

Project Dissertation Report on
“P2P LENDING – INTEREST RATES AND DEFAULT RISK”

Submitted by:

Priyanka Gupta

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Under the Guidance of:

Dr. Sonal Thukral (DSM, DTU)



DELHI SCHOOL OF MANAGEMENT DELHI

TECHNOLOGICAL UNIVERSITY

Bawana Road, New Delhi 110042

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CERTIFICATE FROM THE INSTITUTE

This is to certify that the Project Report titled “P2P Lending – Interest Rates and Default Risk” is a bonafide work carried out by Ms. Priyanka Gupta of MBA 2019-21 and submitted to Delhi School of Management, Delhi Technological University, Bawana Road, Delhi – 110042 in partial fulfillment of the required for the award of the degree of Master of Business Administration.

Signature of Guide

Dr. Sonal Thukral

Signature of Head (DSM)

Dr. Archana Singh

Seal of Head

Place:

Date:

DECLARATION

I, Priyanka Gupta, Student of MBA 2019-21 of Delhi School of Management, Delhi Technological University, Bawana Road , Delhi-110042 declare that Major Project Report on **“P2P Lending – Interest Rates and Default Risk”** Submitted in fulfillment of Degree of Masters of Business Administration is the original work conducted by me.

The Information and data given in the report is the authentic to the best of my knowledge. This report is not being submitted to any other university for award of anyother Degree, Diploma and Fellowship.

Priyanka Gupta

Place:

Delhi

Date: 15th/ May/ 2021

ACKNOWLEDGEMENT

It gives me immense pleasure to introduce my project report work entitled on ‘**P2P Lending – Interest Rates and Default Risk**’.

I take this opportunity to express my gratitude to all those who helped me in completion of my project report successfully. I am grateful to my project guide (Dr. Sonal Thukral) in university, for giving me the opportunity and helping me for completion of my project report and giving their valuable time.

EXECUTIVE SUMMARY

Desperate times call for desperate measures. As technology continues to emerge bigger and better, it has also changed the way we book flights, or a taxi, or search for a hotel room outside, fintech continues to make massive transformation in the way flow of money and settlements of transactions happen. With the prevalent financial crisis in India during 2008, alternative finance industry started taking shape. In the fast-changing landscape of Fintech, Peer to Peer (P2P) lending platforms has become a subject of interest as well as importance because of the unique characteristics of this method of intermediation. P2P lending is a form of crowd funding where loans are sought through the various mediums of platforms from which people are willing to lend and borrow. These platforms act as a market place for borrowers and lenders in the virtual world and hence can be called a virtual marketplace. This advanced way of loaning caters to various individuals and small businesses by searching lenders within a time frame, without the need to provide collateral for obtaining loans. Self-employed persons, contract employees, persons with no regular jobs and borrowers with some black marks in their credit history may well be able to find lenders in the peer to peer lending space. Most of these loan seekers usually find it difficult to get loans from banks. In addition to this these platforms also enable consumers in the personal loan segment and petty businesses to borrow loans through them. P2P lending and crowdfunding have a few other names, including social finance, marketplace finance, and disintermediated finance. None of these terms and conditions are alone a prima facie description of peer-to-peer lending; P2P is indeed a bigger term indicating disintermediation of consumer finance using a social marketplace virtually.

Alternative finance refers to financial channels, processes, and instruments that have emerged outside of the traditional finance system including regulated banks and capital markets. Crowdfunding and peer to peer lending are at the vanguard of this movement. The basic rationale behind emergence of this industry was removal of middlemen from the whole process of investment transaction, thereby reducing the cost and creating an online marketplace for the interested and potential investors and borrowers. This industry even includes the innovative and technical online instruments like cryptocurrencies such as Bitcoin, SME mini-bond and other shadow banking mechanisms. Crowdfunding platforms including the P2P Lending platforms in India emerged in around 2010. The number of these platforms grew without much regulatory and institutional oversight, which was encouraged also, by the general growth

of the apparent digital economy. In 2017, according to a survey the number of online platforms were estimated to be close to 50 and the outstanding loans sanctioned through P2P platforms was estimated to have reached more than 60 crore rupees (Care Ratings, 2017). While we study about these platforms and the industry, we also need to focus on how it will be affecting the finance industry both banking and non-banking in the future. While there will be a new way of determining interest rates for these platforms, the risk and credit assessing methods will also see a new horizon for its determination. We cannot oversee the fact that traditional methods of lending have been solving the financial problems of the masses for long, hence to ensure the trust of the investors and continued service to those in need a careful analysis of both these factors are required and this paper therefore consists of two parts the first one dealing with the interest rates and what affects these rates in an alternate finance industry and the second one dealing with the credit risk that the investors face from the borrowers as there is no middlemen or any form of collateral involved in P2P lending cycle.

This paper aims to analyse the factors affecting interest rates and the credit risk that the investors face while investing. This has been done by a regression and correlation analysis on various variables identified during the study and observation of the data available on the P2P lending online websites and platforms, providing the service.

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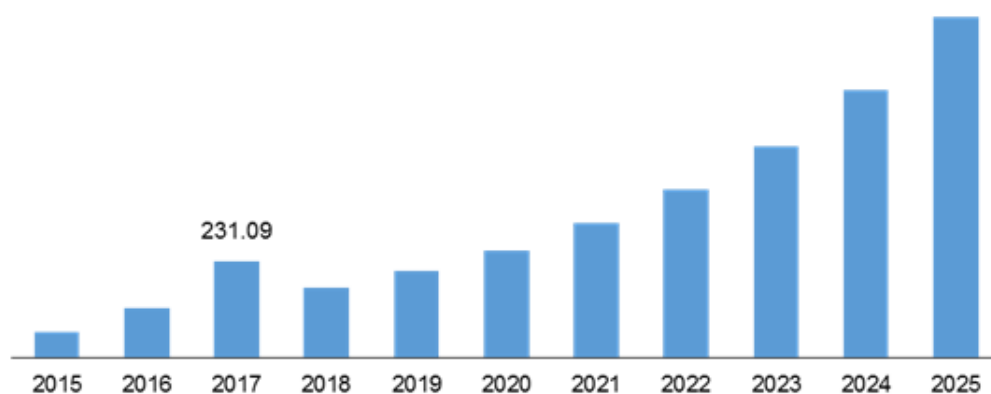
1. Introduction

P2P network lending is not a traditional kind of Internet banking, but it's a way to speed up the growth of traditional finance by allowing people to share the financial process virtually, at the comfort of their homes and just a click away but such perceived convenience doesn't come easy, not without risk. The P2P Lending is a form of crowdfunding, which has been now for some time known to intermediate funds between the borrowers and the investors without middlemen. This removal of middlemen or its substitution by online platforms has proved to be fruitful in creating an online marketplace for exchange and transaction of funds between those who have excess of funds and looking for a capital appreciation to those who require funds to meet their needs. Finance, as the core of modern economy, supports economic development, and the development of sharing economy cannot be separated from the development of sharing finance. The current economy is in a downturn; however, the money supply has increased; though, there are still many financial needs that cannot be met; clearly, there is a mismatch. To fundamentally resolve this situation, it is necessary to integrate the resources and then share, so financial exploration sharing also emerged. The traditional financial system is incompatible with the concept of sharing financial resources. Financial resources in China face serious structural imbalances, P2P network lending industry powered by Internet technology, and ship data technology. The P2P network lending industry plays an important role in meeting the financial needs of small and micro enterprises, improving the efficiency of financial resource allocation, guiding private lending toward standardisation, and other aspects, but it also plays a significant role in the realisation of financial sharing. In the fast-changing landscape of Fin-tech, Peer to Peer (P2P) lending platforms has become a subject of interest because of the unique characteristics of this method of intermediation. P2P lending is a form of crowd funding where loans are sought through the medium of platforms from people willing to lend. P2P lending platforms act as a market place for borrowers and lenders in the internet world.

As the core of the modern economy, finance supports the development of the economy, and the development of the sharing economy cannot be separated from shared finance. The current economy is in a bearish period, but the money supply continued to grow, but there are still many financial needs that money cannot finance. Obviously there is a disproportion. In order to fundamentally solve this situation, it is necessary to integrate resources and then share them, which is why the sharing of financial explorations also occurred. Completely in line with the idea of sharing financial resources Financial resources in China are

facing serious structural imbalances, the P2P network lending industry after Internet technology, ship data technology for navigation The P2P network lending industry To meet the financial needs of small and micro businesses, Improving the efficiency of the allocation of financial resources, aligning private loans to standardization and other aspects play an important role, but they are also very important in the realization of financial exchanges.

Global Peer to Peer (P2P) Lending Market Revenue (USD Billion)



Source: Adroit Market Research © 2019

Figure.1.

