: (Occurrence: 0-1)

Historical negative status: (Occurrence: 0-n)	**Date of last update:**
Date of first registration:	

Dates:

Start date:	**Date of approval:**
Date of last payment:	**Expiry date of credit:**
Overdue date:	**Real end date:**

Connected subjects:

ID connected person: Subject type:

Full name of Client in Arabic: Role of connected person:

Guarantee: (Occurrence: 0-n)

Type of Guarantee: Value of Guarantee:

Guarantor Id: *Guarantor type:*

Full name of client in arabic:

Guarantee description:

Comment:

Contract details:

Type of instalments   Periodicity of payments:

Periodical Instalment Amount: Total number of instalments:

Manner of Payment: *Method of payment:*

Overdue Amount after maturity day: Nr. of Outstanding Residual Instalments:

Total number of overdue instalments(past due):   Outstanding Amount before maturity day:

Month/Year	12/2009	01/2010	02/2010	03/2010	04/2010	05/2010
Total amount of credit	36,000	36,000	36,000	36,000	36,000	36,000
Real credit amount taken by Client	25,000	25,000	25,000	25,000	25,000	25,000
Overdue instalments count	1	1	2	3	4	5
Overdue amount	1,000	1,000	2,000	3,000	4,000	5,000
Outstanding amount	12,000	11,000	10,000	9,000	8,000	7,000
Month/Year	06/2009	07/2009	08/2009	09/2009	10/2009	11/2009
Total amount of credit	36,000	36,000	36,000	36,000	36,000	36,000
Real credit amount taken by Client	36,000	36,000	36,000	36,000	36,000	36,000
Overdue instalments count	0	0	0	0	0	0
Overdue amount	0	0	0	0	0	0
Outstanding amount	18,000	17,000	16,000	15,000	14,000	13,000

Non-instalment contract: (Occurrence 0-n)

General information

Code of contract: Credit purpose:

Total Amount: Real credit amount taken by Client:

Currency of contract: Role of subject:

Currency of payments: Creditor:

Phase: Rescheduled contract:

Profit margin: Exchange rate:

Cash margin: Finance mode:

Finance duration: Sector:

Legal action taken by bank: Finance size:

Commodity: *Reason for default:*

Area of utilization: *Additional fees sum*

Source of finance: *Additional fees paid*

Finance type: *Letter of Credits /Letter of Guarantee number:*

Correspondent:

Remark:

Current Negative status:

Current Negative status: Date of registration:

All historical negative statuses: (Occurrence: 0-1)

Historical negative status: (Occurrence: 0-n)   Date of last update:

Date of first registration:

Dates:

Start date: Date of approval:

Date of last payment: *Expiry date of credit:*

Overdue date: *Real end date:*

Connected subjects:

ID connected person: Subject type:

Full name of Client in Arabic: Role of connected person:

Guarantee: (Occurrence: 0-n)

Type of Guarantee: Value of Guarantee:

Guarantor Id: *Guarantor type:*

Full name of client in arabic:

Guarantee description:

Comment:

Contract details:

Re-paid Amount: Manner of payment

Historical calendar:

Month/Year	12/2009	01/2010	02/2010	03/2010	04/2010	05/2010
Limit of credit	4,200	4,200	4,200	4,200	4,200	4,200
Used amount	3,800	3,800	3,800	4,000	4,000	4,500
Re-paid amount	0	0	0	0	0	300
Month/Year	06/2009	07/2009	08/2009	09/2009	10/2009	11/2009
Limit of credit	3,500	3,500	4,200	4,200	4,200	4,200
Used amount	4,000	4,000	1,500	1,500	1,500	1,500
Re-paid amount	500	500	0	0	0	300

Credit card and revolving: (Occurrence 0-n)

General information

Code of contract: Credit purpose:

Total Amount: **Real credit amount taken by Client:**

Currency of contract: **Role of subject:**

Currency of payments: **Creditor:**

Phase: *Rescheduled contract:*

Profit margin: **Exchange rate:**

Cash margin: **Finance mode:**

Finance duration: **Sector:**

Legal action taken by bank: **Finance size:**

Commodity: *Reason for default:*

Area of utilization: *Additional fees sum*

Source of finance: *Additional fees paid*

Finance type: *Letter of Credits /Letter of Guarantee number:*

Correspondent:

Remark:

Current Negative status:

Current Negative status: **Date of registration**

All historical negative statuses: (Occurrence: 0-1)

Historical negative status: (Occurrence: 0-n) **Date of last update:**

Date of first registration:

Dates:

Start date: **Date of approval:**

Date of last payment: *Expiry date of credit:*

Overdue date: *Real end date:*

Connected subjects:

ID connected person: **Subject type:**

Full name of Client in Arabic: **Role of connected person:**

Guarantee: (Occurrence: 0-n)

Type of Guarantee:	*Value of Guarantee:*
Guarantor Id:	*Guarantor type:*
Full name of client in arabic:	
Guarantee description:	
Comment:	

