



Udacity EDA Project

Part II - Prosper Loan Data Presentation - Varied impacts on borrower interest rates.

By Thayne Campbell



Investigation Overview

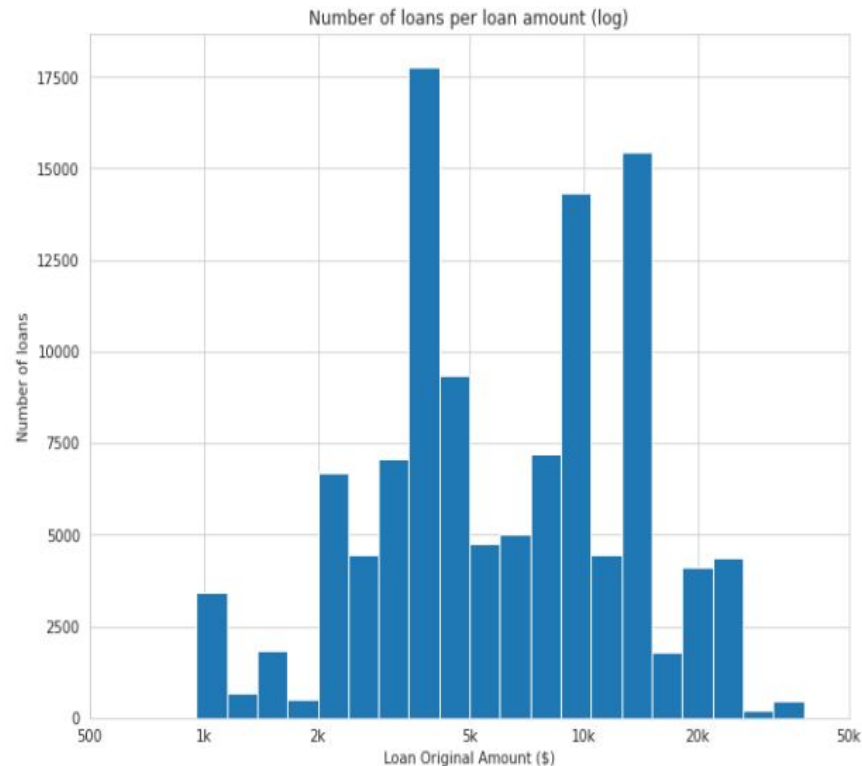
Through this presentation, I plan to explore the key factors that affect a borrower's potential interest rate on their loan. These key factors include income range, type of loan, and loan amount. I will also explore the impact of being a HomeOwner when it comes to borrowing.

Dataset Overview

This data set contains 113,937 loans with 81 variables on each loan, including loan amount, borrower rate (or interest rate), current loan status, borrower income, and many others from 2005 to 2014.

