Subject: Economics

Paper component: Extended Essay

Language: English

Exam session: May 2018

Essay: 28 (Price discrimination in Hyderabad)

Criterion	Mark	Out of	Justification
A	5	6	The topic is clearly presented and appropriate for an investigation. It was pleasing to read a price discrimination research question with a purpose for an investigation (rather than the basic “To what extent does Firm X practice PD?). The methodology uses a variety of sources related to the topic, including a survey where the student even took into account the best sample size for valid results.
B	5	6	Considerable knowledge and understanding are demonstrated, with effective application of economic theory. The use of economics terminology is accurate and well-embedded into the discussion. There are some steps missing the explanations of the different types of PD.
C	10	12	There is very good research to support the analysis. The analysis is very good – logical and focussed. An effective argument is developed with evidence of some appropriate critical evaluation.
D	4	4	Presentation is very good.
E	4	6	There is decent reflection on problems solving and personal development. However, this could have been more effective had the student included somewhat less description of the process.
Total:	28	34	

Candidate Marks Report

Series : M18 2018

This candidate's script has been assessed using On-Screen Marking. The marks are therefore not shown on the script itself, but are summarised in the table below.

Centre No :		Assessment Code :	ECONOMICS EE EXTENDED ESSAY in ENGLISH
Candidate No :		Component Code :	EE(ENG)TZ0
Candidate Name :			

In the table below 'Total Mark' records the mark scored by this candidate.
'Max Mark' records the Maximum Mark available for the question.

Examiner:	
Paper:	**M18econoEEEE0XXXX**
Paper Total:	**28 / 34**
Question	Total Mark / Max Mark
Criterion A	5 / 6
Criterion B	5 / 6
Criterion C	10 / 12
Criterion D	4 / 4
Criterion E	4 / 6

Coursework confirmation
Yes

Hours supervisor spent with candidate
4

EXTENDED ESSAY IN ECONOMICS

Topic – Price discrimination in peer-to-peer lending markets

"To what extent does price discrimination affect the cost of borrowing in the online peer-to-peer (P2P) lending market in Hyderabad?"

Word Count: 3932

A
Purpose and focus is clear. RQ is interesting. The context could have been better clarified. Good research carried out.
B
Very good use of economic theory and terminology. Missing some steps in the explanations of the different types of PD
C
Very good research to support the analysis. Analysis is very good - logical and focused. An effective argument is developed, with some evidence of critical analysis.
D
Presentation is very good.
E.
Personal engagement is demonstrated - though could have been more had the student included less description.

Table of Contents

1. Introduction

The emergence of the concept of shared economy and FinTech has opened new avenues of economic activity for the internet users of the 21st century. The desire to share rather than own led to the growth of ride-sharing companies such as Uber and Ola; similarly, people are opting to borrow from people rather than from a financial institution. This has been enabled by technology driving greater smartphone and internet penetration. As a result, online peer-to-peer (P2P) lending platforms emerged under the Fintech industry which have disrupted the traditional lending markets.

In 2014, only 6.4% of the Indian population borrowed from a financial institution whereas 12.6% of the population borrowed from a private moneylender and an additional 32.3% borrowed from their family or friends[1]. Banks deny loans due to poor-credit scores or lack of collateral and the hassle-filled processes needed to obtain a loan make it more difficult [2]. P2P platforms remove intermediaries from the process of lending and connects those willing to lend with those looking to borrow[3]. In this system, interest rates are flexible and borrowers and lenders negotiate their own terms. The global market for P2P lending is expected to grow at a compound annual growth rate of 60%, dominating the alternative lending market[4].

Currently this market is unregulated in India, which has led to the high expansion of such platforms in the nation. However, the Reserve bank of India has proposed certain regulation by classifying online P2P lending firms as Non-Banking Financial Corporations (NBFC)[5].

---

[1] "Financial Inclusion Data / Global Findex." Financial Inclusion Data. Accessed July 02, 2017, http://datatopics.worldbank.org/financialinclusion/country/india
[2] Alistair Milne and Paul Parboteeah, "The Business Models and Economics of Peer-to-Peer Lending," SSRN Electronic Journal (2016): P.4, doi:10.2139/ssrn.2763682.
[3] Ibid., P. 2-3.
[4] Fintech in India- A global growth story. Report. KPMG in India and NASSCOM 10,000 Start-ups, date published June, 2016, accessed June 24, 2017, https://assets.kpmg.com/content/dam/kpmg/pdf/2016/06/FinTech-new.pdf
[5] "Consultation Paper on Peer to Peer Lending." Reserve Bank of India – Database, last modified April 28, 2016, accessed August 03, 2017, https://rbi.org.in/scripts/Bs_viewcontent.aspx?Id=3164

The lack of regulation surrounding recovery practices has led to high default rates in this sector of about 1%-3%[6].

The purpose of this paper is to explore the borrower and lender behaviour in the shared economy of loans. This will give greater insight into the factors that affect the cost of borrowing in online P2P markets. As this is an emerging sector, research will greatly help start-ups in this industry to form their business models and policies. Evidence of price-discrimination will enable borrowers to make more informed choices and can help lenders to set interest rates in such a way to maximize returns.

Hence, the research question- **"To what extent does price discrimination affect the cost of borrowing in the online peer-to-peer (P2P) lending market in Hyderabad?"**

could explain context more clearly

Who 'manages' the market? Context not clear.

1.1 Hypothesis

It has been hypothesized that first-degree price discrimination exists as lenders attempt to charge higher interest rates for borrowers with a higher ability and willingness to pay. In a study of the Swiss P2P market, it was found that interest rates are higher for loans of larger amounts and for loans of longer durations[7]. Hence, it has been hypothesized that for loans of larger amounts, the interest rates will be higher indicating that loan amount is directly proportional to the interest rate.

There exists asymmetrical information in the market as the lenders are less informed about the risk associated with a particular borrower[8]. Hence, the lending platform undertakes a screening process to evaluate a borrower's ability to repay and provide a credit rating. It has

[6] Khatri, Yogitha, "P2P lending: A new opportunity for investors eyeing regular income." Economic Times, last modified October 05, 2016, accessed August 3, 2017, http://economictimes.indiatimes.com/wealth/borrow/p2p-lending-a-new-opportunity-for-investors-eyeing-regular-income/articleshow/54691315.cms

[7] Andreas Dietrich and Reto Wernli, "What Drives the Interest Rates in the P2P Consumer Lending Market? Empirical Evidence from Switzerland," *SSRN Electronic Journal* (2016), http://www.efmaefm.org/0EFMAMEETINGS/EFMA%20ANNUAL%20MEETINGS/2016-Switzerland/papers/EFMA2016_0240_fullpaper.pdf .

[8] Dairo Estrada and Paula Zamora, "P2P Lending and Screening Incentives," *Journal of Economic Literature* (2016), https://www.p2pfisy.com/wp-content/uploads/2017/04/Paper_31-min.pdf.

been hypothesized that third-degree price discrimination exists with higher interest rates being charged for riskier borrowers and borrowers with a greater need for a loan in the Hyderabad market.

