



CREDIT RISK ASSESSMENT OF PAYMENT GATEWAY LOANS FOR WORKING CAPITAL FUNDING OF E-COMMERCE INDUSTRY

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ABSTRACT

Credit risk assessment plays a very important role in the loan process one of the major problems that an e-commerce industry may face is the lack of capital because of very low credit rating and lack of collateral, in current scenario working capital loan applications are accepted through online mode by banks, since these loans are collateral free there is high credit risk attached to it. This paper proposes a new product that is payment gateway loan and uses data of payment gateway transactions for credit appraisal and credit scoring framework along with the potential influence that a payment gateway loan may have on the bank and financial institutions risk management

Keywords: Credit Risk, Working Capital, E-Commerce, Payment Gateway Transaction Data, Working Capital, Risk Management.

Introduction

Nowadays people prefer to buy the goods and services online due to the benefits attached to it like convenience and easiness, wide offering of products, hence to receive funds of the sale done through the online mode requires payment gateway, it is an e-commerce application service provider, some researcher says that payment gateway used to facilitate E-commerce transactions and also help to improve risk management. [1]

One of the major hindrance that any business may face is the availability of finance [2], in order to address this issue there is need of new financial products, payment gateway loan is one of such new financial product which may provide short-term working capital to the e-commerce business, when it comes to funding there is always a credit risk attached to it, so its very challenging to access the credit risk through the transaction records which were acquired from the transactions of payment gateway

Various credit risk assessment models are as follows:

1. Altman proposed z-score model in 1968, it is used for prediction of defaults and vigilance of operations based on financial ratio.[3]
2. Altman, Haldeman and Narayannan improved the z score model by adding more financial ratios, which makes it suitable for various kinds of industries and was named as ZETA model.[4]
3. Martin in 1980 used logistic regression method which include considering financial model along with different risk preference.[5]
4. J Ohlson probabilistic regression which states that the firm size, capital structure and performance liquidity does expose the firm to a financial difficulties.[6]

5. K.Y Tam and M.Y.Kiang in 1992 and Coats and Fants in 1993 used the neural network approach to predict bank failure.[7]

Most of the the above mentioned methods depends upon significant financial ratio which may be gathered from the financial reports, however new and small business does not prepare the full formal reports as compared to other big enterprise so above model will not be applicable, in this situation bank can use transaction records which may give the clear picture of solvency of the firm, this paper aims to find out how transaction records can help to access the credit risk of the firm using payment gateway data. and extending short-term credit to them by considering transaction records as a substitute to collateral.

Definition of Payment gateway loans

"The short-term loans offered to the customer who holds a payment gateway in its names is called as the payment gateway loan"

Types of transactions in the payment gateway:

Authorize - This is called as an authorization to charge, but it does not capture the funds.

Capture- This is a capture of a previous authorization. Only payments that are in an "Authorized" stage can be captured. Once a capture is completed, the authorization is closed.

Authorize / Capture or Sale - This completes the authorization and capture in one step.

Void - This is called as an Authorization Reversal. Only a payment that is "Authorized" can be voided. A void cancels the authorization. A payment that has been fully captured cannot be voided, it must be refunded instead.

Partial Capture - This transaction is called "Multiple Capture". it means that a merchant can capture more than one time on a single authorization

Refund - This transaction related to the refunding of the entire amount of a transaction. Only payments that have been captured can be refunded.

Partial Refund - This is refunding part of the transaction. partial refunds can be issued only when the refunds do not exceed the total amount captured.

How payment gateway works:

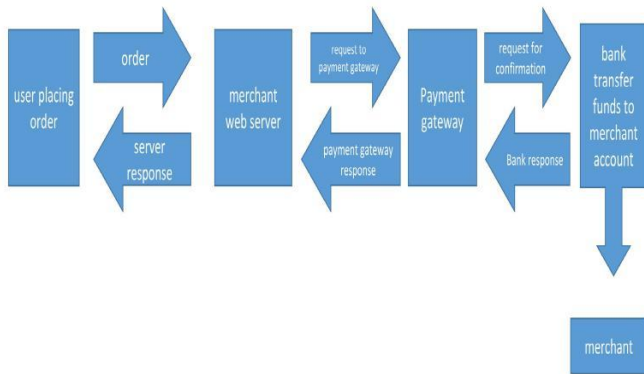


Figure 1: Payment gateway process

The step by step process:

1. User place the order in merchant website and enter the card details.
2. Order placed by user reach merchant server which then forward the details to the payment gateway.
4. Payment gateway forward the transaction information to payment processor.
5. Payment processor forwards the transaction information to the card association these association then route the transaction to card issuing bank.
6. Card issuing bank receives the authorization request and check for credit or debit and send the response back to the processor with a response code.
8. The processor forwards the authorization response to the payment gateway.
9. The payment gateway receives the response, and forwards it to merchant website.
10. The merchant submits all their approved authorizations to the acquiring bank at the end of the day for settlement
12. The acquiring bank send the request for settlement to issuer of credit card.
13. The credit card issuer makes a settlement payment to the acquiring bank.
14. The acquiring bank deposit the total amount to the merchant account

Credit Risk Assessment based on payment

gateway data

Loan approval process:

1. Every applicant must adhere to KYC(know your customer) norms of banks and financial institution which include sharing basic information along with all other legal documents like business license, certificate of registration etc.
2. The enterprise must have used a Payment gateway for more than one year.
3. Transaction records can be considered a replacement for cash flow sheets.
4. Banks could use Payment gateway transaction data to calculate the repayment capability.
5. Collateral is a necessity for applying a conventional corporate loan. But in a Payment gateway loans loan, collateral can be optional.