1.1. Background

The history of the alternate finance industry and its acceleration in emergence can be traced from the great depression of 2008, that's when people started losing their faith, beliefs and trust from the established financial institutions and instead started resorting to alternate choices for capital appreciation and other kinds of investments. The alternate finance industry majorly refers to the financial channels, financial processes and financial instruments and methods that have more or less emerged out of the traditional systems of finance broadly categorised as regulated banks both the normal ones and the non banking ones and the capital markets which are also regulated. If we talk about the current alternate finance instruments or the 'online marketplaces' we can say that crowdfunding, revenue-based financing, online lenders, P2P and business lending, invoice trading through the third party platforms, and the most prevalent alternate finance instruments include cryptocurrencies like bitcoin or dogecoin, community shares, social impact bonds, SME mini bond, and other shadow

banking methods and mechanisms. If we closely look at the above examples and instruments we can say that one thing that is common among all of them is – technology. Each of these differ from the regulated system of traditional finance as they have technology enabled disintermediation of funds between the stakeholders i.e instead of using a middleman they use third party sites or capital for raising funds which in turn reduces the transactional costs on both sides but also has its other advantages and disadvantages. On one side the borrowers or the fund receivers are getting collateral free and less regulated funds through these channels readily to fulfil their needs while on the other hand even though the investors are facing a risk of default, they are also getting higher interest rates as compared to the traditional channels and reduced paperwork and wait of allotment which can be treated as a trade-off for the risks taken by them. Considering these technology enabled financial services to be the future of the finance industry, a new term was coined to name this whole umbrella- Fintech. Fintech basically stands for financial technology. Originally, the term was used to refer to the back-end technology that was used in the traditional financial sector to maintain records and calculate other necessities, but since the start of the 21st century, the term has expanded to include the new technological innovations and advancements in the financial sector, such as cryptocurrencies, crowdfunding and online lending platforms. Simply put, fintech applies technology in order to improve financial activities.

Now, this paper covers the P2P lending part of the alternate finance industry. Peer-to-peer lending (P2P) is a way for investors to lend money to individuals or businesses, those who lack funds to source their needs. You - as the lender - receive interest on your investment and you get your invested amount back when the loan is repaid by the borrower. And as a borrower you get funds readily available at the click of a button, though there are a number of personal details and information required before signing up, but the loan is also available collateral free depending upon the trustability of the borrower that he/she will pay both the interest and the principle amount to the investor without causing much delays. But P2P lending can be a much riskier business than a savings account which is a part of the traditional finance industry. From the lender's perspective, the risk of online P2P lending may be divided into two parts: one is the potential risk of the lending platform, and the other is the risk of borrower default. This paper covers both the aspects of the P2P Lending – Interest Rates and the risk of defaults.

1.2. Problem Statement

Through this paper we aim to achieve a dual purpose of –

1. *Finding what are the factors affecting interest rates in this alternate finance industry – P2P Lending.*

We know when it comes to the traditional finance industry, there are a number of fixed factors that affect the interest rates in the market for credit, like the inflation rates, demand and supply of a particular type of credit like home loans or travel loans, the condition of the economy and other factors integral to the bank or the institution, we are looking forward to draw the loan from but in the case of P2P Lending since it is a newer industry, not much studies have been there to understand the structure, extent and the types of factors that are responsible to come down at a particular interest rate for the loan.

2. *What kind of risk of default do the investors face?*

The P2P industry is relatively new, though we know that there exists a risk of default in both the regulated marketplaces as well as the unregulated ones but it is important to assess what kind of default rate risk this industry constitutes. As P2P lending is a collateral free method of obtaining funds through the online marketplace, there is a risk for investors to invest in such an instrument, due to lack of guarantees and proper background checks there is a high risk that the borrowers may flee away without paying off the debt or the amount borrowed and hence there is a need to assess that how much risk is involved and what is the perception of such an instrument in the eyes of the public as well as the direct stakeholders involved in the transaction. The P2P network lending industry offers inclusive finance services. The main target of their services are small businesses, and some of the low-income people cannot get loans from banks. In addition, our country's credit system is not very perfect. Many platforms rely on the borrower to provide their own information, or on the transaction record platform, to determine the credit situation as incorrect information cannot make a correct judgment. And the P2P platform cannot track every borrower using the loan funds. This will undoubtedly increase the likelihood that the

borrower's overdue loans, large numbers of overdue loans, and bad debts will pose a major threat to the safety of investor funds.

1.3. Objectives

The objectives of the study are divided into two parts which are as follows-

1. To analyse factors that are responsible for determining the interest rates. For this various variables both dependent and independent have been identified and listed in the further study.
2. To analyse the extent of these factors affecting the interest rates in this industry and it's dependency on these factors. For this various methods of linear regression have been used to identify the relation between the factors and the interest rates.
3. To analyse the working of P2P lending and it's various platforms, and factors affecting both the borrowers and the lenders.
4. To analyse the risk of default faced by the investors in P2P lending and factors affecting it.

1.4. Scope

In the past decade, P2P lending networks and platforms have seen explosive growth. As more and more problems emerged, the end of 2015, P2P regulations officially landed and resulted in the industry gradually entering the mature stage of development. The arrival of financial sharing means that financial activities are becoming more and more transparent and that the financial consumer becomes active, which means that unused resources must be strengthened. This is certainly an opportunity for the P2P network lending industry that has embarked on a mature development path. The P2P lending process starts with loan applications from borrowers. When applying for a loan, borrowers provide information about the purpose of the loan, the amount

requested, the interest they are willing to pay, and their personal and financial information. Borrowers' Information available are then processed through underwritings to the loan platform. After approval by the credit platform, loan applications are allocated to a loan pool and then listed on the market so that investors can bid. Investors select a loan offer from the list and make decisions about the amount to invest in the loan offer. The loan will then be made available to a borrower when the loan amount is fully funded or has attracted enough offers to finance.

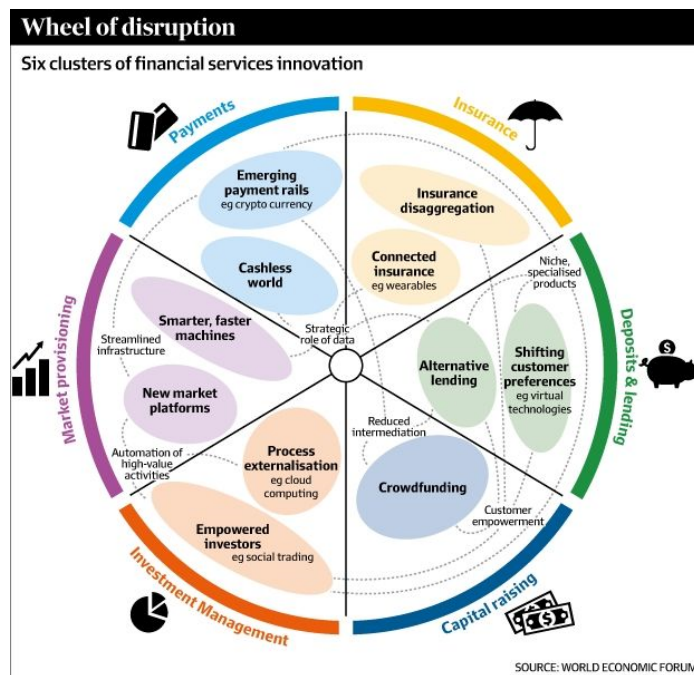


Figure.2.

Online financial platforms and P2P lending sites are a suitable alternative to more traditional banking systems as they are a relatively powerful investment channel and a conduit for obtaining credit on favourable terms. At the same time, companies in the industry must act to increase legitimacy and reduce risk awareness. It is evident that the P2P lending industry suffers from a lack of awareness of its existence, as well as a lack of knowledge of the activity and risk involved in granting social loans. Alternative to the institutionalized banking system in public who are interested in easy loans and attractive investments. At the same time, they must increase their own legitimacy by countering fears of economic risk, for example through a security fund that enables financial repayment if borrowers fail to meet their obligations.

2. Literature Review.

This paper focuses on the peer to peer lending aspect of this newly emerged industry and aims to identify the factors responsible to establish a clear ground for the interest rates. Since interest rates are a determining factor in this online marketplace, it plays a key role for both the investors and the borrowers to narrow down on one deal. While investors are looking for higher return on investments in minimum stipulated time, borrowers are looking for quick and easy loans to fulfil their requirements and sometimes might not even shy away from paying high cost of credit for it. Therefore this paper evaluates the lending rate on various parameters available to the customer while entering into a transaction.

Considering the Indian scenario on peer to peer lending, it's still in its infant stage with its worth at about \$3.2 million, however the estimated P2P lending over the next 5 years stand around \$4-\$5 billion. The developed world economies have a far better standing in this industry with respect to India - The P2P industry in US stood at around \$20 billion in 2016, and in the UK around \$3.5 billion at the end of the third quarter of 2017. China has the biggest P2P market in the world, wherein, their outstanding P2P loans stood at around \$67 billion as of January 2017 (CARE Ratings, 2017). China, with their lending book standing at \$100 Billion and over 2000 lending platforms. India, on the other hand has about 30 P2P platforms online out of which only 11 platforms have received the NBFC-P2P certification from the RBI (Singh, 2019).