1.2 Methodology for Data Collection

To conduct an apt investigation to answer this question, both primary and secondary sources were used for data collection.

More needed about this company

Company records of 158 borrowers and their respective lenders were collected from i-lend, an online peer-to-peer lending start-up based in Hyderabad. This data includes borrower's details, income loan amount and duration, interest rate and credit-risk rating of borrower. It also includes lender information, number and value of loans sanctioned, and interest rate lent at. Moreover, it links each borrower to the lenders they borrowed from. The relationship between interest rates and loan volume was used to determine second-degree price discrimination. Finally, third-degree price discrimination was evaluated using credit score ratings to check whether interest rates are higher for riskier borrowers. Microsoft excel's analysis tools were used to perform bivariate regression to determine the relationship between the above-mentioned variables and to plot charts to reveal trends in borrowing patterns.

Secondary sources such as economic journals and world bank were used to understand the online P2P lending market, obtain statistics related to financial inclusion and review existing literature with regard to price discrimination, especially in the lending market.

To support the company records, primary sources were used in the form of telephonic interviews. An interview transcript for the borrowers[9] was created with which a total of 48 borrowers were interviewed. Of the population size of 158 borrowers, the sample size was determined using an equation[10]. With a margin of error of 10% at the 90% confidence level,

[9] Refer to Appendix 2
[10] Refer to Appendix 1

the sample size was calculated to be 48. These 48 borrowers were selected randomly with the help of a random number generator. A total of 50 borrowers were called as 2 borrowers refused to be part of the interview. These interviews were intended to understand the consumer behaviour of the borrowers. It was used to determine the demand elasticity for borrowers by inquiring about the willingness to pay higher interest rates for the same loans and the need for the loan at the time of borrowing.

2. Discussion

2.1 Loan Process

The rate of interest can be understood as the 'price' for money services. Demand for loans can be represented as a negative causal relationship between rate of interest and quantity demanded[11].

In the online P2P lending market, the reverse auction model is followed wherein lenders bid for a borrower's loan and the borrower can choose to either accept or reject it[12]. Borrowers can select multiple offers which are equal or less than the amount requested by the borrower. At i-lend and multiple such firms, each borrower receives the final loan amount from more than one lender. The lending platform encourages lenders to only provide 20% of the loan amount to each borrower[13]. This diversifies the risk asset of the lender in the instance of a default. However, the final interest rate of the borrower is determined by the weighted average of the loan offers accepted by the borrower[14].

Unlike traditional suppliers, the lenders do not have a fixed cost but rather have a risk arising due to default of repayment. The costs of price discrimination for lenders are lower as the online P2P lending platform provides a credit-score rating. The cost of market segmentation is not borne by the lenders and the resale of loans is prevented by the requirement for an individual to register only as either a borrower or lender[15].

This makes some sense, but assumes a leap of faith that the assertions are valid. More explanation would help. Are these descriptions valid for all P2P lending, or just within this market?

[11] Ellie Tragakes, Economics for the IB Diploma, Second ed., (Cambridge University Press, 2012), P. 331.
[12] Ning Chen, Arpita Ghosh, and Nicolas S. Lambert, "Auctions for social lending: A theoretical analysis," *Games and Economic Behavior 86* (2014): P. 367-391, https://web.stanford.edu/~nlambert/papers/Chen_Ghosh_Lambert_(GEB_2014).pdf
[13] Khatri, Yogitha, "P2P lending: A new opportunity for investors eyeing regular income." Economic Times, last modified October 05, 2016, accessed August 3, 2017, http://economictimes.indiatimes.com/wealth/borrow/p2p-lending-a-new-opportunity-for-investors-eyeing-regular-income/articleshow/54691315.cms
[14] "FAQ'S," FAQ |Personal Loans, Online Money, Money Lenders| i-Lend, last modified 2018, accessed February 02, 2018, https://www.i-lend.in/faqs.html.
[15] "Lending Policy," Peerlend.in, accessed February 02, 2018, https://www.peerlend.in/P2P/LendingPolicy

Interest on loans in the lending market operate on the concept of risk-premiums. Risk premium is the average return that investors require over the risk-free rate (on government securities) for accepting the higher variability in returns[16]. However, loans disbursed on the online P2P lending platforms are riskier due to higher chance of defaulting by the borrower. Borrowers will pay a higher premium to obtain the loans.

OK

It would be good to know more about the borrowers and lenders. Businesses? Households? Financial institutions?

2.2 Market Analysis

The online P2P lending market is in the alternative lending sector and experiences competition from traditional banks to a certain extent. Firms differentiate their prices on the basis of some characteristic such as quantity or elasticity of demand. Lenders, in this case, have the market power to charge different interest rates for borrowers of different characteristics and requirements.

After analysing the market, it was found that each borrower's loan had different characteristics in terms of interest rate, loan amount and tenure. The average interest rate was 21.49% per annum with a standard deviation of 2.98% which is evidence to the high variance in interest rates between individuals[17]. The interest rate is significantly higher than the rate at which banks in India offer loans. The borrowers were questioned about their reasons for choosing an online P2P lending platform over a traditional bank.

who are they?

Reason	Number	Percentage
Bank Denied a loan	14	23.73%
CIBIL issues	15	25.42%
Higher convenience than banks	15	25.42%
Lower interest rate than private lenders	2	3.39%
Try online P2P lending	6	10.17%
Others	7	11.86%

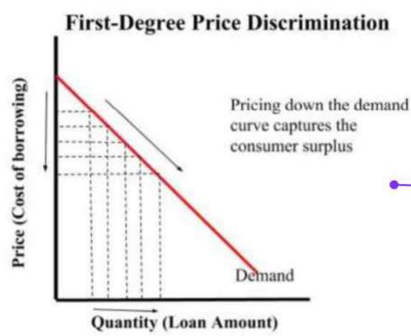
Table 1: Reasons for choosing an online P2P lending platform.

[16] Fernando Duarte and Carlo Rosa, "The Equity Risk Premium: A Review of Models," *SSRN Electronic Journal* (2015), https://www.newyorkfed.org/medialibrary/media/research/epr/2015/2015_epr_equity-risk-premium.pdf?la=en.
[17] Refer to Appendix 6

In the interview, 11 of the 48 borrowers selected more than one reason. The options 'Bank denied a loan' and 'CIBIL issues' were widely repeated. CIBIL is a credit information company in India which provides credit-score ratings to borrowers[18]. Hence, 'CIBIL' issues stand for poor credit-score ratings due to which loans are not sanctioned. Only half of the market couldn't use banks as an alternative while the others voluntarily chose to use the platform. The borrowers who were denied a loan from bank and had CIBIL issues had a greater need for a loan from this particular platform than others[19].

2.3 First-degree price discrimination

When a lender charges the maximum interest rate a borrower is willing and able to pay, first degree price discrimination occurs. If the borrower is unwilling to pay interest rate higher than the one already paid, then consumer surplus does not exist, resulting in complete first-degree price discrimination[20].



more explanation needed

Figure 1: Graph representing first-degree price discrimination.