Contract details:

Periodical Instalment Amount:	**Periodicity of payments:**
Outstanding Amount before maturity day:	*Method of payment:*
Overdue Amount after maturity day:	**Manner of Payment:**

Month/Year	12/2009	01/2010	02/2010	03/2010	04/2010	05/2010
Total amount of credit	-	1,500	1,500	1,500	1,500	1,500
Overdue amount	-	0	0	200	0	150
Outstanding amount	-	1,300	1,100	1,000	1,000	1,100
Month/Year	06/2009	07/2009	08/2009	09/2009	10/2009	11/2009
Total amount of credit	-	-	-	-	-	-
Overdue amount	-	-	-	-	-	-
Outstanding amount	-	-	-	-	-	-

Invoice / bill: (Occurrence 0-n)

General information

Code of contract:	**Credit purpose:**
Total Amount:	**Real credit amount taken by Client:**
Currency of contract:	**Role of subject:**
Currency of payments:	**Creditor:**
Phase:	*Rescheduled contract:*
Profit margin:	**Exchange rate:**
Cash margin:	**Finance mode:**
Finance duration:	**Sector:**
Legal action taken by bank:	**Finance size:**
Commodity:	*Reason for default:*
Area of utilization:	*Additional fees sum*
Source of finance:	*Additional fees paid*

Finance type: *Letter of Credits /Letter of Guarantee number:*

Correspondent:

Remark:

Current Negative status:

Current Negative status: **Date of registration:**

All historical negative statuses: (Occurrence: 0-1)

Historical negative status: (Occurrence: 0-n)   **Date of last update:**

Date of first registration:

Dates:

Start date: **Date of approval:**

Date of last payment: *Expiry date of credit:*

Overdue date: *Real end date:*

Connected subjects:

ID connected person: **Subject type:**

Full name of Client in Arabic: **Role of connected person:**

Guarantee: (Occurrence: 0-n)

Type of Guarantee: **Value of Guarantee:**

Guarantor Id: *Guarantor type:*

Full name of client in arabic:

Guarantee description:

Comment:

Contract details:

Issuer of the invoice: **Not paid invoice / bill amount:**

Object of invoice / bill:

Additional information:

Historical calendar:

The legal consent of the client. TO be specified by CBOS. TODO

END OF CREDIT REPORT

contact information of CBOS. TODO

APPENDIX (J)

Advanced Credit report for Company

CREDIT BUREAU CENTRAL BANK OF SUDAN

ADVANCED COMPANY CREDIT REPORT

CURRENT SUBJECT DATA

Company information:

CSOB Code:	**Date of last update:**
Registration country:	**Date of first insertion:**
Company Full Name:	**Company Full Name - English:**
Registration number:	**Legal framework:**
Nickname English:	*Nickname Arabic:*
Capital:	**Establishment date:**
Number of shares (Total):	*Number of shareholders:*

Contact persons:

Contact person: (occurrence 0-n)

Name:	*Phone number:*
Position of contact person:	

Identifications:

Identification (Occurrence: 1-n):

Id type:	**Id number:**

Date of Id issuance: *Location of the Id issuance:*

Expiration date:

Addresses:

Address: (Occurrence: 1-n)

Address type: **Country:**

State: **Province:**

City: *Area:*

Street / Block: *Postal code:*

P.O. Box: *House number:*

Contacts:(Occurrence: 0-1)

Contact (Occurrence: 0-n):

Contact type: **Contact value:**

HISTORICAL SUBJECT DATA (Occurrence 0-1)

Company information:

Company Full Name: (Occurrence 0-n)   **Date of last update:**

Company Full Name - English: (Occurrence 0-n)   **Date of last update:**

Identifications:(Occurrence: 0-1)

Identification data (Occurrence: 0-n):

Id type: **Id number:**

Date of Id issuance: **Location of the Id issuance:**

Expiration date: **Date of last update:**

Addresses:(Occurrence: 0-1)

Address: (Occurrence: 0-n)

Address type: **Country:**

State: **Province:**

City: *Area:*

Street / Block: *Postal code:*

P.O. Box: *House number:*

                                                      Date of last update:

Contacts:(Occurrence: 0-1)

Contact (Occurrence: 0-n):

Contact type: **Contact value:**

NEGATIVE STATUSES

Sections: Negative statuses, Number of inquiries, Relations to subjects, Summary imformation about contracts, Detailed information about contracts are the same as in the Individual report

APPENDIX (K)

Advanced Credit report for Organization

CREDIT BUREAU CENTRAL BANK OF SUDAN

ADVANCED ORGANIZATION CREDIT REPORT

CURRENT SUBJECT DATA

Organization information:

CSOB Code: **Date of last update:**

Nationality: **Date of first insertion:**

Organization Full Name: **Organization Full Name - English:**

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Accreditied party: **Establishment date:**

OrganizationType: *Number of shareholders:*

Number of shares (Total):