In general, the empirical evidence indicates that there is indeed a positive association between the degree of development of the financial sector, including in particular freer interest rates, and economic performance in developing countries. This finding has undoubtedly prompted the authorities in a number of such countries to pursue policies to remove controls on interest rates and to allow market forces to play a relatively greater role in the determination of interest rates (Sebastian, 2015). In fact this paper aims to identify such prevalent factors impacting the determination of interest rates in this alternate finance industry.

As the marketplace lending industry gains its size, it obviously became the target for regulatory attention. There have been arguments that the growth of P2P lending will weaken financial stability, since regulators will find it difficult to monitor a largely dispersed base of lenders or lending platforms. There are issues of frauds, causing wide-spread losses. Additionally, the platforms, with

little skin in the game but with impressive data of high returns and low defaults in the past, may attract lenders thereby reducing underwriting standards, promoting lax lending, and so on (Vinod Khatri, 2019). With the RBI coming out with the P2P Master Directions in October 2017, the industry has a formally recognized legal framework, and no longer needs to operate in a regulatory grey area. There is now a definite set of guidelines and regulations that govern this industry. RBI has officially classified them as NBFC-P2P. Some of the major norms of these guidelines are – mandatory certification, no holding and lending funds on its balance sheet, maximum lending limit is Rs 10 lakhs from one lender, maximum borrowing limit Rs 10 lakhs and exposure of single lender to a borrower should be limited to Rs 50,000, also 36 months is the maximum loan tenure allowed by RBI (RBI, 2017).

2.1 Functioning of P2P Lending

The current functioning platforms of p2p lending in India, to name a few include - Faircent, i2i funding, Finzy, Peerlend, LenDenClub, Paisadukaan, LiquiLoans and AnyTimeLoan.in – all of these has also received the RBI licenses. The current size each of these clubbed together forms about Rs. 200 Crore, with an increasing growth rate. However the functioning of a p2p platform can be understood with a small mechanism.

It is a technology-oriented platform where borrowers can get connected to the lenders. If both the parties are get agreed with basic needs to an interest rate and the loan amount. Then only they enter into the contract which as of now is being facilitated by an online platform or a website. The borrower pays back the amount in the form of EMI's (Equated Monthly Investments) to the lender. Due to this functioning of such platforms and creating like a parallel financial industry, all P2P platforms will now be considered as non-banking financial companies and regulated by the RBI. This model can provide the benefit to lenders as well as to the Borrower (Hanumant, 2020).

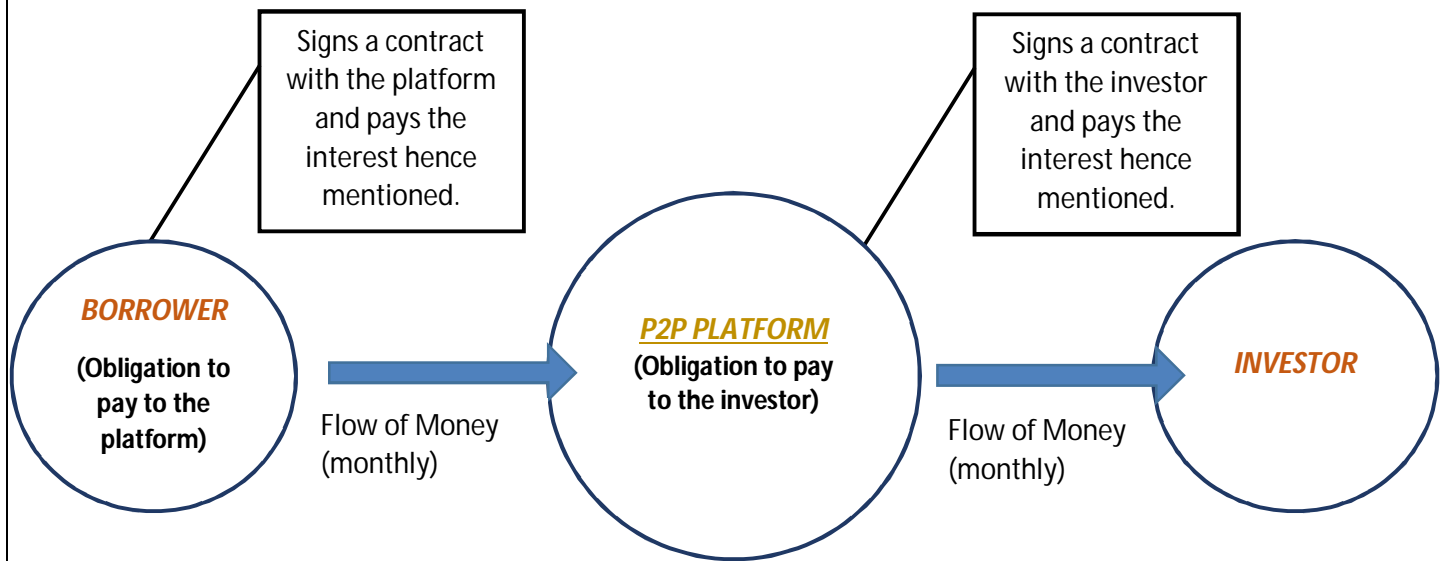


Figure.3.

The lending process in this mode includes a separate contract for both the investors and the borrowers that they have to enter into before registering as a potential investor/borrower and after furnishing the required details with proofs and paying a small orientation fees to the platform for facilitating the transaction. The interest rates are in some cases decided by the platform or could be decided mutually by the parties. Importantly, the routing of the money and well as individual loan contracts is directly transacted between the borrower and the lender, and the same is only monitored through the platform. Once the contract is signed by both the parties, investors can see the borrower's details on the platform and can enter into a deal if they find it lucrative and profitable in the definite time thus mentioned.

Through this mechanism we can infer that since 90% transactions are in cash, India is among the world's biggest peer-to-peer (P2P) offline lending markets, crowdfunding, and Micro Finance Institutions (MFIs) online such as Bandhan, SKS, Milaap, RangDe, and Faircent have had tremendous success and impact by bridging the upper class market with the lower middle class and vulnerable population (Maneesh Bhandari, 2016)

An examination of the loans advertised and listed on the websites of peer to Peer lending platforms (i2i funding and ilend) show that the loans are predominantly personal loans for purchasing a specific product or to finance

an education usually over a period of 12-24 months. Due to this P2P lending platforms generally require borrowers to make over post-dated cheques to them so that they get a legal standing in the loan. In case of default in payment, the platform would attempt to encash the cheque in their possession and initiate action for recovery (Craig Nichols, 1905).

2.2. Interest Rates

The interest rates are basically the amount charged on top of the principal lent by a lender to a borrower for the use of his/her assets. We can essentially also consider it as a rental or leasing charge to the borrower for the use of an asset. In case of the industry in question, this rental is being charged by the investors to the borrowers in exchange of the money being used by them with no collateral involvement, just the credit worthiness and the requirement of the borrower. Also usually in the traditional finance industry when the borrower is considered to be low risk by the lender, the borrower will usually be charged a lower interest rate. If the borrower is considered high risk, the interest rate that they are charged will be higher. Risk is typically assessed when a lender looks at a potential borrower's credit score, which is why it's important to have an excellent one if you want to qualify for the best loans. However it might not be a situation for the P2P lending platforms, which we may see ahead in the paper. For loans, the interest rate is applied to the principal, which is the amount of the loan. The interest rate is also known as the 'cost of debt' for the borrower and the 'rate of return' for the lender. As the borrower pays the lender a premium for using his services for a particular period of time, which makes the investor entitled to some kind of return, which is monetary in this case. Even though the P2P portals are open to anybody who needs money, these mainly attract people of low-income groups or with low CIBIL score who have no other alternative to get loans. However, the final decision to lend rests with the lender which can either be an individual or an institution.

In addition to this, keeping in mind a few factors, various websites charge different types of interest rates, while categorising each loan on the basis of purpose, amount, employment type, risk category and then presenting it to the borrowers and lender, a few of the websites' data have been collected and presented in the following table –

Name of the P2P Platform	Interest Rate (p.a.)	Loan Amount	Repayment Tenure	Listing/Registration Fee
Lendbox	12% onwards	Rs.25,000 to Rs.5 lakh	6 months to 24 months	Rs.500
i2ifunding	12% onwards	Up to Rs. 10 lakhs	3 months to 36 months	Rs.100 plus 18% GST = Rs.118
Faircent	9.99% onwards	Rs.10,000 to Rs.5 lakh	6 months to 36 months	Rs.500
OMLP2P	10.99% onwards	Rs.25,000 to Rs.10 lakh	3 months and 36 months	Rs.100
i-lend	15% onwards	Rs.25,000 to Rs.5 lakh	6 months to 36 months	-
LenDenClub	6.5% onwards	Rs.25,000 to Rs.5 lakh	3 months to 24 months	Rs.750

Table.1.