[18] "Understanding CIBIL: Functions, Product and Service | CIBIL," TransUnion, accessed February 03, 2018, https://www.cibil.com/faq-brochure.
[19] See Appendix 3
[20] Hal R. Varian, "Chapter 10 Price discrimination," Handbook of Industrial Organization Handbook of Industrial Organization Volume 1 (1989), https://eclass.uoa.gr/modules/document/file.php/D404/Study%20Material/Varian_Price%20discrimination_IOHanbook_1989.pdf.

The drawback is that lenders do not have any explicit costs, but instead have opportunity cost for the money lent along with the risk of not getting returns. In this case, they capture all of the consumer surplus as the borrower is paying the maximum willingness. This form of price discrimination is usually difficult to implement as each borrower has a different purchasing power.

Willingness to pay was calculated using primary data from borrowers. In the interview with the borrowers, they were asked about the maximum interest they were willing to pay for the loans that they had already received. This information was validated using secondary sources to check the interest rate that the borrowers had received the loan at and the number of percentage points higher they were willing to pay to obtain the same loan.

Percentage points higher	Number	Percentage
0%	27	56.25 %
1%	7	14.58%
2%	4	8.33%
3%	5	10.42%
4%	4	8.33%
5%	1	2.08%
More than 5%	0	0.00%

Table 2: Maximum interest rate that borrowers were willing to pay.

The data shows that 27 of the 48 borrowers were unwilling to pay a higher interest rate for the loan they sought. The consumer surplus no longer exists for these borrowers as they are paying their interests at their maximum willingness. However, for the other 21 borrowers their respective lenders were unable to identify the borrower's maximum willingness to pay and failed to capture all of the consumer surplus. Among these borrowers, 11 were only willing to pay a maximum of 1%-2% additional interest rates on their loans which shows that although a high proportion of their consumer surplus was captured, the lenders failed to maximize their profits by lending the loans at the maximum interest rate at which these borrowers were willing to pay.

The borrowers were asked another question to determine whether they received the loan at the interest rate they sought it for or not[21].

Received at or below the interest rate expected?	Number	Percentage
Yes	20	41.67 %
No	28	58.33 %

Table 3: Was the loan received at or below the expected interest rate?

OK

The results show that 41.67% of the respondents received their loans at or below an interest rate that they sought it for. Interestingly, 43.75% of the respondents did not pay the maximum willingness for their respective interest rates. It can be inferred that those borrowers who paid their maximum willingness for the interest rates on their loans received the loan at a higher interest rate than expected by them.

The borrowers who received the loan at a higher interest rate than expected and were unwilling to pay a higher interest rate than the rate at which they obtained the loan had their entire consumer surplus captured by their respective lenders. However, 43.75% of the borrowers from the sample pool were subject to first-degree price discrimination. Hence, this provides insufficient evidence to prove the existence of complete first-degree price discrimination due to the inability of lenders to capture the consumer surplus of all its borrowers and hence, first degree price discrimination only partially exists.

2.4 Second Degree Price discrimination

The second-degree price discrimination model is based on the quantity purchased (loan amount), as the lender attempts to gain a part of the consumer surplus as profits. The borrowers that borrow larger amounts have a bit of consumer surplus left with them, as they receive a lower interest rate in the form of a quantity discount[22]. However, when the risk-

theory not quite so clear here

[21] See Appendix 4

[22] "Economic principles and problems-Micro Section 1: Monopolies," ECON 150: Microeconomics, accessed July 27, 2017, https://courses.byui.edu/econ_150/econ_150_old_site/lesson_08.htm.

factor is taken into account, loans of larger amounts have a higher risk associated with it. To compensate for the higher risk, the lender may charge higher interest rates.

Borrowers were asked whether they believe that interest rate should decrease, increase or stay the same if loan amount rises.

If loan amount increases, interest rate should?	**Number**	**Percentage**
Increase	10	20.83%
Decrease	36	72.92%
Stay the same	3	6.25%

Table 4: Borrowers opinion of variation of interest rate with loan amount

72.92% borrowers believe that interest rate should be lower as loan amount increases ceteris paribus [23]. Lenders will gain higher returns as loan amount is higher, so the lower interest is a form of quantity discount to incentivize the borrowers to take loans of higher amounts.

Secondary data was analysed to determine the relationship between loan amount and interest rates. The loan tenure was kept constant at 12 months. There were three relationships between loan amount and interest rate, one at each risk rating. This was done to overcome the effect of credit-risk rating of a borrower on the interest rate as it is a confounding variable. Interest rates were taken on the x-axis to ensure that the gradient represents the change in loan amount for an increase in one percentage point in interest rate.

[23] See Appendix 5

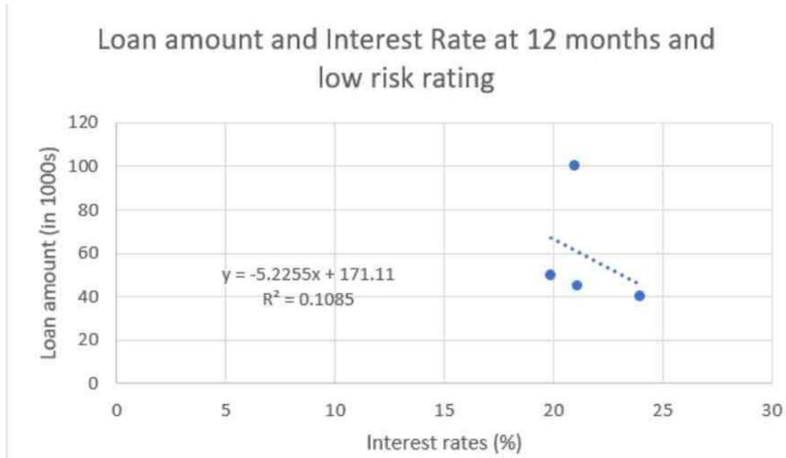


Figure 2: Relationship between loan amount and interest rate for low-risk borrowers

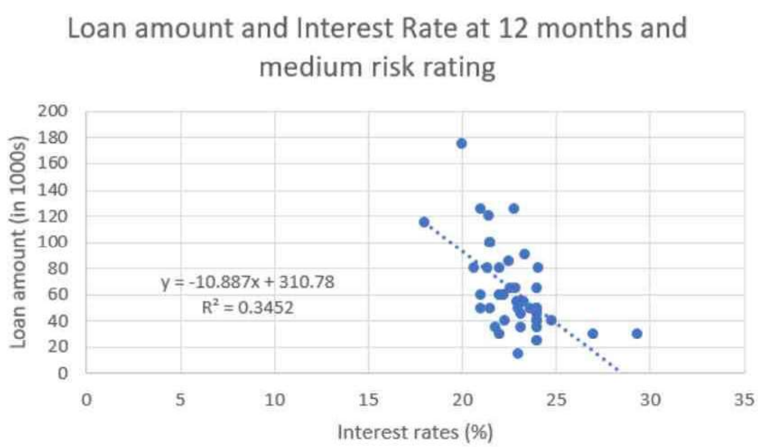


Figure 3: Relationship between loan amount and interest rate for medium-risk borrowers