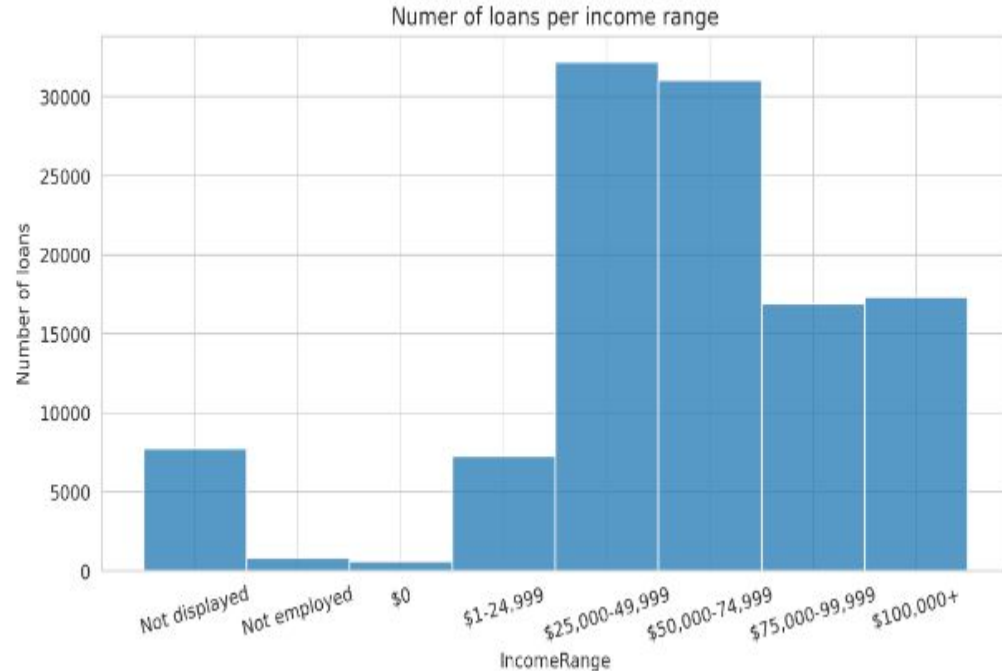
Distribution of loan amounts

The original loan amounts in this data set range from 1000 to about 35,000. Due to the bulk of loans being around the 5000-15,000 range, I transformed the data to a log scale to get a better look at the distribution, revealing a *somewhat* bimodal distribution.

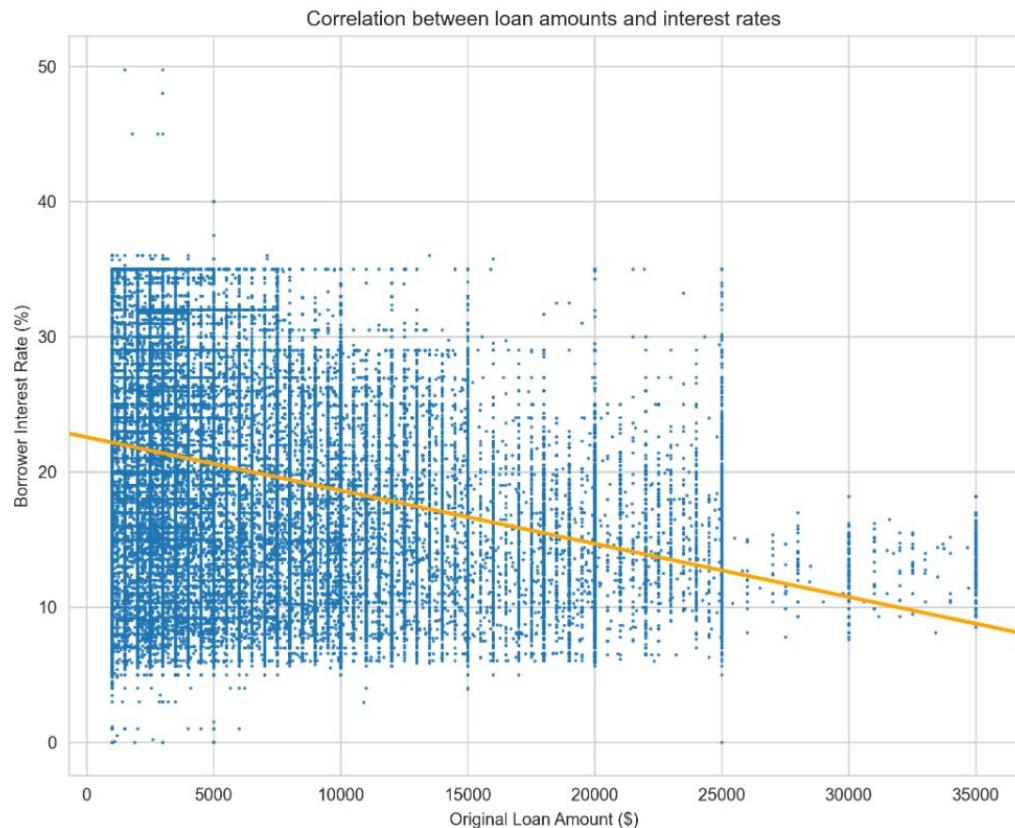


Distribution of loans based on income range

The bulk of loans taken out were by borrowers who fell into the 25K-75K dollar income range, with over 60,000 loans taken out. The 75K+ income ranges account for just over half of that amount.