This table shows the various categories on which the interest rates depend. Similarly, this paper also considers various factors that may go into deciding the interest rates. These range from employment type to the tenure and amount of the loan required by the borrower. This paper aims to understand the severity with which each variable affects these rates in this new virtual market as we can see due to lack of collateral and easy availability, these rates are higher than the traditional ones. Online P2P lending platforms differ in type and the approach adopted. They can basically be divided into two types: commercial and non-commercial (Ashta & Assadi, 2009). A lender who engages in commercial platforms gets a reasonable interest for the risk he is taking. In non-commercial platforms lenders get no or little reward for the risks they are willing to take. Here lenders rather want to "donate" small loans

to projects in economically underdeveloped regions in the world. Some platforms connect lenders and borrowers directly while others connect them through a third-party (usually bank). Online P2P borrowing platforms differ in the way the borrower's interest rate is set. Sites, such as comfort.com, use an auction system (Galloway, 2009) where borrowers are able to set a higher interest rate they are willing to pay. Limited time (a successful auction lasts 14 days) lenders can set their bids by specifying the amount they are willing to lend and the minimum interest rate they are willing to accept. Even after a full loan, lenders can still place their bids and take out other lenders by offering low interest rates. In this case, when more bids are set than those required to finance the loan, those bids with the lowest interest rate are preferred. All lenders then earn the highest interest rate charged on their investment loans, even if the minimum interest rates on their bids are small.

Some sites, such as the German platform smava.de, calculate interest rates on loan applications, based on the characteristics of borrowers (financial and human). The bidding process ends after the loan is fully funded, as some bids will not affect the interest rate that will arise (Collier & R. Hampshire, 2010). If the borrowing process results in a fully repayable loan application, other platforms have used another loan guarantee, including a guaranteed income guarantee. The loan is then given to the borrower, who will eventually begin the repayment process (S. Garman, R. Hampshire, et al., 2008). Medium-sized P2P lending platforms generate their revenue through service fees, collected from borrowers and lenders (Klafft, 2008). Many collect a mortgage of a certain percentage of the loan backed to the borrower, as well as late repayment or failure payments. Lenders usually pay a service fee based on the amount paid by the borrowers.

2.3. Credit Risk

The p2p Lending model is characterised by the unsecured nature of loans as well as lack of rigid rules and regulations which contribute in increase of the credit risk. A credit risk is basically a risk of default on a debt that may arise from the borrower failing to make required payments. In the first resort, the risk is that of the lender and includes lost principal and interest, disruption to cash flows, and increased collection costs. The loss may be complete or partial.

Credit loans have been an essential part of the traditional as well as emerging financial industries and investors are constantly searching for better measures to minimize the credit risk associated. Credit risk is a crucial challenge and a complex task to manage and evaluate. Risk evaluation is a vital part of credit decisions and its precision has a

significant consequence on credit management. It is emphasized that credit risk evaluation is a significant issue in financial risk management that is a major concern for the financial and banking industry. The need for and the measures of credit risk evaluation have been a topic of research for quite some time now. The incapability of correctly identifying risk can adversely affect credit decisions and is a necessity in the industry in question, which can lead to investment failure. Therefore, correctly identifying credit risk is essential to secure investments. (Byanjankar, Heikkila and Mezei, 2015). P2P Lending offers its investors an attractive rate of interest keeping in mind the amount of risk they take eventually these also lead to diversification in their portfolio as we can say that even though there is transparency, the default risk or the credit risk associated with this kind of transaction cannot be ignored, justifying the higher rates. According to the data available on various websites, on an average there is 5% default risk associated with P2P lending which is not that bad and comparing this with the mortgage and asset backed securities, there is an average different of 2% return being received by the P2P lenders on and above the usual rate which hence we can say is carefully offsetting the risk involved. There are other benefits available to the investors as well, for offsetting this risk, these can be majorly two. Firstly optimized portfolio selection by evaluation of risks and returns in the platform and the mode selected, we can effectively say that this one might be of benefit to the institutional investors more as compared to the individual ones as they have an access to a number of criterions and methods for evaluation. The second one would be improved access. Since the platforms are a click away, and the information about the borrowers are readily available, we can say that the ones who are resourceful would be in a position to easily help those in need, we can alternatively also include this benefit into the categories of proximity and/or transparency (Morse, 2015).

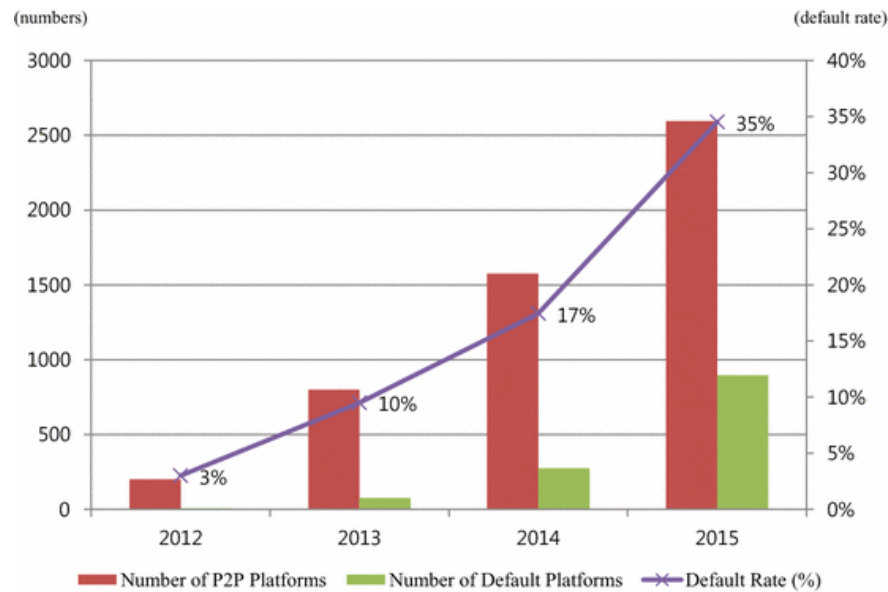


Figure.4.

According to Malhotra and Malhotra, credit scoring systems are developed using historical data available of the loans in analytical models to determine the creditworthiness of a borrower, and use the probability of default on the loan as a basis of classification. The objective of such credit scoring models is to identify certain characteristics that distinguish between good and bad credits, i.e. predicting the likelihood of customers to default with their repayments

2.4. Major Drawbacks

Considering the global scenario of P2P Lending market size was valued at \$67.93 billion in 2019, growing at a CAGR of 29.7%. The market is showing tremendous growth due to the bullish interest of the investors for high returns and of course the borrowers who are getting instant collateral free loans in return of the verification process and minimal fee paid to the intermediate platform. But along with all the glory, this sector has failed to gather much attention despite of being into existence for over a decade now into the Indian markets. Though we can say that it is still evolving from the infant stage but there are a number of other factors as well which are responsible for the lack of increasing growth of the alternate finance sector.

Due to the online nature of P2P lending, the first major issue that is faced by the participants is the existence of information asymmetry. Information asymmetry exists in every financial market in varying degrees, as explained

by Leland & Pyle (1977), borrowers cannot be expected to be fully transparent with their characteristics and details about their ventures and for lenders this brings in the problem of information asymmetry. Thus, a lender cannot know the credibility of a borrower as well as the borrower does. The issue of information asymmetry is magnified in P2P lending, due to an online landscape borrowers and lenders do not physically meet. In addition to this, traditional banking uses collateral, reporting and certified accounts to verify the credibility of the borrower, however such mechanisms are tricky to implement in the online P2P format without incurring a significant transactional cost (Emekter R. , Tu, Jirasakuldech, & Lu, 2015).

We can say that P2P platforms have lesser operational cost, lesser regulatory overheads, hence in an ideal situation, it should be bullish in the markets, but the platforms are still meddling to settle grounds because lack of visibility on the steps to address risks, coupled with a dearth of deep-pocketed lenders, keeps the cost of funds high. As described by Flanagin (2007), trust is "the perception of the degree to which an exchange partner will fulfil the transactional obligations in situations characterized by risk or uncertainty" (Flanagin, 2007). As the transactional promise between two loans is nearly identical to a lender (a promise of monthly repayment of principal with interest at a defined rate), the reason a lender will choose to fund one loan over another is presumably the perceived trustworthiness of the borrower and the belief that the borrower will fulfil their repayment obligations. As such, funding success should directly reflect the perceived trustworthiness of the loan request (Maureen Were, Joseph Wambua, 2014). In addition to this the safety and authenticity of only those platforms can be verified which are registered with RBI, but availability of numerous other websites and platforms which provide similar services cannot be authenticated and might lead to serious fraud crimes in the long run.