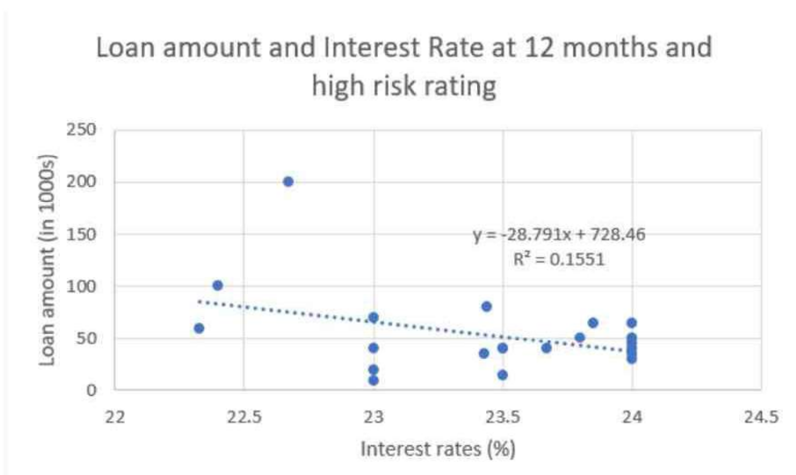


Figure 4: Relationship between loan amount and interest rate for high-risk borrowers

In all the three graphs, the interest rate decreases for higher loan amounts. For loans of a tenure of 12 months with a low borrower risk rating, the interest rate decreases by 1% for an increase of Rs. 5,225 in the loan amount. As there are only 4 data points, the error for this relationship will be higher. Similarly, for loans of similar tenure but with a medium borrower risk rating, the interest rate decreases by 1% for an increase in Rs. 10,887 in loan amount and with a high borrower risk rating, the interest rate decreases by 1% for an increase in Rs. 28,791 in loan amount. This shows a negative relationship between interest rate and loan amount which provides evidence for second degree price discrimination. As the riskiness of a borrower increases, the increase in loan amount for a decrease in interest rate of 1% rises. This signifies that for riskier borrowers, second-degree price discrimination is more prevalent and the quantity discounts are greater.

The coefficient of determination for the trendlines in all the three relationships is low due to high variance of loan amount for a single interest rate. This decreases the strength of correlation between the two variables. As the coefficient of determination is low, the reliability of results will be lower due to confounding variables. Although, the factors of monthly income and need of loan have not been accounted for, there is a general trend for interest rate to decrease with increasing loan amounts in the online peer-to-peer lending market.

good analysis and evaluation

2.5 Third-degree price discrimination

Third-degree price discrimination is the most common form of price-discrimination, occurring when lenders cannot identify individual demands, but can segregate borrowers into distinct groups with different elasticities of demand[24]. Primary data from borrowers and

[24] Hal R. Varian, "Chapter 10 Price discrimination," Handbook of Industrial Organization Handbook of Industrial Organization Volume 1 (1989), https://eclass.uoa.gr/modules/document/file.php/D404/Study%20Material/Varian_Price%20discrimination_IOHanbook_1989.pdf.

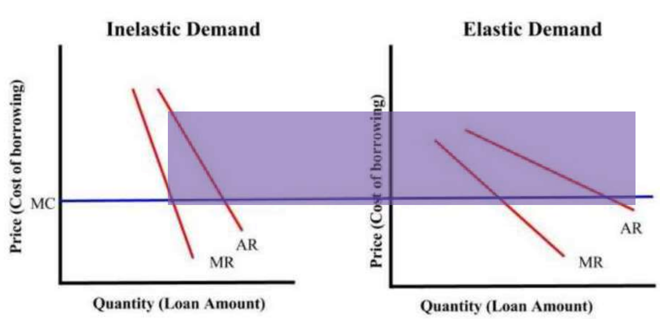
lenders were used to qualify whereas secondary data was used to quantify third-degree price discrimination. Lenders segment borrowers based on their respective elasticities of demand for a loan. A low credit score, denial of loan from a bank and the need for the loan at the time of borrowing determine the elasticity of demand for a borrower.

Borrowers were asked to rate their need for a loan at the time of applying for it on a scale of 1 to 5, with 1 being very low need and 5 being very high need. The need ratings were tallied with whether they received the loan at the interest rate they sought it for or not.

Need Rating	**Count**	**Received loan at higher interest than expected?**	**Proportion**	**Received loan at or below expected interest rate?**	**Proportion**
5 – Very High	12	9	75%	3	25%
4 – High	24	16	66.7%	8	33.3%
3 – Medium	7	2	28.6%	5	71.4%
2 – Low	4	1	25%	3	75%
1 – Very Low	0	-	-	-	-

Table 5: Need for loan and expected interest rate

For borrowers with a low or medium need, the borrowers that received their loans at or below the expected interest rate forms a higher proportion. In contrast, borrowers with a high or very high need, the borrowers that received their loan at an interest rate higher than expected forms a higher proportion. There is a linear trend between need rating and proportion of borrowers receiving their loans at a higher interest rate than expected.



How could this type of PD be differentiated from the other types?
e.g. High need for a large amount would put a borrower into two groups

show higher rate

Figure 5: Graph representing third-degree price discrimination.

As the need rating increases, the proportion of borrowers receiving the loan at a higher interest rate than expected increases. The borrowers with a low or medium need rating have a more elastic demand than borrowers with very high or high rating, as represented by figure 5. These segregate the borrowers based on the elasticity of demand with the more inelastic borrowers, who have a steeper demand curve, incurring a higher cost of borrowing than expected by them. As the value of the interest rate, in this case, is not mentioned, it is not possible to quantify the difference in the cost of borrowing of different groups

Each borrower is given a risk-rating by the online P2P lending platform after taking into account loan history, CIBIL rating, financial status, social profile, and other quantitative rating[25]. The borrowers were grouped on their risk rating into three categories- high-risk, medium-risk and low-risk. For each category, the average interest rate of the loans disbursed to the borrowers were calculated.

ok - this answers previous question

Risk-Rating	Proportion	Interest Rate
Low-risk	10.5%	22.24%
Medium-risk	65.1%	22.78%
High-risk	24.4%	23.43%

Table 6: Borrower risk rating and average interest rate

Higher interest rates are charged for riskier borrowers. The increase in interest rate from medium-risk to high-risk is slightly higher than the increase from low-risk to medium-risk as there is a larger uncertainty surrounding repayment with high-risk borrowers. 65% of the borrowers belonged to the medium-risk category indicating that low-risk borrowers do not prefer to borrow from online P2P lending platforms as they have cheaper alternatives available while high-risk borrowers do not get their loans approved and lenders are not willing to lend to them. This can be attributed to two reasons. Firstly, the borrowers with a

[25] "FAQ'S," FAQ |Personal Loans, Online Money, Money Lenders| i-Lend, last modified 2018, accessed February 02, 2018, https://www.i-lend.in/faqs.html.

higher-risk rating are not eligible for loans from banks, and have few alternatives, hence their demand is more inelastic. This enables the lenders to charge higher-interest rates. Secondly, high-risk borrowers have a greater chance of defaulting by not repaying the full amount. The risk-premium for such borrowers would be higher and they would be forced to incur a higher cost of borrowing.