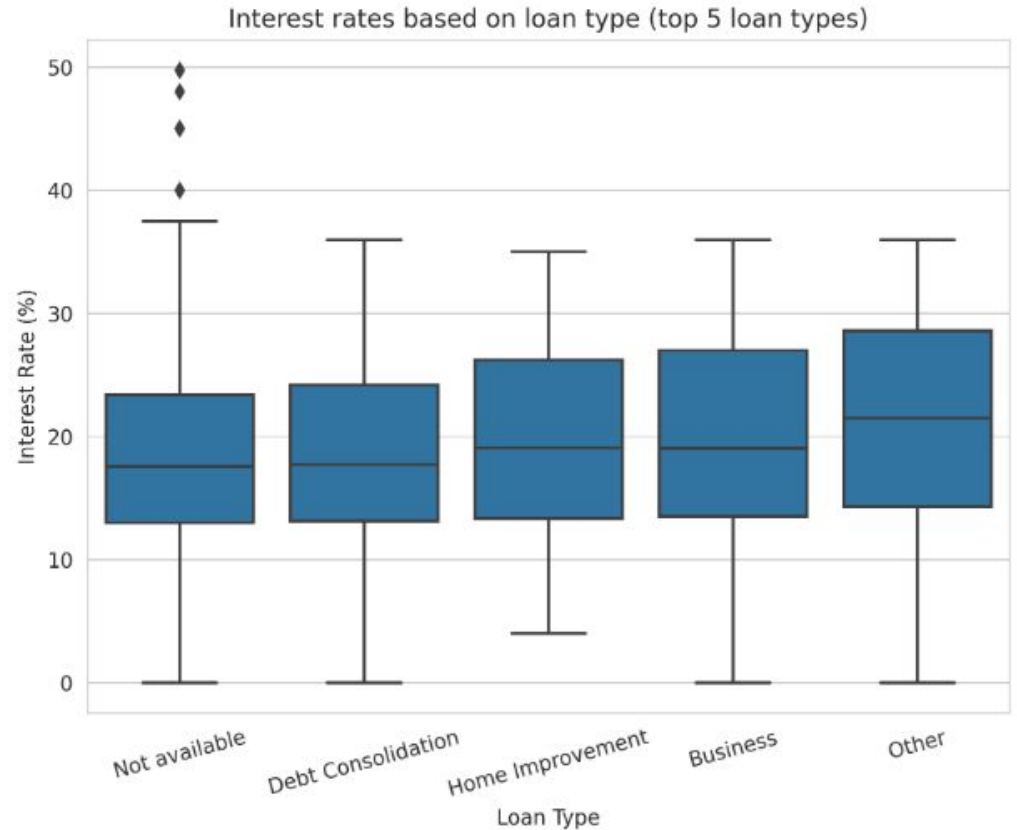
Relationship between interest rates and loan amounts



Next, I wanted to explore the correlation between interest rates and loan amounts. Here we can see a negative correlation between the two, showing that higher dollar loan amounts typically will incur lower interest rates.

Interest rate VS loan type

Here we see that the type of loan on it's own doesn't seem to have too large an effect on interest rates, with the median interest rate between all loan types hovering around the 20% mark. There are a few outliers under the "Not available" loan type, however further insight into these loans is not available in this dataset.

