SUMMARY

The visualization analyzes loan data obtained from Prosper. The loans originated from 2009 to 2014. This data set contains 113,937 loans with 81 variables.

In this project, because of my experience, I focused on the average amount delinquent, the current number of delinquencies, the average yield, the average Gross Principal Loss and Credit Grade.

I discovered that the average amount delinquent, increases with lower Credit Grade. I also discovered that the average amount delinquent, average Gross Principal Loss and the average Lender Yield all increase with the increase in the number of current delinquencies.

DESIGN

When deciding what data to choose for exploration, I thought of what will be interesting to know about each of the data presented. When I looked at the loan data, I thought it would be interesting for all lenders to know or be able to predict delinquencies prior to granting a loan. That will help the lender decide whether to grant loan to an individual. I work in the financial services industry and I understanding that some of the attributes that determine the credit worthiness of an individual are the credit rating as well as other factors included in the credit report. While credit rating is popularly used, it may not be the best or the sole determinant of the credit worthiness of an individual. So, I opt to use some attributes of credit reports like the number of delinquencies in the past, alongside the Credit Grade, in determining whether an individual will be able to repay a loan being granted or the individual will default.

The question will be at what threshold of prior delinquency should loan applications be declined? This depends on the lender. Usually, applicants that pose higher risk get higher interest rates if the loan is approved. This generates higher yield for the lender. Because of this, I have decided to investigate lender yield as well.

I created three visualizations: one was the Credit Grade Vs Loan Origination Amount and Amount Delinquent, second was Current Delinquency Vs Amount Delinquent and Lender Yield, the third was Current Delinquencies Vs Amount Delinquent and Gross Principal Loss.

Two of the three visualizations in the story are line charts. I chose this because I wanted to make comparison between the current delinquencies and the amount delinquent and gross principal loss in one chart and in the other chart, I wanted to see the comparison of

the amount delinquent and the lender yield with respect to the current delinquency. For this type of comparison, the best chart to use is the line chart.

The third chart was a scatter plot. This is because I wanted to show relationship between Credit Grade and Loan Original Amount as well as between Credit Grade and Amount Delinquent. I also needed to show the difference between the Delinquent Amount and the Loan amount for all the different Credit Grades.

Credit Grade Vs Loan Origination Amount and Amount Delinquent.

This visualization looks at the average Loan Origination Amount against the Average Amount Delinquent by the Credit Grade. For applicants with higher credit Grade, there is a big gap between the average amount delinquent and the average loan origination amount. As the credit grade drops, the difference drops until the credit grade gets to HR (High Risk) where the average delinquent amount exceeds the average loan origination amount. This may imply that for the individuals that falls into the High Risk grade, they usually are delinquent on loans and some of them may even get additional loans on top of the loan origination amount and end up delinquent on them. It may also means that this group are usually delinquent on both the principal and the interest. Thus, it will not be advisable for any lender to grant loans to anybody that falls into the High Risk credit grade.

Current Delinquency Vs Amount Delinquent and Lender Yield

I chose line graph because it will show how the average Amount Delinquent and the Lender Yield change as the Current Delinquencies change. I used Dual axis in this chart but I didn't synchronize the axis.

Even though I mentioned above that it may not be advisable for lenders to grant loans to applicants which Credit Grade of High Risk, some lenders may still want to take the risk depending on the yield they would get from such high risk loans. This visualization looks at the average amount of delinquency and the average yield with respect to the number of current delinquencies.

I plotted the number of current delinquencies on the X-axis and both the average amount of delinquencies and the average lender yield on the Y-axis. It can be noted that the average amount delinquent increases as the number of current delinquencies increases. In the same way, lender yield also increases as the number of current delinquencies increases. The question is that at what threshold of current delinquencies will a lender choose to decline the loan? It depends on each lender. Looking at the chart, the trend line for both the average amount delinquent and the average lender yield are upward sloping but the trend line for the average amount delinquent is steeper. It is also worthy of note

that the average amount delinquent was relatively flat until the number of current delinquencies reaches 18, at which point, average amount delinquent jumped. This could be a threshold for some lenders but in setting the threshold, a lender needs to consider a lot of factors that will be determined by their business requirements.

Current Delinquencies Vs Amount Delinquent and Gross Principal Loss

I chose line graph because it will show how the average Amount Delinquent and the Gross Principal change as the Current Delinquencies change. I used Dual axis in this chart but I didn't synchronize the axis.

After having looked that the average amount delinquent and the yield, it is also needful to look at the average principal loss. While some lenders may want to grant some high risk loans, looking at projected principal loss may help them in making the right decision. This chart plots the number of current delinquencies on the X-axis and both the average amount delinquent and the average Gross Principal loss on the Y-axis. Both charts are also upward sloping. It is worthy of note that the average Gross Principal Loss is relatively flat until the current delinquencies reached 22 when it jumped from 15k to above 60k. That may also be a threshold for some lenders but as I mentioned earlier, thresholds will be different for different lenders.

Key stories from the exploration:

- There should be a direct relationship between credit rating and loan delinquency
- Loans to less creditworthy borrowers tend to have a much smaller spread (average loan origination Amount – Average Amount Delinquent) than loans to more creditworthy borrowers, based on the credit Grade. This is not far-fetched because lenders charge higher risk borrowers higher interest rates than lower risk borrowers. For such high risk loans, though the return or yield expected may be bigger, there is a greater risk of delinquencies.
- The threshold at which a lender decides to decline a loan depends on the lender and their risk averseness.

Feedback

After creating the visualization, I came the visualization in the link below (https://public.tableau.com/profile/temitayo.ilori#!/vizhome/PLDataV1/Dashboard1?publish=yes), and I received the following feedback from my friend, who is not an expert in visualizations. The feedbacks are the follow:

- It is difficult to know what each color denotes in the Current Delinquency Vs Amount Delinquent and Lender Yield as well as the Current Delinquencies Vs Amount Delinquent and Gross Principal Loss
- It is also difficult to know that the various listing categories denote in the treemap.

So, I decided to create a story instead of a dashboard. With the story, there is only one visualization on a page and it is therefore more visible what the different colors denote. Also, I removed the treemap from the visualization.

After this, I arrived the the visualization below(https://public.tableau.com/profile/temitayo.ilori#!/vizhome/PLDataV2/DelinquencyStory?publish=yes)

Resources

- Udacity Classroom Materials
- Tableau