Global Journal of Management and Business Research
Volume 12 Issue 11 Version 1.0 July 2012
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

Credit Sales Evaluation Model for a Small Firm

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Abstract - Credit sale is the need of every small or big firm. It is really crucial for small firms to initiate credit sale to survive in competitive environment. At the same time, the selection of customers to whom goods and services can be sold on credit is also vital. In this paper, a credit control model is developed for numerically scoring the creditworthiness of existing customers for further credit sale. The model is constructed for small manufacturing firms which cannot handle the extra cost of complex methods used for credit evaluation. Such model will support small firms to rank their customers based upon certain forecasted and current sales values and accordingly deciding whether to give credit or not and how much should be given?

GJMBR-A Classification : FOR Code:150304 JEL Code: D22, C20

Strictly as per the compliance and regulations of:

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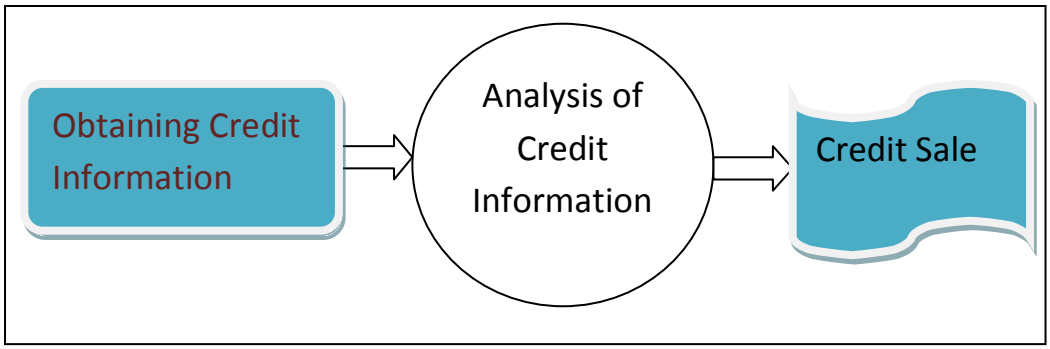
I. Introduction

Credit sale is instigated to increase sales, improve profitability, attract customers and increase market share. This is not only a trend but also a necessity in the today's competitive environment. A credit sale is as important for small as for large organizations.

Credit sales are generally treated as a marketing tool to aid the sales of goods which requires no formal acknowledgments of debt obligation through financial instruments (Khan et al 2008), but it has certain costs and risk. It necessarily involves certain future costs-like cost for collection, cost of failure to pay in time, cost of default, etc.

To overcome or reduce such costs, a firm needs to follow adequate credit policy which is neither too liberal nor too tight. Credit policy of an organization outlines its strategic and operational requirement for credit sale. It is the determination of credit standards and based on the set standards performing a credit analysis. Standards are the minimum requirements for extending credit to a customer while credit analysis involves obtaining credit information and evaluation of the applicants using certain parameters.

Figure 1 : Credit Sale Analysis



The credit information about the customer can be collected through internal sources like customer records, behavior of customer in terms of payments etc., and external sources like financial statements, bank references, trade references, credit bureau reports, etc. (Figure 1).

After collecting the credit information, the information is analyzed quantitatively and qualitatively and then a credit report is prepared of the customers to be considered for credit sale based upon the recommendations of credit manager in the report. The process is not much difficult in the case of existing customers but for a new customer, all the factors are analyzed in detail.

Another important aspect of credit policy is the period for which credit is granted i.e. the credit period. Lengthening the credit period pushes sales up by inducing existing customers to purchase more and attracting additional customers. However, the extension in credit period involves heavy cost whereas shortening of credit period would have opposite influences like lower sales, decreased investment in debtors, and reduction in bad debt loss. So deciding the appropriate credit period and trying to collect the debts (credit sales) within that period is crucial for a firm.

The credit worthiness of customer can be assessed in terms of 3Cs like Character, Capacity and Capital with the help of numerical credit scoring and several other models. A paper (Natasha et al, 2006) on Modeling customer revolving credit scoring using logistic regression, survival analysis and neural networks

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discuss credit scoring modeling of a customer revolving credit depending on customer application data and transaction behavior data.

Jae H. Min et al. (2008) proposed a DEA-based approach to credit scoring. Compared with conventional models such as multiple discriminant analysis, logistic regression analysis, and neural networks for business failure prediction, which require extra a priori information, this new approach solely requires ex-post information to calculate credit scores.

Arie Ben(2009) compares machine learning models with expert systems when applied to the same problem domain.

Steven Finlay (2009) determined the impact on performance that results from having different objectives for model construction and model assessment and empirically showed that all models perform similarly well, suggesting that modeling and business objectives are well aligned.

Nan-Chen Hsieh (2009) focused on predicting whether a credit applicant can be categorized as good, bad or borderline from information initially supplied. An Ensemble classifier is constructed by incorporating several data mining techniques, mainly involving optimal associate binning to discrete continuous values; neural network, support vector machine, and Bayesian network are used to augment the ensemble classifier

All these studies results quite scientific and mathematical models for credit scoring of customers. For a small manufacturing firm the use of such techniques is not only difficult but expensive also. Hence an economical model based on sales volume and certain forecasting techniques is developed for tiny firms.