2.6 Evaluation of the peer-to-peer lending market

As borrowers become more aware of the practices of price discrimination in online P2P lending platforms, they can make more informed choices with regard to amount to be borrowed and the respective cost of borrowing. As more start-ups in this industry begin to capture significant market share, the competition Unsp. increases. These factors help decrease the degree of asymmetric information.

Online P2P lending platforms are being preferred over traditional banks despite the relatively higher interest rates for borrowers in Hyderabad. The large sector of the population which is denied access to credit coupled with the high convenience offered by these platforms make it an attractive option. Compared to banks, online P2P platforms have lower fixed costs as they require lesser office space. They require lesser staff, as most of the transaction happens on the internet which gives them a competitive advantage over the banks. Even lenders benefit from higher returns and periodic payments which makes this platform a reliable investment option.

more evidence would help here.

The volume of loans disbursed by online P2P lending platforms is relatively small when compared to the volume disbursed by traditional banks, so its impact currently on the banking sector is small[26]. However, it has been observed that traditional banks worldwide have

evidence?

This may all be valid - but more evidence would help support claims

[26] Calebe De Roure, Loriana Pelizzon, and Paolo Tasca, "How Does P2P Lending Fit into the Consumer Credit Market?" *SSRN Electronic Journal*, December 12, 2016, https://www.bundesbank.de/Redaktion/EN/Downloads/Publications/Discussion_Paper_1/2016/2016_08_12_dkp_30.pdf?__blob=publicationFile.

partnered with online P2P lending platforms such as JP Morgan partnering with OnDeck capital to outsource business loans below US $250,000 [27] and Santander Bank refers small business loans to Funding Circle[28] . As these platforms scale up in India, they might find themselves partnering with traditional banks to minimize competition and increase revenues.

The lack of regulation in this sector in India enables price discrimination to this industry to a greater extent. For example, in Australia, a suggestion was made to make comprehensive credit reporting mandatory[29]. Implementing a similar measure in India would ensure that screening methods are improved, giving access to more information about borrower's credit history. This can reduce the degree of asymmetric information in the market which can decrease the practice of price discrimination by lenders.

However, the regulation must be done with the objective of preventing unruly practices while simultaneously aiding the widespread adoption of technology in the nation. For online P2P platforms to truly become disruptive in the lending sector, they must target small enterprises in the country. A majority of the small enterprises in the nation do not have access to institutional credit which opens up opportunities for P2P lending start-ups[30].

---

[27] Hugh Son, "JPMorgan Working With On Deck to Speed Small-Business Loans," Bloomberg.com, last modified December 01, 2015, accessed January 15, 2018, https://www.bloomberg.com/news/articles/2015-12-01/jpmorgan-working-with-on-deck-capital-for-small-business-loans.
[28] Jonathan Moules,"Santander in peer-to-peer pact as alternative finance makes gains," Financial Times, last modified June 18, 2014, accessed January 15, 2018, https://www.ft.com/content/b8890a26-f62a-11e3-a038-00144feabdc0.
[29] "Government response to Australia's FinTech priorities," Australian Government Department of Treasury, accessed January 15, 2018, http://fintech.treasury.gov.au/government-response-to-australias-fintech-priorities/.
[30] "Easy access to credit: Challenges faced by SMEs and Micro SMEs," Faircent, Last Modified September 19, 2016, accessed February 14, 2018, https://www.faircent.com/easy-access-to-credit-challenges-faced-by-smes-and-micro-smes.

3. Conclusion

In answering the research question- **"To what extent does price discrimination affect the cost of borrowing in the online peer-to-peer (P2P) lending market in Hyderabad?"**, the hypothesis made was that first-degree and third-degree price discrimination exists in the market whereas second-degree price discrimination does not exist.

The practice of setting a different interest rate for every borrower on characteristics such as need, credit-rating and loan amount has led to price discrimination. There is no clear evidence pointing towards the practice of complete first-degree price discrimination due to lenders inability to find either the maximum ability or willingness of each individual borrower to pay. However, it only exists partially and the existence of asymmetric information may have hindered the practice of this form of price discrimination in this market.

Data supports the existence of second-degree price discrimination with interest rate decreasing with increasing loan amounts, hence proving the hypothesis wrong. The cost of borrowing, however, may rise as the increase in loan amount would not be balanced by decrease in interest rates.

Third-degree price discrimination on the basis of need and credit rating is the most prevalent form of price discrimination in the market, proving the hypothesis right. The difference in elasticities of demand contribute to significant difference in interest rates as a high proportion of borrowers are in dire need of credit with little options available to them.

The essay was based on the assumption that the concepts of price discrimination which is usually practiced by firms selling goods and services would apply to a financial asset market. This may have had its limitations as the supply for loans do not follow similar costs as the other goods and services and the returns gained by lenders are not the same as the profits gained by traditional firms. The company records only had details about 158 loans disbursed, which limited the scope of investigation due to a smaller population size. The cost of borrowing changes if the loan tenure changes as interest rate yields returns per annum, hence it was vital to set the loan tenure as constant to 12 months throughout the investigation which further limited the population size.

Price discrimination was not proven through lens of lenders with regard to the factors such as loan amount, need of the loan and borrower's monthly income that are used by them to determine interest rates for specific borrowers. Further, the effect of loan tenure and borrower's monthly income in determining interest rates is left unanswered which can be a major factor.

This opens up avenues for further research to generalize existence of price discrimination in P2P lending platforms in markets across the world. This gives insight into the behaviour of lenders and borrowers in the market, and can further lead to evidences in establishing the market structure of alternative lending platforms.

As the Fintech sector evolves and online P2P lending platforms become more widespread, the amount of available data increases, enabling researchers to evaluate the role of these platforms in disrupting financial markets. Research can be expanded to determine the competitiveness in this market and to establish trends in the loans disbursed using this platform which will aid all the stakeholders in the market by making them more informed about the loan processes.

4. Bibliography

4.1 Books

1. Tragakes, Ellie. Economics for the IB Diploma, Second ed. Cambridge University Press, 2012.

4.2 Online Journals

2. Chen, Ning, Arpita Ghosh, and Nicolas S. Lambert. "Auctions for social lending: A theoretical analysis." *Games and Economic Behavior 86* (2014): P. 367-391. https://web.stanford.edu/~nlambert/papers/Chen_Ghosh_Lambert_(GEB_2014).pdf

3. Dietrich, Andreas and Reto Wernli. "What Drives the Interest Rates in the P2P Consumer Lending Market? Empirical Evidence from Switzerland." SSRN Electronic Journal (2016). http://www.efmaefm.org/0EFMAMEETINGS/EFMA%20ANNUAL%20MEETINGS/2016-Switzerland/papers/EFMA2016_0240_fullpaper.pdf.