On the basis of the basic information, Payment gateway data, and collateral (if any), banks will assess the credit risk of the SME.

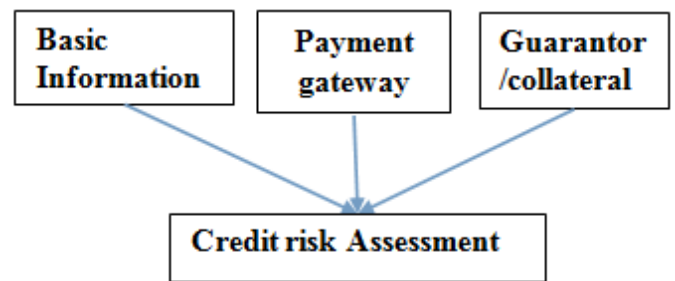


Figure 2: Credit risk assessment using payment gateway loan data

Credit Scoring System

This system can help bank and financial institution to determine how much capability does an e-commerce business have to repay the loan based on the recorded data, it also helps to produce credit scores.

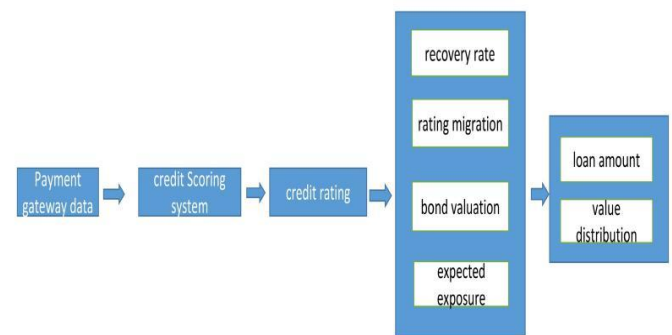


Figure 3: Framework of credit scoring system

Data is collected from the enterprise which owns the payment gateway and this data is integrated into credit scoring model

This data is stored in private cloud for further analysis.

After the complex calculations, the credit scores are generated

Using credit metrics models[8] we can calculate the correct loan amount to be disbursed.

In next step, we will use Z score model to calculate the credit rating [3]

$$Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 0.999X5$$

X1= Working capital / Total assets.

X2= Retained earnings / Total assets.

X3= Earnings before interest and taxes (EBIT)/ Total assets.

X4= Market value of equity / Book value of total liabilities.

X5= Sales/ Total Assets.

	Failed	Zone of ignorance	Non-fail
Z-score	Z<1.8	1.8<=Z<2.99	Z>2.99

In this formula, the working capital retained earnings, EBIT and sales can be provided and proven by payment gateway data.

Impact of payment gateway loans in risk management of banks and financial institutions

It is obvious that such type of new product will have an impact on the risk management of the bank and financial institution, Generally, Banks and financial institutions who are dealing in money has to cope up with four types of risks namely market risk, credit risk, operational risk and performance risk[9]. changes in any of the risk factor may affect the overall risk management function of the bank.



Figure 4: Research framework of influence on bank risk management

The Payment gateway loans will obviously result in the change of the traditional loan process which a bank or financial institution follows this will lead to major changes in operational risk meanwhile the credit risk will be affected by the portfolio credit distribution, data gathered from the payment gateway will be used calculate the portfolio credit distribution. about the market risk, information captured from payment gateway will help the banks and financial institution to gather data such as the interest rate, market volatility, and price level. All these could be very useful for banks and financial institution to

make various predictions.

To study the impact on risk management banks and financial institution need to collect a lot of data which will include application turnaround time, market volatility, the value of the loan, the rate of default etc.

All this data will be helpful to calculate the efficiency of Payment gateway loans process. Moreover, the data will also be helpful in calculating credit risk by using various models like credit risk + [10]. Payment gateway transaction can provide all the applicants' profit/loss data and price information of the whole market, which can be used for banks to measure the market risk. Therefore we can say that Payment gateway loans will bring remarkable changes to various aspects of bank and financial institutions risk management.

Discussion

This is a very innovative product which provides convenience to both customers as well as the bank in terms of easiness of loan application as well as loan approval process, however, the credit scoring of such loans requires huge data and can be fitted into big data scoring model for the credit risk assessment to gather the required information

With the diffusion of the Payment gateway loans technique, the increasing amount of financial records and data information generated by Payment gateway requires server with huge capacity that most traditional servers cannot provide. To satisfy the requirement of capacity, a cloud-based structure may be a good choice.

To examine the qualification of one borrower, the banks need data from the whole industry as well as the borrower's transaction data. The transaction data collected from different industry may be in different formats because data heterogeneity is one of the unique characteristics of Payment gateway loans data. Moreover, mining Payment gateway data could also help banks monitor cash flow and track loans.

This paper proposes a new financial product ie. Payment gateway loan and gives overview of its credit risk assessment, it also defines the payment gateway loan and explains how the data gathered for the transaction of payment gateway will be helpful for bank and financial institutions to assess the risk that they may face in due course, in further study of this research paper the researcher can evaluate the framework by conducting empirical study

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