Lenders in P2P lending are exposed to a larger default risk owing to the lack of collateral contrary to the traditional banking system. Banks are able to better produce information relating a borrower's credit risk and can use this information to develop contracts which require riskier borrowers to pledge more collateral (Berger & Udell, 1990). Keeping everything else constant, collateral reduces the riskiness of a loan by providing specific claim on the collateralised asset to the lender (Barro, 1976). Such lending platforms offer unsecured loan facilities to borrowers and therefore are exposed to the risk which is associated with lack of collateral and the risk of moral hazard comes into the picture. When an individual is assured of safety, as in this case no security is on the line, it can lead to faulty decision making and deliberate risk

taking, and this results in the problem of moral hazard (Pauly, 1968). There is a possibility of mitigation of such moral hazard and reduction of default risk as found by Everett (2011). Existence of social relationships in microfinance affects the repayment of a loan with more connections directly relating to better repayment rates (Woolcock, 2001). In Peer to Peer lending, having personal relationships and memberships to social groups can relate to reduction of default rates and partial mitigation of the moral hazard pervasive in P2P lending (Everett, 2011).

3. Variables Used

Since the paper is divided into two parts one ascertaining the variables and the factors responsible for affecting the interest rates in this alternate finance industry and the second part dealing with the credit risk involved and ascertaining the default risk on such loans and the factors that affect such defaults on the part of borrowers, there are a number of variables involved in the study which will be analysed carefully and are listed below.

3.1. Purpose

It refers to the key reason for the borrower taking the loan. Working capital loan, education loan, personal loan, invoice loan, house renovation, marriage of relatives, buying standardised beauty kit, business expansion, car loan, short-term business loan, any medical emergency, etc are the key types of uses specified on the online P2P websites. The intention of taking out a loan indirectly affects the loan, since a given purpose increases the possibility of effective financing.

3.2. Credit Bureau Score

The score of the credit bureau will impact the lending process directly. There are three credit offices in India - CIBIL, Experian and Equifax. These agencies are responsible for preserving the financial credit history and behaviour of any Indian person. We keep a record of all the transactions taking place in each person's account. Whether it's current or past loans, issued credit cards, bank overdrafts, etc., these companies keep a watch on your every financial step.

The credit bureaus update every borrower's profile on a monthly basis, including transactions made and loan agreements made. All transactions are

equal to an individual's final credit score. Taking into account every financial transaction made by a person, the score consists of a complex algorithm.

When attempting to borrow money, maintaining a positive credit score is an extremely important aspect. The CIBIL score has a negative or positive effect on any transaction you do. This score also serves as a deciding factor, whether or not the lender is going to give the borrower a loan.

3.3. Interest Rate

The rates vary depending on the repayment capacity of the borrower and his credit history. The most significant feature of peer to peer (P2P) lending is risk profiling. A low-risk borrower will get loans at a lower interest rate, whereas a higher-risk borrower will have to pay a higher interest rate for their loan.

“Borrowers on our platform are given a score out of 100, which determines their risk profile. A score of 52 to 60 points is high risk while a borrower with more than 60 points will get a lower interest rate,” says Bhavin Patel, Founder & CEO, LenDenClub.

The risk factor linked to lending to an individual is specified by interest rates. His purpose and capacity to repay can be assessed by past repayment behaviour, his discipline in making utility payments and past loans.

The rate of interest often varies according to demographics and geography. A individual living in a remote region may have to pay more for the loan than someone with better financial exposure in a metro city.

Interest rates are set as per the profile of the borrower. The profile is defined by the financial health of the borrower, which is expressed by many factors, such as his credit background, job profile and place of employment. The platform makes the bid on the basis of the assessment. He's listed on the forum if he accepts.

The borrower's higher monthly income has a positive effect on the interest rate, although the interest rate depends on several factors. Longer periods have a negative impact on the interest rate.

3.4. Tenure

It refers to the length of the term of the loan, i.e. the period during which the lender is lending the borrower money. For P2P firms, the amount of borrowings and tenure of the loan varies. For example, borrowers can request

loan amounts ranging from Rs 25,000 to Rs 10 lakh (in multiples of Rs 5,000) on the OMLP2P platform. The minimum maturity period for the loan is 3 months, and the limit is 36 months.

Therefore, tenure directly affects the P2P lending mechanism, adversely impacting the interest rate over longer periods of time.

3.5. Employment Type

It refers to the kind of jobs in which the borrower is working. It is looked at in order to help measure the individual's credit worthiness. There are three broad categories in which a creditor, a salaried employee, a self-employed professional and a business owner are registered on the i2iFunding website. The form of employment influences the financial soundness of an entity indirectly.

3.6. Monthly Income

Monthly income refers to an individual's overall earnings, which he/she receives on a monthly basis from the job he/she does. It directly affects the lending process for P2P lending. The borrower's higher monthly income has a positive influence on the interest rate, while the borrower's lower monthly income has a negative impact.

3.7. Loan Amount

The value of the loan refers to the amount which a lender is seeking to finance the borrower. The lower the amount of the loan, the higher the likelihood that the loan will be fully repaid and vice versa.

3.8. Age

The lower age of the borrower has a positive influence on the interest rate and the category in which the borrower is placed, whereas the older the borrower has a negative impact.

3.9. Total Professional Experience

If a person has more professional experience, as it adds up to their creditworthiness and vice versa, it typically goes to his/her favour.

3.10. Documents Verified

In order to guarantee the protection of the lender's assets, P2P lending websites also verify a borrower in any possible way before registering them on their platform. Pan Card, Permanent address proof, Aadhar card, Credit bureau report, salary bank account statement, salary cheque, current address proof, reference verification, etc are the different types of documents that i2i funding verifies before registering a potential borrower on their website.

The further documents checked with the P2P site, the greater the chances of successfully funding the loan, since it has a positive effect on the profile of the applicant.

4. Sample

For part one of the study, a sample of 137 people is taken who are individual borrowers registered on a *P2P Lending platform (I2I Lending)* across various occupations and different purposes and tenures to borrow the loan.

Observations from the Dataset:

- 1) The dataset doesn't contain any anomalies.
- 2) The Dataset doesn't have any missing values.
- 3) The Dataset doesn't have any outliers.

	Credit Bureau Score	Interest Rate	Tenure	Monthly Income	Loan Amount
VARIANCE	27562.7666	7.12934735	18342.83	1945131458	10632148259
MEDIAN	634	15	90	35000	16463
MEAN	599.379562	15.4306569	152.9635	49883.13139	63467.67883

STANDARD DEVIATION	166.020380	2.67008377	135.4357	44103.6445	103112.309
MODE	300	18	90	20000	10000

Table.2.

For the second part an observation of the data set of few of the P2P lending websites was taken, it consisted of both the defaulted and the non-defaulted loans along with the various demographics of the borrowers.

5. Methodology and Results

For part one the procedure to be followed:

- 1) Encode the Categorical Data.
- 2) Split the dataset into Training set and Test Set.
- 3) Feature Scale the desired entries to normalise/standardize the ranges of independent variables or features of data.
- 4) Fit the variables in a regressor (formula: regressor => Dependent Variable ~ Independent Variable1 + Independent Variable2 + Independent Variable3 + + Independent Variable (n))
- 5) Use Backward Elimination process to remove the redundant variables and variables having very low Statistical Significance one by one.
- 6) Post Backward Elimination, obtain the desired Regressor model and then compare our findings with our Test Set to establish coherence with the Dataset.

In order to find the relationship between the interest rate and other variables, first we defined the various hypothesis and then tried to find correlation amongst each of these in isolation.

5.1. Interest Rates and Monthly Income.

First we tried to find the dependency of interest rates on monthly income of an individual borrower, whether there exists any kind of correlation between the two or not. The following hypothesis were defined for the same –

H_0 : There exists a relationship between interest rates and monthly income of a borrower.

H_1 : There doesn't exist a relationship between interest rates and monthly income of a borrower.

Correlations

		Interest Rate	Monthly Income
Interest Rate	Pearson Correlation	1	.226
	Sig. (1-tailed)		.004
	N	137	137
Monthly Income	Pearson Correlation	.226	1
	Sig. (1-tailed)	.004	
	N	137	137

Figure.5.

After getting the results from correlation testing on the sample set, we accept the null as the significance value is less than 0.05 i.e there exists a relationship between the interest rates and monthly income of the borrower and in addition to this there is a positive correlation between the two. Which means as the income of the borrower increases, the interest rate also increases and vice versa.

5.2. Interest Rates and Loan Amount.

Next we tried to find the dependency of interest rates on the loan amount demanded by an individual borrower, whether there exists any kind of correlation between the two or not. The following hypothesis were defined for the same –

H_0 : There exists a relationship between interest rates and loan amount demanded by an individual borrower.

H_1 : There doesn't exist a relationship between interest rates and loan amount demanded by an individual borrower.

Correlations

		Interest Rate	Monthly Income
Interest Rate	Pearson Correlation	1	.226
	Sig. (1-tailed)		.004
	N	137	137
Monthly Income	Pearson Correlation	.226	1
	Sig. (1-tailed)	.004	
	N	137	137

Figure.6.

After getting the results from correlation testing on the sample set, we accept the null as the significance value is less than 0.05 i.e there exists a relationship between the interest rates and loan amount demanded by the borrower and in addition to this there is a positive correlation between the two. Which means as the loan amount demanded of the borrower increases, the interest rate also increases and vice versa.