4. Duarte, Fernando, and Carlo Rosa. "The Equity Risk Premium: A Review of Models." *SSRN Electronic Journal* (2015). https://www.newyorkfed.org/medialibrary/media/research/epr/2015/2015_epr_equity-risk-premium.pdf?la=en.

5. Estrada, Dairo, and Paula Zamora. "P2P Lending and Screening Incentives." Journal of Economic Literature (2016). https://www.p2pfisy.com/wp-content/uploads/2017/04/Paper_31-min.pdf.

6. Milne, Alistair, and Paul Parboteeah. "The Business Models and Economics of Peer-to-Peer Lending." SSRN Electronic Journal, 2016. doi:10.2139/ssrn.2763682.

7. Roure, Calebe De, Loriana Pelizzon, and Paolo Tasca. "How Does P2P Lending Fit into the Consumer Credit Market?" *SSRN Electronic Journal* (2016). https://www.bundesbank.de/Redaktion/EN/Downloads/Publications/Discussion_Paper_1/2016/2016_08_12_dkp_30.pdf?__blob=publicationFile.

8. Varian, Hal R. "Chapter 10 Price discrimination." Handbook of Industrial Organization Handbook of Industrial Organization Volume 1 (1989). https://eclass.uoa.gr/modules/document/file.php/D404/Study%20Material/Varian_Price%20discrimination_IOHanbook_1989.pdf.

4.3 Websites

9. "Consultation Paper on Peer to Peer Lending." Reserve Bank of India – Database. Last modified April 28, 2016. Accessed August 03, 2017. https://rbi.org.in/scripts/Bs_viewcontent.aspx?Id=3164

10. "Easy access to credit: Challenges faced by SMEs and Micro SMEs." Faircent. September 19, 2016. Accessed February 14, 2018. https://www.faircent.com/easy-access-to-credit-challenges-faced-by-smes-and-micro-smes.

11. "Economic principles and problems-Micro Section 1: Monopolies." ECON 150: Microeconomics. Accessed July 27, 2017. https://courses.byui.edu/econ_150/econ_150_old_site/lesson_08.htm.

12. "FAQ'S." FAQ |Personal Loans, Online Money, Money Lenders| i-Lend. Last modified 2018. Accessed February 02, 2018. https://www.i-lend.in/faqs.html

13. "Financial Inclusion Data / Global Findex." Financial Inclusion Data. Accessed July 02, 2017. http://datatopics.worldbank.org/financialinclusion/country/india

14. Fintech in India- A global growth story. Report. KPMG in India and NASSCOM 10,000 Start-ups. Date published June, 2016. Accessed June 24, 2017. https://assets.kpmg.com/content/dam/kpmg/pdf/2016/06/FinTech-new.pdf

15. "Government response to Australia's FinTech priorities." Australian Government Department of Treasury. Accessed January 15, 2018. http://fintech.treasury.gov.au/government-response-to-australias-fintech-priorities/.

16. "Lending Policy." Peerlend.in. Accessed February 02, 2018. https://www.peerlend.in/P2P/LendingPolicy

17. Moules, Jonathan. "Santander in peer-to-peer pact as alternative finance makes gains." Financial Times. Last modified June 18, 2014. Accessed January 15, 2018. https://www.ft.com/content/b8890a26-f62a-11e3-a038-00144feabdc0.

18. Son, Hugh. "JPMorgan Working With On Deck to Speed Small-Business Loans." Bloomberg.com. Last modified December 01, 2015. Accessed January 15, 2018. https://www.bloomberg.com/news/articles/2015-12-01/jpmorgan-working-with-on-deck-capital-for-small-business-loans.

19. "Understanding CIBIL: Functions, Product and Service | CIBIL." TransUnion. Accessed February 03, 2018. https://www.cibil.com/faq-brochure.

20. Yogitha Khatri. "P2P lending: A new opportunity for investors eyeing regular income." Economic Times. Last modified October 05, 2016. Accessed August 3, 2017. http://economictimes.indiatimes.com/wealth/borrow/p2p-lending-a-new-opportunity-for-investors-eyeing-regular-income/articleshow/54691315.cms

5. Appendices

Appendix 1

Formula to calculate sample size from population size, obtained from
www.surveymonkey.com

$$\text{Sample Size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1+\left(\frac{z^2 \times p(1-p)}{e^2 N}\right)}$$

Population Size = N, Margin of error = e, z-score = z

Appendix 2

Borrower Survey

1. Borrower Name

2. Borrower ID

***3. Did you receive your loan at, or below an interest rate that you sought a loan for?**

- Yes
- No

4. Why did you choose to apply for a loan through i-lend than a bank?

- Bank Denied a loan
- Higher convenience
- Lower interest rate than private lenders
- CIBIL issues
- Try i-lend

Other (please specify)

5. On a scale of 1-5, how much was your need for the loan at the time of applying for it?

Very low	Low	Medium	High	Very High

6. How many interest points higher would you be willing to pay for the loan that you sought?

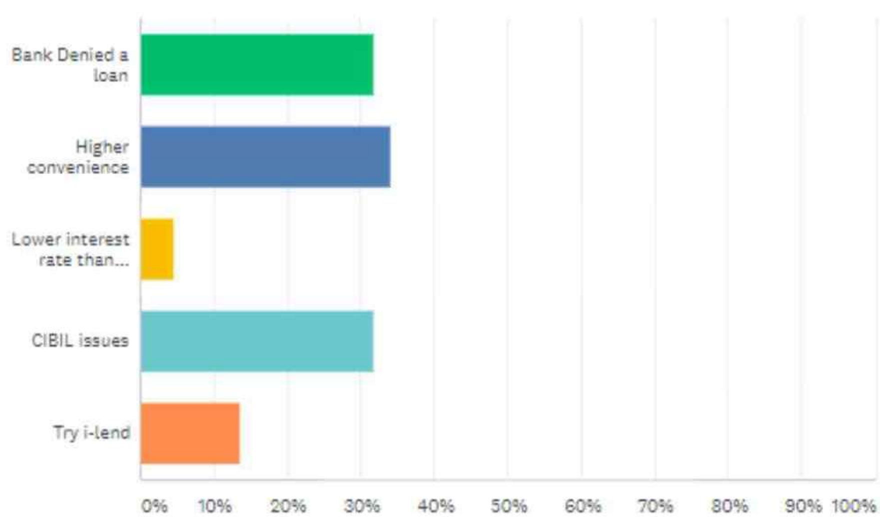
- 0%
- Till 1% more
- Till 2% more
- Till 3% more
- Till 4% more
- Till 5% more
- More than 5%

7. If you were to borrow a loan of higher amount, do you think the interest rate should increase, decrease or stay the same?