This paper is an attempt to construct such an economical numerical credit scoring model for classifying the existing customers of a manufacturing firm into various categories. The resulted model will help in evaluating the performance of customers. It will also support the credit managers of manufacturing firms to take a decision whether to sell their goods and services on credit to a specified customer or not. This model will assist in assessing the credit limit which can be granted to an individual customer.

II. Credit Rating Model For A Manufacturing Concern

a) Purpose of the Model

- Providing a support to small manufacturing firms
  - o To rate credit worthiness of a customer.
  - o To analyze the risk bearing capacity of the organization through credit analysis of existing customers.
  - o To define the credit period, credit limit (monetary terms), of the various customers.
  - o Management of the funds, keeping in view the fund requirement of the organization and the cost of capital required in funding the creditors.

b) Methodology for Model

- A three point grading system is incorporated in categorizing the customers within different grades.
- The three points taken into consideration are
  1. Sales Volume.
  2. Timely return by the customer of the credit given.
  3. The period for which the customer requires credit.
- The grading of the customers will be done accordingly.
- The future sales with the same customers will be predicted and thus the Credit Limit of the customers will be decided using the formula (equation 1).
- Here Multiplying Factor is the ratio of the predicted Future sales to the Current Sales for the period considered under analysis. The future sales are estimated based on past sales data.
- The model can be examplified with the help of given illustration. (Table 1).
- Illustration (Table 1).

Suppose a company XYZ Ltd. has following details for sales and credit period- Table 1

Customers	Sales (Rs. Lacs)				Average Sales (4 Months)	Estimated Average Sales* (4 months)	Multiplying Factor
	Jan	Feb	Mar	April			
ABC	100	140	130	150	130	186*	1.430769
DAC	150	140	150	150	148	152*	1.027027
CAG	140	160	180	100	145	105*	0.724138
*The average future sales is based upon estimated future sales of the company based upon past data using Ms-excel sheet.(Annexure 1)							

Here two cases can be analyzed. One, if company has the policy of providing equal credit period all its customers irrespective of the sales volume. Second, the company has decided different credit period for different customers based upon sales volume or other qualitative factors. The average sale is assumed for the period of four months.

III. Assumptions of The Model

1. Past sales are the best estimator of future sales.
2. There are no taxes considered.
3. The credit limit is needed to be defined and is separate policy of individual organization.

The concern should be able to identify its customer's credit worthiness.

5. The illustrations are based on randomly generated numbers.

Case 1 : If the company has a policy of 2 months similar credit period for all customers, the result will be according to following table (Table 2).

Table 2 : Details of Party-wise Credit Rating and Proposed Credit Limit (Rs Lacs)- Case 1

S.no.	Customer Name	Customer no.	Segment	Multiplying Factor	Credit limit	Category
1	ABC Ltd.	456	OEM	1.430769	372	A
2	DAC Ltd.	457	OEM	1.027027	304	B
3	CAG Ltd.	458	OEM/EPC	0.724138	210	C

Case 2 : Suppose the Company has decided 15 days credit for customer ABC Ltd., 2 months Credit for DAC Ltd. and 3 months credit to CAG Ltd. based upon some customer relationship feedback. The results will be according to table 3.

Table 3 : Details of Party-wise Credit Rating and Proposed Credit Limit (Rs Lacs)- Case 2

S.no.	Customer Name	Customer no.	Segment	Multiplying Factor	Credit limit	Category
1	ABC Ltd.	456	OEM	1.430769	93	C
2	DAC Ltd.	457	OEM	1.027027	303	B
3	CAG Ltd.	458	OEM/EPC	0.724138	315	A

The customer name and customer number is assumed as specified in the books of accounts. Customer segment represents the OEM (Original Equipment Manufacturer) or EPC or OEM/EPC category. The result shows that if the credit limit can be reduced by tightening the credit period and it can be increased by expansion of credit period.

IV. Advantages Of Credit Control Model

- The developed model is highly suitable for a manufacturing firm for rating its customers.
- This can be a less expensive method to rate the customers' credit worthiness instead of getting it done from external agency.
- The credit control model helps to decide the credit terms that shall be abided to while dealing with the various parties.
- Limitations of the Model
- The future sales is an estimation based upon past data, here better technique for estimation can be utilized.
- The model serves the purpose for manufacturing concerns only and unable to rate the customers of a service industry.
- The model is only suitable for existing customers and not suitable for new customers for the concern.

V. Conclusion And Suggestions

Effective credit control is a vital part of maintaining a healthy cash flow. Good credit management runs through the whole business from sale to the collection of payments. Hence it is recommended to have separate cell or department for resolution of queries or disputes and smooth relation building with customers.

Besides quantitative analysis, the qualitative analysis should also be the vital part of the credit policy. As some customers may have good relationship with owner or company personnel but they may be very poor based on quantitative analysis or some customers may be of bad quality based on credit rating but may have high trade prospects.

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Annexure 1

Months\Customers	Abc	Dac	Cag
Jan	100	150	140
Feb	140	140	160
Mar	130	150	180
Apr	150	150	100
May	165*	150*	120*
Jun	179*	151*	110*
Jul	193*	152*	100*
Aug	207*	153*	90*
Average Sale For May To Aug	186	151.5	105
Average Sale For Jan To April	130	147.5	145
Multiplying Factor	1.430769	1.027119	0.724138