5.3. Interest Rates and Credit Bureau Score

Next we tried to find the dependency of interest rates on the credit bureau score of an individual borrower, whether there exists any kind of correlation between the two or not. The following hypothesis were defined for the same –

H₀: There exists a relationship between interest rates and credit bureau score of an individual borrower.

H₁: There doesn't exist a relationship between interest rates and credit bureau score of an individual borrower.

Correlations

		Interest Rate	Credit Bureau Score
Interest Rate	Pearson Correlation	1	-.059
	Sig. (1-tailed)		.248
	N	137	137
Credit Bureau Score	Pearson Correlation	-.059	1
	Sig. (1-tailed)	.248	
	N	137	137

Figure.7.

After getting the results from correlation testing on the sample set, we reject the null hypothesis as the significance value is greater than 0.05 i.e there exists no relationship between the interest rates and the credit bureau score of an individual borrower and in addition to this there is a negative correlation between the two.

5.4. Interest Rates and Tenure of the Loan.

Next we tried to find the dependency of interest rates on the tenure for which the loan is demanded by an individual borrower, whether there exists any kind of correlation between the two or not. The following hypothesis were defined for the same –

H_0 : *There exists a relationship between interest rates and tenure for which the loan is demanded by an individual borrower.*

H_1 : *There doesn't exist a relationship between interest rates and tenure for which the loan is demanded by an individual borrower.*

Correlations

		Interest Rate	Tenure
Interest Rate	Pearson Correlation	1	.041
	Sig. (1-tailed)		.319
	N	137	137
Tenure	Pearson Correlation	.041	1
	Sig. (1-tailed)	.319	
	N	137	137

Figure.8.

After getting the results from correlation testing on the sample set, we reject the null hypothesis as the significance value is greater than 0.05 i.e there exists no relationship between the interest rates and tenure for which the loan is demanded by an individual borrower and in addition to this there is a positive correlation between the two.

5.5 Regression Results

The analysis for multivariate regression is done using R studio the script for which can be found in the annexure.

Function Used: Call: lm(formula = Interest_Rate ~ Purpose + Employment_Type + Monthly_Income, data = training_set)					P-value
Residuals					< 2.2e-16
Min	1Q	Median	3Q	Max	
-0.07883	-0.01634	0	0.00059	0.33025	
Coefficients:					
	Estimate Std.	Error	t value	Pr(> t)	Code
(Intercept)	1.20E+01	2.88E-02	417.223	< 2e-16	***
Purpose2	3.01E+00	8.34E-02	36.126	< 2e-16	***
Purpose3	5.86E+00	9.25E-02	63.407	< 2e-16	***
Employment_Type8	1.82E-01	8.80E-02	2.066	0.04145	*
Employment_Type9	9.56E-02	1.40E-01	0.681	0.49773	
Monthly_Income	-1.26E-06	4.50E-07	-2.793	0.00626	**
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
Residual standard error: 0.1573 on 100 degrees of freedom					
Multiple R-squared: 0.996					
Adjusted R-squared: 0.996					
F-statistic: 5272 on 5 and 100 DF					

From the above results it can be interpreted that the variables enlisted are highly significant when it comes to deciding the interest rate for P2P lending dataset. The code '***', '**' and '*' depicts the significance level of the variable stated.

After applying the regression model on our dataset, we infer from the first and last regression that only Purpose, Monthly Income and Employment Type are the most statistically significant variables for determining the interest rate in the respective order. Lastly the predictions of Interest Rate from the test set were coherent with the actual dataset and varied in decimal points only.

For the next part that is dealing with the credit risk, after the careful analysis of the data available publicly on the various lending platforms, we observed that P2P lenders can reduce the risk of investment failure by selecting profitable borrowers after processing the loan applications through a rigorous training and testing model. Through the analysis, we can say that these variables have relative importance in deciding the risk

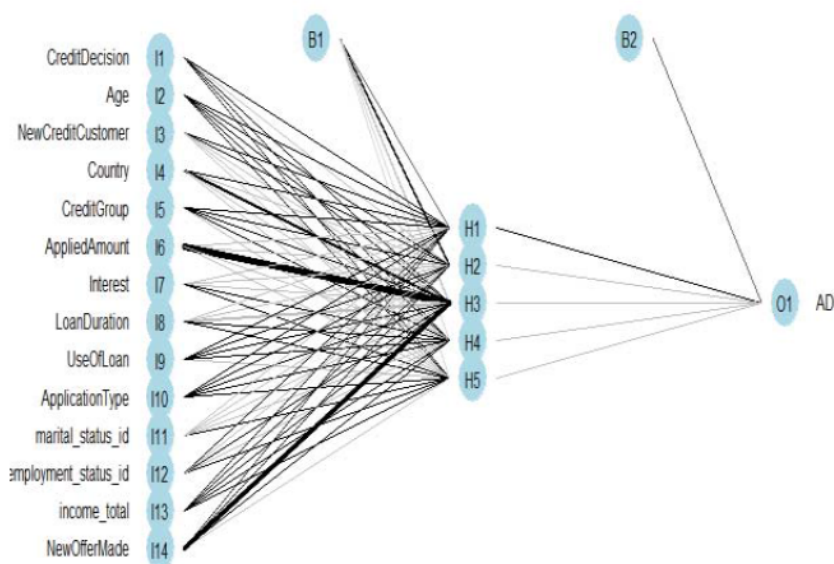


Figure.9.

of default that may occur in future.

As according to a discussion, a neural network of all these variables are required to be established and tested to ensure the degree by which each of these are affecting the credit risk both in the long and the short run (Byanjankar, Heikkila, Mezei, 2015).

In addition to this careful analysis of the types of loans and the purpose of the loan was also done to understand that if there was a particular type of loan that was being most defaulted on. However the loans mostly were listed for personal reasons including home loans and education, there was no set pattern discovered for such default on loans. Which means that purpose of the loan doesn't much affect the credit risk. For a wider view on the risk and returns associated with this form of lending, it was also compared with the asset and mortgage backed securities in the market. The idea behind this comparison was to understand the difference brought in by the intermediaries in the intermediation of the finances between the investors and the lenders. In Lending Club data from first quarter 2013 loan issuances, 4.44% of loans see a default risk, either they are late (2.16 percent) or in absolute default (2.28 percent) after a year. On an average the annual default rates for these P2P

platforms are approximately 5%. Using the equal-weighted mean interest rate from the first quarter 2013 (14.4 percent), a 5 percentage point default rate, and the fee structure implies a back-of-the-envelope IRR to investors of 8 percent. More formal performance statistics come from websites that track Prosper and Lending Club loans.

LendingRobot.com calculates the IRR of 277,814 Lending Club loans as of January 2015 to be 6.93%. LendStats.com puts the return on investment as 5.4 percent (Prosper) and 5.1 percent (Lending Club) over the period 2007-2014 and 8.7% (Prosper) and 7.0% (Lending Club). Lending Club and Prosper themselves posts return statistics.

Platform	Default risk (on an average, either late or complete default)	Return (on an average)
Lending Club	4.44%	7.2%
Prosper	5%	8%
Lending Stats	5%	8%
Lending Robot	5%	6.93%

Table.3.

The default rates on these platforms are a constituent based on the loans that are posted by borrowers on their websites. In addition to this though the asset backed and the mortgage backed securities are less risky as they have a fixed rate of return, the loans on P2P websites, also have very less risk involved while we can see that the interest rates are quite high and these keep on increasing keeping in mind the variables discussed above.

6. CONCLUSION AND DISCUSSION

Online financial platforms and P2P lending sites constitute an appropriate alternative to more traditional banking systems, as both a relatively solid investment channel and a channel for obtaining loans on convenient terms. At the same time, companies in the industry must act to increase legitimacy and reduce feelings of risk associated with using the platform. It is apparent that the P2P loan industry suffers from a lack of awareness about its existence, as well as a lack of knowledge about activity and the level of risk in providing social loans. Companies must raise awareness of

their existence as an alternative to the institutionalised banking system among the general public who is interested in convenient loans and attractive investments.

After interpreting the results we get that the dependent variable i.e. interest rates depends upon the various independent variables including monthly income and loan amount and it also has a positive correlation with the two which means as the monthly income and loan amount demanded by an individual borrower increases, the interest rate also increases. However, there exists no relationship as such between credit bureau score and tenure for which the amount is borrowed.