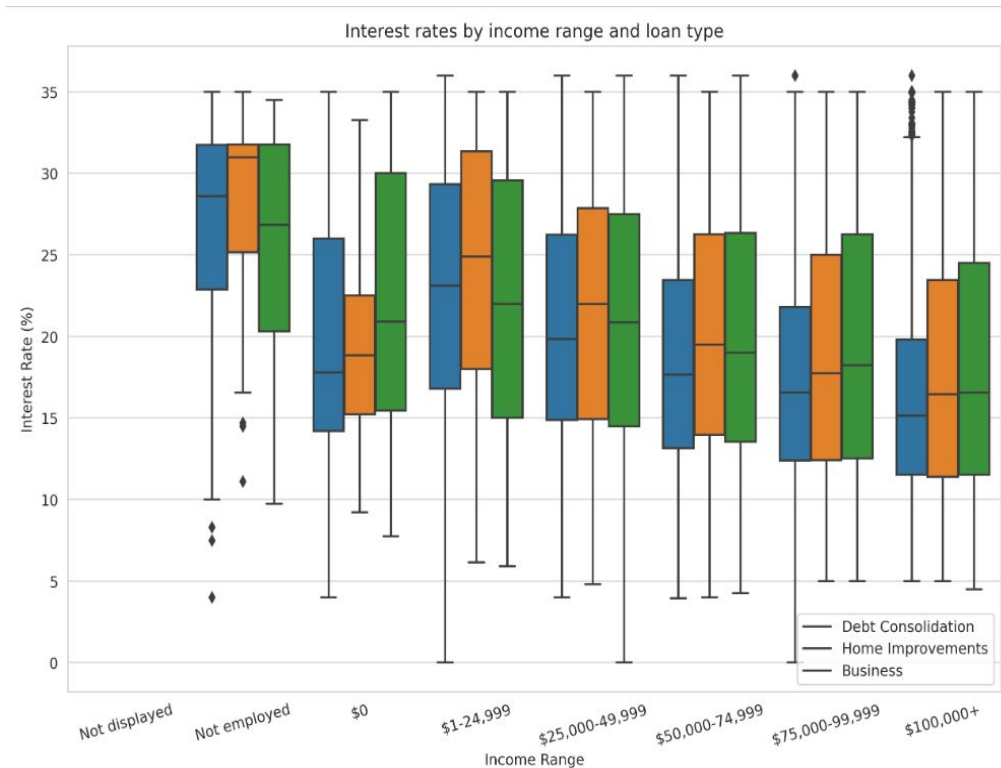


Interest rates based on loan type & income range

Now we get a clearer picture of the relationship between income ranges, loan types, and interest rates. There are two things that stick out to me here; namely the outliers. It looks like, while borrowers who are not employed usually see a higher interest rate (between roughly 21% and 32%), there are some exceptions in the outliers that come in at a much lower interest rate (between roughly 4% and 14%).

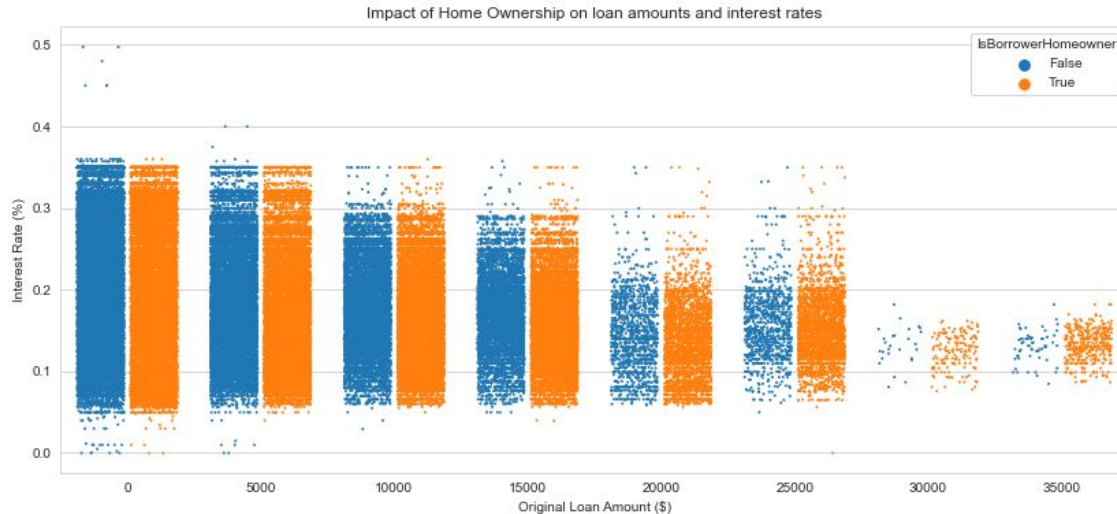
Contrarily, borrowers in the 100k+ income range, while mostly enjoying much lower interest rates when compared to the other income ranges, see a number of outliers ranging between 33%-37%, specifically in the debt consolidation loan type.