- Increase
- Decrease
- Same

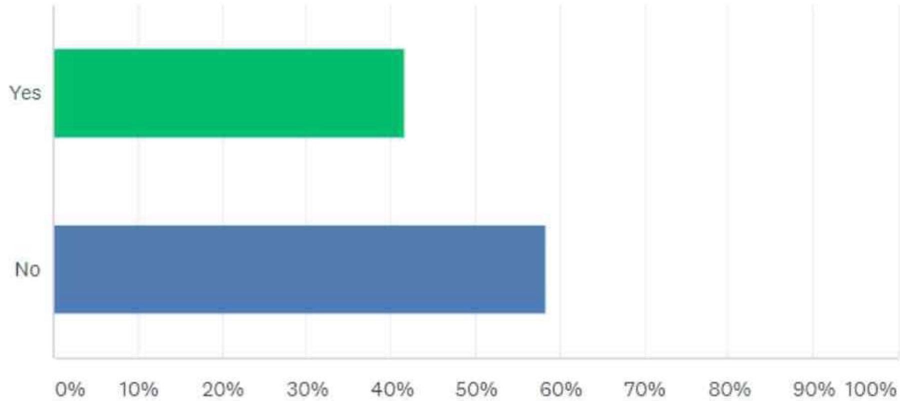
Appendix 3

Reasons for choosing an online P2P lending platform.



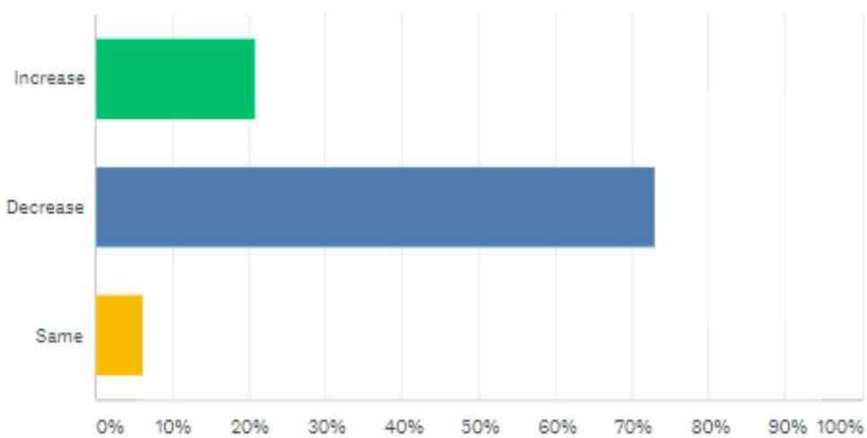
Appendix 4

Was the loan received at or below the expected interest rate?



Appendix 5

If loan amount increases, interest rate should?



Appendix 6

Average interest rate and standard deviation calculation

Borrower ID	Avg. Interest	Loan Amount (in INR)	Tenure (in months)	Risk rating
B12053100024	22.5	200000	18	
B12053100036	24	100000	12	
B12053100040	18.5	25000	6	
B12053100042	12	75000	12	
B12053100056	15	35000	12	
B12053100059	21.2	125000	18	
B12060100067	22.13	75000	12	
B12060100069	22.4	150000	24	
B12060500088	12.75	30000	6	
B12080700203	16	30000	12	
B12082400304	24	35000	12	
B12082700399	18	25000	12	
B12090500465	21	60000	12	
B12111400600	24	25000	12	
B12123100656	20	200000	6	
B13040300100	13.8	25000	12	
B13040400101	17.33	45000	6	
B13071500261	15.96	30000	12	
B13072600278	24	35000	12	
B13090200347	17.38	80000	12	
B13092500404	18.2	25000	12	
B13100800423	18	50000	12	
B13110600501	21.2	25000	12	
B13111200517	20.5	40000	12	
B14051300207	24	100000	12	
B14061700301	21.04	60000	12	
B14061700308	18.8	2500000	18	
B14061700309	19.25	1000000	12	
B14061700310	18	1000000	12	
B14061700311	15	500000	12	
B14061700312	18	1200000	12	
B14061700313	18	925000	12	
B14062300336	23.07	150000	12	
B14071700416	19.6	50000	12	
B14080500478	18	100000	18	
B14080600479	24	175000	12	
B14081300523	21	80000	12	
B14082600563	24	50000	12	
B14092300683	24	35000	12	
B14101500750	24	55000	12	
B14101700764	21	125000	12	Medium
B14102200778	24	30000	12	
B14110700807	20	200000	18	
B14110700815	23	60000	12	
B14110700816	19.75	75000	12	

B14111000823	24	300000	18	
B14111400851	22	2500000	18	
B14111400852	18	1900000	12	
B14112400901	24	50000	12	
B14120601051	23.07	75000	12	
B14121501119	24	50000	12	
B15011200037	18	400000	12	
B15041400481	18.75	40000	12	
B15052500725	18	95000	12	
B15052500728	18	115000	12	Medium
B15070700940	24	65000	12	High
B15072301034	22.25	150000	24	Medium
B15080401094	18	50000	24	Low
B15082101217	22.71	140000	12	
B15082401242	23.8	50000	12	High
B15091701435	24	40000	12	High
B15120102022	12	50000	12	
B15123102249	16	200000	12	
B15123102250	16.5	200000	12	
B15123102251	15	500000	12	
B15123102252	17	500000	36	
B15123102253	18	200000	6	
B15123102254	19	200000	12	
B15123102255	21	200000	6	
B15123102256	16.5	200000	6	
B15123102257	20	300000	12	
B15123102258	22.5	300000	6	
B16010900073	23.43	35000	12	High
B16012500226	20.91	40000	18	
B16012700260	23	15000	12	Medium
B16021400444	22.67	200000	12	High
B16021600468	22.85	65000	12	Medium
B16021900490	22.5	50000	18	Medium
B16022800572	23	20000	12	High
B16022900601	22.93	150000	18	
B16032200807	24	50000	12	High
B16040600902	22.25	40000	12	Medium
B16041801002	22.91	55000	12	Medium
B16042501043	22	30000	12	Medium
B16042801083	24	100000	24	Medium
B16050201168	22.69	40000	12	
B16050201184	20.63	80000	12	Medium
B16050201194	22.68	85000	12	
B16050401267	20.75	40000	18	Medium
B16051301408	24	30000	12	High
B16051601448	23.5	40000	12	High
B16052401533	15.6	25000	6	
B16060300017	24	35000	12	High
B16060401637	21.96	60000	12	Medium
B16060501644	23	50000	12	Medium