1. **The significance of positive correlation between monthly income and interest rates** suggest that borrowers with higher monthly income are being charged a higher interest rate than the borrowers with lower monthly income. This is in stark contrast with the fact that in the mainstream finance industry people with higher income are charged lower as compared to the one who have lower monthly incomes to balance out the effect of risk and return but P2P lending forms a part of the alternate finance industry which doesn't conform to the established standards of conventional finance and banking sector and therefore, the loan amount is readily available and the interest amount is being charged according to the ability of the borrower to repay the amount. Since the borrower is getting collateral free and easy loan for short term, hence the interest is charged according to the monthly income being earned by them, so that they can meet their debt obligation on time. In addition to this the regressor model applied also shows that monthly income is a statistically important variable in determining the interest rates here.
2. On similar lines as seen in the results, there exists a **positive correlation between the loan amount and the interest rate** charged for the loan, we can say this is in tandem with the traditional finance theory which argues that as the size of the loan expands, the interest charged on that loan amount rises to accommodate the increased risk associated with the loan (Moore, W. & Craigwell, R., 2010). Again in P2P lending, investors demand a higher rate if they are investing more and at the same time, borrowers are obligated to pay a higher interest for a greater amount taken as loan. Moreover we can see through the data that more personal loans are being demanded by the borrowers than

that for education or working capital or other purposes and hence it has a higher interest rate as compared to the others. If we look at the regressor results again we can say that purpose of the loan is one of the most important statistically significant variable in determining the interest rates.

3. A credit bureau score (CBS) is a statistical indicator of the likelihood that a customer will default on a payment over the next year, given that customer's historical behaviour as evidenced by credit bureau data. In traditional finance industry CBS is one of the key determining factor whether an individual will be entitled to get the loan or not but in P2P lending there is no relationship between **the interest rate and the CBS**. Which means that a borrower's credit standing doesn't have any effect on the amount invested by the investor as they are in contract with the platform and will be getting their interest on time. This might be problematic as it may create a bubble in the economy in long run because without estimating the credit standing of the borrowers before investing can lead to higher default on interests and since there is no collateral involved and all the procedures are taking place virtually, tracking these borrowers would be a task.
4. The **tenure of the loan** and the interest amount doesn't have any relationship between them and according to the regressor also it is not of much statistical significance to our data set. As according to the RBI guidelines the maximum tenure for loan in P2P lending can be not more than 36 months (RBI, 2017).
5. After applying the **regression model** on our dataset, we infer from the first and last regression that only Purpose, Monthly Income and Employment Type are the most statistically significant variables for determining the interest rate in the respective order. Lastly the predictions of Interest Rate from the test set were coherent with the actual dataset and varied in decimal points only.
6. Assessing the **credit risk** on these platforms we can effectively say from the results that there is not very high risk involved from the side of investors, a careful screening of each of the loan posting by the borrower needs to be done before taking the investment decisions. On comparison with asset backed and mortgage backed securities we also see that there is some risk involved but the return on investment in P2P

lending is higher as compared to any of these investment strategies. Hence it also helps in diversifying the portfolio and ensure regular returns for the investors.

We also conclude that P2P Lending has a bright future in the Indian markets, though it still lacks awareness amongst the investors and masses and need a set of proper set of guidelines for its regulation. Crowdfunding definitely has the potential to disrupt the traditional consumer finance industry, the technology driver disintermediated finance will continue to capture larger audiences and markets as the awareness and knowledge of the risks associated and the return attached reach the masses. A second qualifier is in assigning what the face of crowdfunding will be in the future (Morse, 2015). The CEO of AMEX recently said that the future of plastic cards is irrelevant to American Express's prospects. Will payment systems, credit and consumption all morph into a single rendition of Big Data? A crystal ball would be useful here, but my point is that my statement about disruption need not involve new players. Technology is disrupting consumer finance. Technology will continue to involve more and more information, which leads to my third qualifier. Big Data will surely matter in the future for credit scoring, which brings forth all sorts of uncertainties – privacy, monopoly power, discrimination, etc. It seems inevitable that the role of data is exponentially increasing, and thus we should get busy answering these questions. If proximity via Big Data unearths soft information not accessed or used by intermediated finance, then P2P should be able to offer pricing and/or access benefits to potential borrowers. The incidence of the capture of rents is not obvious. On the investor side, certainly these innovations will allow some investors to benefit from this asset class, which they already seem to be doing.

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8. APPENDIX

1. Table for Reference, Source – i2i funding

Loan ID	Purpose	Credit Bureau Score	i2i risk category	Interest Rate	Tenure	Employment Type	Monthly Income	Loan Amount	Product type
1	Working Capital Loan	616	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
2	Working Capital Loan	300	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
3	Working Capital Loan	725	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
6	Working Capital Loan	300	A	12	45	Self Employed Professional	20000	10000	Employer Partnership

7	Working Capital Loan	300	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
8	Working Capital Loan	777	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
9	Working Capital Loan	654	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
11	Working Capital Loan	782	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
12	Working Capital Loan	574	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
13	Working Capital Loan	633	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
14	Working Capital Loan	535	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
15	Working Capital Loan	300	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
16	Working Capital Loan	511	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
17	Working Capital Loan	758	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
18	Working Capital Loan	635	A	12	45	Self Employed Professional	20000	10000	Employer Partnership

19	Working Capital Loan	522	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
20	Working Capital Loan	300	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
22	Working Capital Loan	747	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
23	Working Capital Loan	637	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
24	Working Capital Loan	723	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
25	Working Capital Loan	699	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
26	Working Capital Loan	300	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
27	Working Capital Loan	783	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
28	Working Capital Loan	591	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
29	Working Capital Loan	657	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
30	Working Capital Loan	300	A	12	45	Self Employed Professional	20000	10000	Employer Partnership

32	Working Capital Loan	300	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
33	Working Capital Loan	670	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
34	Working Capital Loan	739	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
35	Working Capital Loan	611	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
39	Working Capital Loan	765	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
40	Working Capital Loan	641	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
41	Working Capital Loan	300	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
42	Working Capital Loan	300	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
43	Working Capital Loan	730	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
44	Working Capital Loan	626	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
46	Working Capital Loan	684	A	12	45	Self Employed Professional	20000	10000	Employer Partnership

47	Working Capital Loan	300	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
48	Working Capital Loan	778	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
49	Working Capital Loan	749	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
50	Working Capital Loan	586	A	12	45	Self Employed Professional	20000	10000	Employer Partnership
1	Education	777	B	15	365	Self Employed Professional	20000	49390	Course Subscription Fee
2	Education	785	B	15	365	Self Employed Professional	60000	16463	Course Subscription Fee
3	Education	819	B	15	365	Salaried Employee	60000	17286	Course Subscription Fee
4	Education	759	B	15	90	Salaried Employee	35000	8269	Course Subscription Fee
5	Education	564	B	15	365	Salaried Employee	60000	83964	Course Subscription Fee
7	Education	792	B	15	365	Salaried Employee	120000	14817	Course Subscription Fee
8	Education	469	B	15	365	Salaried Employee	50000	16463	Course Subscription Fee
9	Education	638	B	15	365	Salaried Employee	80000	16463	Course Subscription Fee
10	Education	571	B	15	365	Salaried Employee	125000	144056	Course Subscription Fee

11	Education	884	B	15	180	Self Employed Professional	25000	8574	Course Subscription Fee
12	Education	668	B	15	365	Salaried Employee	70000	29634	Course Subscription Fee
13	Education	674	B	15	365	Self Employed Professional	40000	14817	Course Subscription Fee
14	Education	737	B	15	365	Self Employed Professional	40000	40248	Course Subscription Fee
15	Education	532	B	15	365	Business	170000	73263	Course Subscription Fee
16	Education	785	B	15	365	Salaried Employee	90000	26341	Course Subscription Fee
17	Education	795	B	15	365	Salaried Employee	50000	16463	Course Subscription Fee
18	Education	520	B	15	365	Salaried Employee	250000	69970	Course Subscription Fee
19	Education	300	B	15	365	Salaried Employee	50000	14641	Course Subscription Fee
20	Education	762	B	15	90	Salaried Employee	150000	8753	Course Subscription Fee
21	Education	608	B	15	365	Salaried Employee	200000	32927	Course Subscription Fee
22	Education	726	B	15	395	Salaried Employee	18000	14817	Course Subscription Fee
23	Education	766	B	15	420	Self Employed Professional	290000	27582	Course Subscription Fee
24	Education	779	B	15	450	Salaried Employee	55000	78992	Course Subscription Fee

25	Education	687	B	15	270	Self Employed Professional	55000	30243	Course Subscription Fee
27	Education	792	B	15	365	Self Employed Professional	20000	16463	Course Subscription Fee
30	Education	680	B	15	365	Salaried Employee	55000	73263	Course Subscription Fee
31	Education	806	B	15	365	Salaried Employee	50000	22412	Course Subscription Fee
32	Education	577	B	15	365	Salaried Employee	95000	18713	Course Subscription Fee
33	Education	818	B	15	365	Salaried Employee	18000	26199	Course Subscription Fee
36	Education	701	B	15	365	Salaried Employee	70000	82318	Course Subscription Fee
38	Education	799	B	15	365	Salaried Employee	100000	49390	Course Subscription Fee
39	Education	634	B	15	365	Salaried Employee	120000	41159	Course Subscription Fee
40	Education	842	B	15	365	Salaried Employee	53000	24695	Course Subscription Fee
41	Education	676	B	15	365	Salaried Employee	180000	82318	Course Subscription Fee
42	Education	555	B	15	365	Business	42000	28811	Course Subscription Fee
43	Education	819	B	15	365	Salaried Employee	60000	49390	Course Subscription Fee
44	Education	802	B	16	365	Salaried Employee	35000	14550	Course Subscription Fee