Another thing worth noting is that it seems as though debt consolidation loans almost always have a lower interest rate applied to them when compared to business and home improvement loans. It's interesting to see how the interest rates for home improvement loans start to creep below the rates of business loans as you move up through the income ranges.



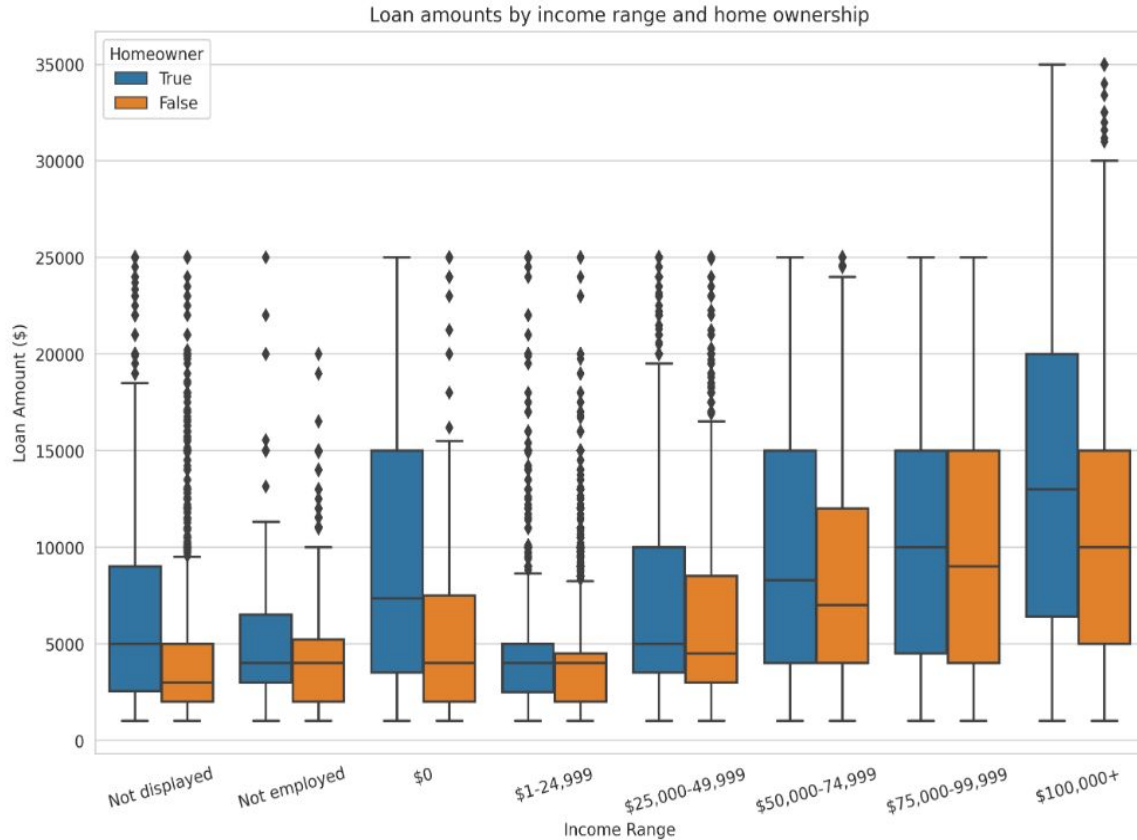
Home Ownership - does it count for anything?

Having a look at the relationship between borrower interest rates and loan amounts as we did before, but with the distinction of home ownership, we can see that before the 15k loan amount, there doesn't seem to be much of a distinguishable difference in interest rates. We can see that as the loan amount rises above 15k, we do see lower interest rates, but we also see fewer loans given to those who are not homeowners.



Loan amounts based on home ownership

I wanted to get an even closer look into the details of home ownership and its implications towards loans granted. Here we get a bit of a better picture of how home ownership is related to loan amounts. Consistently, home owners tend to take out larger loans than those who do not own a home. One thing to note here is the big difference in the 0 income range. Homeowners here seem to enjoy a much larger loan amount against the non-homeowner. There is also a noticeable difference in the 100K income range in favor of homeowners. This reveals a stronger relationship than we've previously seen.



Thank you for your time!