B16060501647	22	60000	12	Medium
B16060601657	21.5	50000	12	Medium
B16062901858	20.96	150000	24	Medium
B16070701945	24	25000	12	Medium
B16070801953	24	100000	12	
B16071001965	23.27	55000	12	Medium
B16071302001	22.56	65000	12	Medium
B16072302079	23.44	80000	12	High
B16080402176	23	40000	12	High
B16081702278	24	55000	6	Low
B16083002377	22.33	60000	12	High
B16090302416	17.33	30000	6	
B16091302506	23.47	150000	24	Medium
B16091902547	23.67	40000	12	High
B16091902549	23.5	40000	12	High
B16092102561	22.21	60000	12	Medium
B16092602595	21.43	120000	12	Medium
B16100502667	22.2	60000	12	Medium
B16101502758	23.85	65000	12	High
B16102202811	23	70000	12	High
B16111402957	23.5	15000	12	High
B16111502969	21	50000	12	Medium
B16112203011	22.4	100000	12	High
B16112703048	24	45000	12	High
B16120503090	24	65000	12	Medium
B16121003126	24	25000	12	Medium
B17011100084	21.5	100000	12	Medium
B17011200094	22.5	85000	12	Medium
B17011900149	21.75	35000	12	Medium
B17012300167	21.5	100000	12	Medium
B17012400183	23.14	35000	12	Medium
B17020900338	21.5	100000	12	Medium
B17021000350	23.65	50000	12	Medium
B17021100363	23	10000	12	High
B17021200367	22	80000	12	Medium
B17022300138	24	40000	12	Medium
B17030600039	22.8	125000	12	Medium
B17030700047	23.32	90000	12	Medium
B17030800057	24	35000	12	Medium
B17033100097	24.05	80000	12	Medium
B17040300009	23.11	45000	12	Medium
B17040900116	21	20000	6	Medium
B17042100271	20	175000	12	Medium
B17050400023	24	40000	12	Medium
B17050700023	24	45000	12	Medium
B17051000052	21	60000	12	Medium
B17051300023	23.52	125000	24	Low
B17051500051	24	50000	12	Medium
B17051700067	24	50000	12	Medium
B17051700072	21.11	45000	12	Low

B17060100002	21.38	80000	12	Medium
B17060600039	24	40000	12	Medium
B17061000082	19.9	50000	12	Low
B17061700150	27	30000	12	Medium
B17061800153	24	40000	12	Low
B17070100001	29.33	30000	12	Medium
B17070100009	21	100000	12	Low
B17070400029	24	20000	6	Low
B17070500055	28.8	50000	6	Medium
B17071200136	24.6	90000	24	Low
B17071500191	24	25000	12	Medium
B17071900275	20	30000	6	Medium
B17072600037	24.75	40000	12	Medium
Average interest rate	21.49702532			
Standard deviation	2.981852816			

EE/RPPF

For use from May/November 2018

International Baccalaureate
Baccalauréat International
Bachillerato Internacional

Candidate personal code:

Extended essay - Reflections on planning and progress form

Candidate: *This form is to be completed by the candidate during the course and completion of their EE. This document records reflections on your planning and progress, and the nature of your discussions with your supervisor. You must undertake three formal reflection sessions with your supervisor: The first formal reflection session should focus on your initial ideas and how you plan to undertake your research; the interim reflection session is once a significant amount of your research has been completed, and the final session will be in the form of a viva voce once you have completed and handed in your EE. This document acts as a record in supporting the authenticity of your work. The three reflections combined must amount to no more than 500 words.*

The completion of this form is a mandatory requirement of the EE for first assessment May 2018. It must be submitted together with the completed EE for assessment under Criterion E.

Supervisor: *You must have three reflection sessions with each candidate, one early on in the process, an interim meeting and then the final viva voce. Other check-in sessions are permitted but do not need to be recorded on this sheet. After each reflection session candidates must record their reflections and as the supervisor you must sign and date this form.*

First reflection session

Candidate comments:

After a rigorous process of selecting topics of interest, I had chosen contract farming in the chilli industry as my area of focus. However, due to logistical issues, I had to change my topic. As I interned with an Online P2P firm during the summer, I decided to have my Extended essay revolve around this industry. The high variance in interest rates motivated me to focus on price discrimination in the market. I have developed a research question after reading through a range of journals and articles with regard to the Fintech industry and price discrimination. By using the Extended essay guide as a reference, I have conceptualized the ideas on which my Extended essay will be based upon. I have decided to use surveys to obtain my primary data form borrowers. There are challenges in linking to the cost of borrowing to price discrimination which I intend on exploring further.

DES

Date: 23-04-2017

Supervisor initials:

International Baccalaureate
Baccalauréat International
Bachillerato Internacional

Interim reflection

Candidate comments:

There were a few difficulties in conducting the interviews such as I was unable to reach a few phone numbers and two of them refused to be part of the interview. However, I was able to conduct the interviews with 48 borrowers and gain sufficient primary data for analysis. The data obtained validates my research question and will enable effective analysis. The process was lengthy and there were a few barriers which I overcame with the help of my father and my Extended essay supervisor. I had to replace surveys with telephonic interviews as the policy of the firm from where I am getting data forbids the sending of surveys. Hence, I had to replace the questionnaire with an interview transcript. I have started writing the introduction and theory part of my EE with the help of online resources and journals. I am aware of the format of the extended essay as I constantly refer to the Extended essay guide.

SEEN

Date: 31-08-2017

Supervisor initials:

Final reflection - Viva voce

Candidate comments:

All my resources have been documented in the bibliography section. I initially had difficulties in citing my resources but I overcame those with the help on tutorials and EE mentor. The feedback from my mentor was crucial in better structuring my essay and guiding me through my data collection process. Following the completion of my extended essay, I gained a better understanding of the functioning of alternative lending markets. It was a new medium of hands-on learning for me as I actively engaged myself in research and gained a deeper understanding of various economic concepts. As I had both primary data and secondary data, I was able to improve the validity of the results obtained from my research. Through this process, I improved my written communication skills by framing cohesive arguments and developing my analysis for them. I also learnt about managing my time well and completing each draft of my essay before the due date. My critical-thinking skills improved and I exposed myself to a few quantitative techniques that will be helpful for further research work in university.

SEEN

Date: 14-02-2018

Supervisor initials:

International Baccalaureate
Baccalauréat International
Bachillerato Internacional

Supervisor comments:

***Supervisor**: By submitting this candidate work for assessment, you are taking responsibility for its authenticity. No piece of candidate work should be uploaded/submitted to the e-Coursework system if its authenticity is in doubt or if contradictory comments are added to this form. If your text in the box below raises any doubt on the authenticity of the work, this component will not be assessed.*

In the first few meetings S came up with a clear plan for deciding on the topic and RQ. His first option was to work of contract farming, but as soon as he found that the topic had issues with respect to primary data collection. He moved to the present topic and RQ.
He made the choice of the present topic based on the back ground knowledge and understanding he gained through internship.
Through the process, he developed effective research skills, with a focused and clear research question that is apt to the topic.
The method and sources used for research is most appropriate for the requirement of the topic.
Through his presentation he clearly integrated the underlying the Economic theories with findings and analysis of the arguments.
Conclusions to individual points of analysis are supported with evidence from primary and secondary data .
The discussion section of the essay clearly demonstrates well-structured and coherent, reasoned arguments.
The essay effectively evaluates the P 2 P lending platforms and their role in financial markets in the country.
The candidate has also clearly identified the strengths and limitations of the research and findings in the conclusion section of the essay.
It is indeed been a unique and learning experience for me as supervisor to guide the candidate on a market that is emerging.
The passion with which the candidate has researched on the topic and clarity of approach and planning is worth commending.
In conclusion the candidate's engagement with the process is personal, his organisational skills are demonstrated through the documentation process

SEEN