46	Education	804	B	16	365	Salaried Employee	35000	32722	Course Subscription Fee
48	Education	742	B	15	365	Salaried Employee	90000	54878	Course Subscription Fee
49	Education	300	B	15	365	Business	45000	29272	Course Subscription Fee
50	Education	760	B	16	365	Salaried Employee	35000	13634	Course Subscription Fee
1	Personal Loan	300	C	18	90	Salaried Employee	92500	10000	Backed by Partner Company
2	Personal Loan	622	C	18	90	Salaried Employee	20823	5000	Backed by Partner Company
3	Personal Loan	300	C	18	90	Salaried Employee	35000	7000	Backed by Partner Company
4	Personal Loan	637	C	18	90	Salaried Employee	26009	8000	Backed by Partner Company
5	Personal Loan	300	C	18	90	Salaried Employee	65111	30000	Backed by Partner Company
6	Personal Loan	637	C	18	90	Salaried Employee	31305	10000	Backed by Partner Company
7	Personal Loan	630	C	18	90	Salaried Employee	36320	7000	Backed by Partner Company
8	Personal Loan	617	C	18	90	Salaried Employee	30000	11992	Backed by Partner Company
9	Personal Loan	574	C	18	90	Salaried Employee	33566	18000	Backed by Partner Company
10	Personal Loan	300	C	18	90	Salaried Employee	53762	14000	Backed by Partner Company
11	Personal Loan	300	C	18	90	Salaried Employee	92500	6000	Backed by Partner Company

12	Personal Loan	300	C	18	90	Salaried Employee	46685	20000	Backed by Partner Company
13	Personal Loan	754	C	18	90	Salaried Employee	22009	10000	Backed by Partner Company
14	Personal Loan	641	C	18	90	Salaried Employee	37947	15000	Backed by Partner Company
15	Personal Loan	621	C	18	90	Salaried Employee	39443	16000	Backed by Partner Company
16	Personal Loan	598	C	18	90	Salaried Employee	20354	10000	Backed by Partner Company
17	Personal Loan	300	C	18	90	Salaried Employee	48785	33000	Backed by Partner Company
18	Personal Loan	300	C	18	90	Salaried Employee	89811	25000	Backed by Partner Company
19	Personal Loan	300	C	18	90	Salaried Employee	70214	26000	Backed by Partner Company
20	Personal Loan	609	C	18	90	Salaried Employee	30995	10000	Backed by Partner Company
21	Personal Loan	598	C	18	90	Salaried Employee	27221	8000	Backed by Partner Company
22	Personal Loan	633	C	18	90	Salaried Employee	11000	9000	Backed by Partner Company
23	Personal Loan	602	C	18	90	Salaried Employee	33132	10000	Backed by Partner Company
24	Personal Loan	585	C	18	90	Salaried Employee	20464	8000	Backed by Partner Company
25	Personal Loan	300	C	18	90	Salaried Employee	112190	35000	Backed by Partner Company
26	Personal Loan	645	C	18	90	Salaried Employee	37754	20000	Backed by Partner Company

27	Personal Loan	300	C	18	90	Salaried Employee	71110	26000	Backed by Partner Company
28	Personal Loan	600	C	18	90	Salaried Employee	21013	283026	Backed by Partner Company
29	Personal Loan	748	C	18	90	Salaried Employee	66423	212287	Backed by Partner Company
30	Personal Loan	424	C	18	90	Salaried Employee	52222	200199	Backed by Partner Company
31	Personal Loan	451	C	18	90	Salaried Employee	40971	68644	Backed by Partner Company
32	Personal Loan	737	C	18	90	Salaried Employee	84365	265075	Backed by Partner Company
33	Personal Loan	558	C	18	90	Salaried Employee	74182	162070	Backed by Partner Company
34	Personal Loan	537	C	18	90	Salaried Employee	27130	228408	Backed by Partner Company
35	Personal Loan	688	C	18	90	Salaried Employee	84500	24240	Backed by Partner Company
36	Personal Loan	593	C	18	90	Salaried Employee	97243	303430	Backed by Partner Company
37	Personal Loan	590	C	18	90	Salaried Employee	81415	158784	Backed by Partner Company
38	Personal Loan	503	C	18	90	Salaried Employee	22615	380872	Backed by Partner Company
39	Personal Loan	517	C	18	90	Salaried Employee	60443	306686	Backed by Partner Company
40	Personal Loan	703	C	18	90	Salaried Employee	36308	175410	Backed by Partner Company
41	Personal Loan	674	C	18	90	Salaried Employee	29174	160551	Backed by Partner Company

42	Personal Loan	501	C	18	90	Salaried Employee	96162	117984	Backed by Partner Company
43	Personal Loan	717	C	18	90	Salaried Employee	51811	373399	Backed by Partner Company
44	Personal Loan	434	C	18	90	Salaried Employee	68784	312922	Backed by Partner Company
45	Personal Loan	722	C	18	90	Salaried Employee	22094	78302	Backed by Partner Company
46	Personal Loan	480	C	18	90	Salaried Employee	58833	219765	Backed by Partner Company
47	Personal Loan	731	C	18	90	Salaried Employee	39903	62859	Backed by Partner Company
48	Personal Loan	713	C	18	90	Salaried Employee	30104	239940	Backed by Partner Company
49	Personal Loan	480	C	18	90	Salaried Employee	94175	368176	Backed by Partner Company
50	Personal Loan	723	C	18	90	Salaried Employee	61474	177614	Backed by Partner Company
2	Loan against invoice	621	D	20	30	Self Employed Professional	25000	150000	Loan Against Invoice
3	House Renovation	704	D	22	108	Salaried Employee	38890	150000	Regular Loans
4	Loan against invoice	615	D	20	30	Self Employed Professional	25000	250000	Loan Against Invoice
5	Relative's Marriage	752	D	22	108	Salaried Employee	48282	300000	Regular Loans
6	Loan against invoice	679	D	20	30	Self Employed Professional	25000	520000	Loan Against Invoice

2. Figure 1. – Adroit Market Research 2019

3. Figure 2. - <https://www.sepaforcorporates.com/thoughts/disruptive-innovation-explained-10-crazy-infographics/>
4. Figure 3. - Working of P2P Lending
5. Figure 4 - <https://link.springer.com/article/10.1007/s10660-018-9291-1>
6. Figure 5 – Snapshot from regression result - SPSS
7. Figure 6 – Snapshot from regression result - SPSS
8. Figure 7 – Snapshot from regression result - SPSS
9. Figure 8 – Snapshot from regression result - SPSS
10. Table 1 – Platform Analysis
11. Table 2 – Observations and results - SPSS
12. Table 3 – Platform Analysis
13. R script –

```
#Data preprocessing
```

```
#Importing the Database
```

```
database = readxl::read_xlsx('Data2.xlsx')
```

```
# Encoding the categorical data
```

```
database$Purpose = factor(database$Purpose,  
                           levels = c('Working Capital Loan', 'Education', 'Personal Loan'),  
                           labels = c(1,2,3))
```

```
database$i2i_risk_category = factor(database$i2i_risk_category`,  
                                    levels = c('A', 'B', 'C'),  
                                    labels = c(4,5,6))
```

```
database$Employment_Type = factor(database$Employment_Type`,  
                                   levels = c('Self Employed Professional', 'Salaried Employee',  
                                   'Business'),  
                                   labels = c(7,8,9))
```

```
database$Product_type = factor(database$Product_type`,  
                                levels = c('Employer Partnership', 'Course Subscription Fee',  
                                'Backed by Partner Company'),  
                                labels = c(10,11,12))
```

```
#Splitting the Dataset into training set and Test set.
```

```
#install.packages("caTools")
```

```
library(caTools)
```

```
set.seed(12345)
```

```
split = sample.split(database$Purpose, SplitRatio = 0.8)
```

```
training_set = subset(database, split == TRUE)
```

```
test_set = subset(database, split == FALSE)
```

```
# Feature Scaling
```

```
# Training Set
```

```
training_set[, 6:7] = scale(training_set[, 6:7])
```

```
training_set[, 2] = scale(training_set[, 2])
```

```
training_set[, 4] = scale(training_set[, 4])
```

```
training_set[, 9] = scale(training_set[, 9])
```

```
# Test Set
```

```
test_set[, 6:7] = scale(test_set[, 6:7])
```

```
test_set[, 2] = scale(test_set[, 2])
```

```
test_set[, 4] = scale(test_set[, 4])
```

```
test_set[, 9] = scale(test_set[, 9])
```

```
# Fitting Multiple Linear Regression Model to the Training Set.
```

```
regressor = lm(formula = Interest_Rate ~ Purpose + Employment_Type +  
Monthly_Income,  
data = training_set)
```

9. Plagiarism Report

P2P Lending 'Priyanka Gupta'70 (1).docx

Sources Overview

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