Contact persons:

Contact person: (occurrence 0-n)

Name: *Phone number:*

Position of contact person:

Addresses:

Address: (Occurrence: 1-n)

Address type: **Country:**

State: **Province:**

City: *Area:*

Street / Block: *Postal code:*

P.O. Box: *House number:*

Contacts:(Occurrence: 0-1)

Contact (Occurrence: 0-n):

Contact type: **Contact value:**

HISTORICAL SUBJECT DATA (Occurrence 0-1)

Company information:

Organization Full Name: (Occurrence 0-n)   **Date of last update:**

Organization Full Name - English: (Occurrence 0-n)   **Date of last update:**

Identifications:(Occurrence: 0-1)

Identification data (Occurrence: 0-n):

Id type: **Id number:**

Date of Id issuance: **Location of the Id issuance:**

Expiration date: **Date of last update:**

Addresses:(Occurrence: 0-1)

Address: (Occurrence: 0-n)

Address type: **Country:**

State: **Province:**

City: *Area:*

Street / Block: *Postal code:*

	P.O. Box:	*House number:*
		Date of last update:

Contacts:(Occurrence: 0-1)

Contact (Occurrence: 0-n):

Contact type:	Contact value:
	Date of last update:

NEGATIVE STATUSES

Sections: Negative statuses, Number of inquiries, Relations to subjects, Summary imformation about contracts, Detailed information about contracts are the same as in the Individual report

APPENDIX (L)

All correspondence shall be addressed to the Governor

Telegraphic address: ELBANK P. O. Box 313

Khartoum

Date: 22/2/2005

Circular No. (1/2005)

Banking System Regulation and Development Department

circulars

Addressed to all Banks,

AssalamuAlaikumWarahmatullahiWabarakatuhu,

Subject: Creating risk management in commercial banks

Technologic improvement and information come with economic globalization and it help changes in banking industry which brings risks that affects banks activities. Basel II determinants come with flexible guidelines and standards for banks to apply in all its several improvements which depends on risk management, monitoring and control.

To meet global and local requirement, banks risk management improve .Further to the circularno. (3/2003) dated 11/12/2003 which specialized in banks information unit ,the circular decide to upgrade the information unit to risk management as the comings:

1-Risk management establishment:

Every bank must establish separate department which measure, limit, monitor and control bank risks. This management follows the senior department.

2-Department objectives:

It aims to achieve the followings:

- Identify risk sources.
- Measuring the potential risks.
- Determine the influence on revenues, income and assets.
- Evaluate the potential impact on banks activities.
- Planning what to do in regulation and control to minimize the impact or abolition the risk sources.

3-Risk management functions

A. Determine risks:

The management analyzes data and information by stating reports and action plans for several units and monitor it to determine and classify the risk sorts (financial risks, operational risks, market risks, liquidity and legal risks, etc…).In all banks implemented operations, activates or deals .The unit must be a central control unit coordinating with other managements as (audit department, investment& finance management, foreign relations, marketing, etc..) all that to enable the bank to make the right decision.

B. Risks measurement:

The management adopts effective tools and determines its affection on the bank with Central Bank coordination.

C. Monitoring risks:

The management monitors banks risks through monitoring system, internal auditing, corporate governance system, applications of policies& procedures and responsibility distribution in the bank also structure of periodic reports system and suggest clear policies procedures to monitor risks and make preventive procedures to stop it.

D.Control risk extent:

The management control risk extent to minimize the negative impacts to the bank through financing tools to minimize risks (financial risk mitigation techniques).

4- Department sections:

Information & data section:

It collect and provide all data and recent historical information which related to banks activities – collect data and information about work environment systems & policies and all information that affect banks activities.

Risk evaluation:

-Get the data&various information from information section.

-Analyzing different data to determine risk sorts that face the bank.

-Determine the value of various data sources.

-Coordination with the Central Bank of Sudan about measuring risks.

- Make periodic reports about evaluation results.

Control &monitoring section:

- creating system of internal report.

- Controlling the finance &currency and market risks.

- Regard of exchange various management guide existence.

- Regard of foundations, controls, internal rate, policies and Central Bank of Sudan regulations.

- Regard of measuring operational risks before every process implementation.

- Regard of recent plans and investment policies.

- Regard t of investment department of risk department decision.

-Constant evaluation of internal system control, documentation procedures and computer use control.

Banks must regard the comings:

-Regard the risk department reports which relating to operational risks or other risk that the bank may face and never making decision or implementing and process or activity that coming with any sort of risk unless the risk department written .

-Benefit from institutional control mechanism of the relation between risk department and other institutional components.

-Providing the qualified human staff and necessary aids for implementing risk department tasks, there must be a department maximum 20/6/2005.

For/ Central Bank of Sudan

AsmaaAbdelrahmanKhairy   AbdelazeezMohamedAbdelrahman

Prudential Supervision Directorate

Banking Supervision department