



LOAN ANALYSIS  
*October 29, 2017*

# BUSINESS PROBLEM

- ❑ Lending Club's model for risk assessment categorizes borrowers by assigning them a grade and a subgrade based on their credit history.
- ❑ Investors are presented with a list of borrowers, along with their assigned risk assessment grades, and they have the opportunity to choose which borrowers they will fund, and the percentage of funding that they will cover.
- ❑ Our business problem is that investors require a more comprehensive assessment of these borrowers than what is presented by Lending Club in order to make a smart business decision, by identifying new borrowers that would likely default on their loans.

# DATA DESCRIPTION

- ❑ Lending Club provided us with 4 years of historical data (2007-2011). This dataset contained information pertaining to the borrower's past credit history and Lending Club loan information.
- ❑ Variables present within the dataset provided an ample amount of information which we could use to identify relationships and gauge their effect upon the success or failure of a borrower fulfilling the terms of their loan agreement.
- ❑ We required only the variables that had a direct or indirect response to a borrower's potential to default. To achieve this, we prepared the data by choosing select variables that would best fit this criteria.



# DATA CLEANING AND EXPLORATORY ANALYSIS

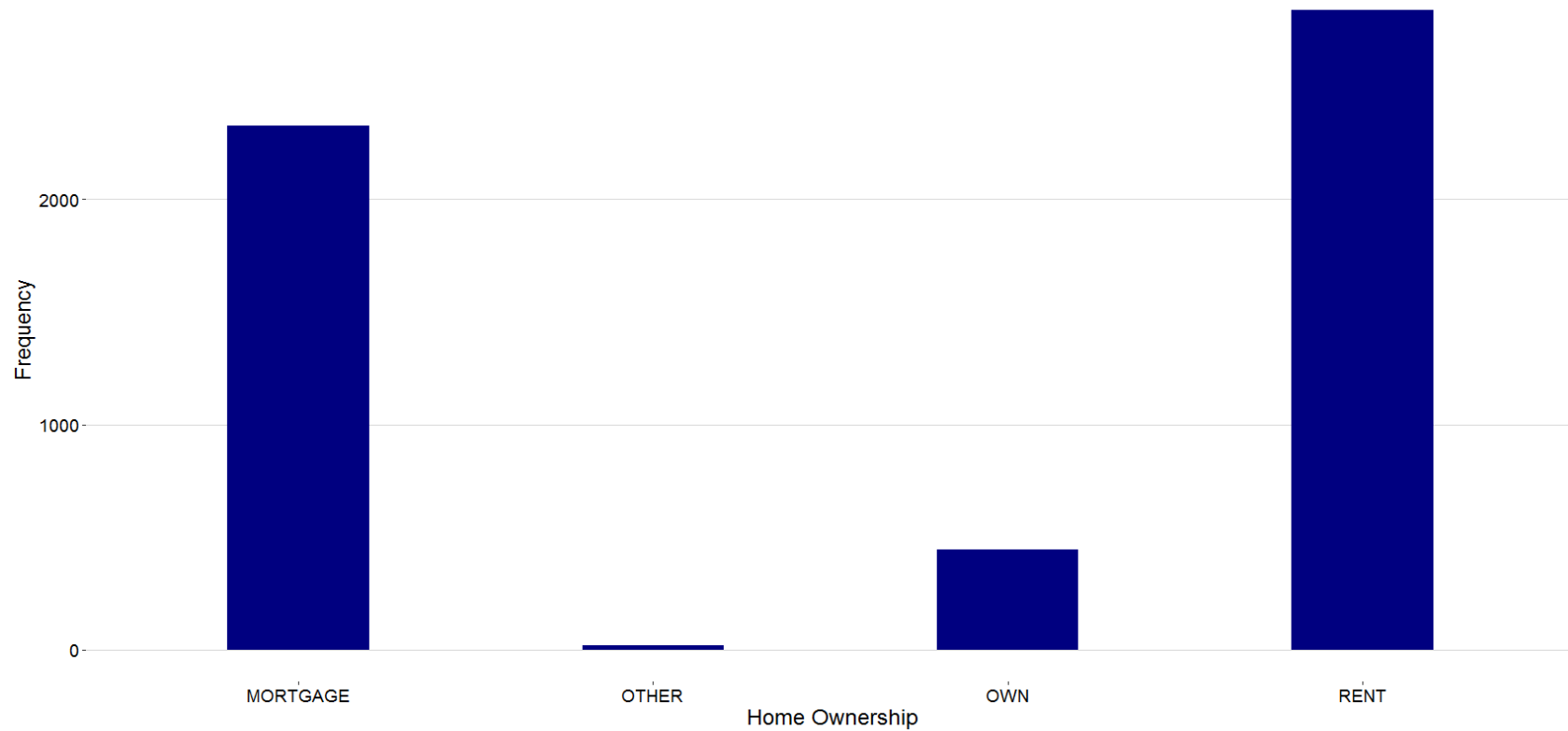
- ❑ Removed columns that obviously had no relation to the analysis in question (E.g. id, member\_id etc.)
- ❑ Removed columns that had bad quality data (i.e. missing values in observations (i.e. NA's, unintelligible values etc.)
- ❑ Removed columns that had identical relationships to the analysis in question (E.g. funded\_amnt and funded\_amnt\_inv as they are always the same as loan\_amt).
- ❑ Established derived columns from existing columns to facilitate model analysis (E.g. balance\_amt, also issue\_month & issue\_year from the issue\_d).
- ❑ Converted continuous variables to range of values to enhance interpretation of results (E.g. int\_rate, Annual\_income, balance\_amt etc.)



# UNIVARIATE ANALYSIS

# Home Ownership

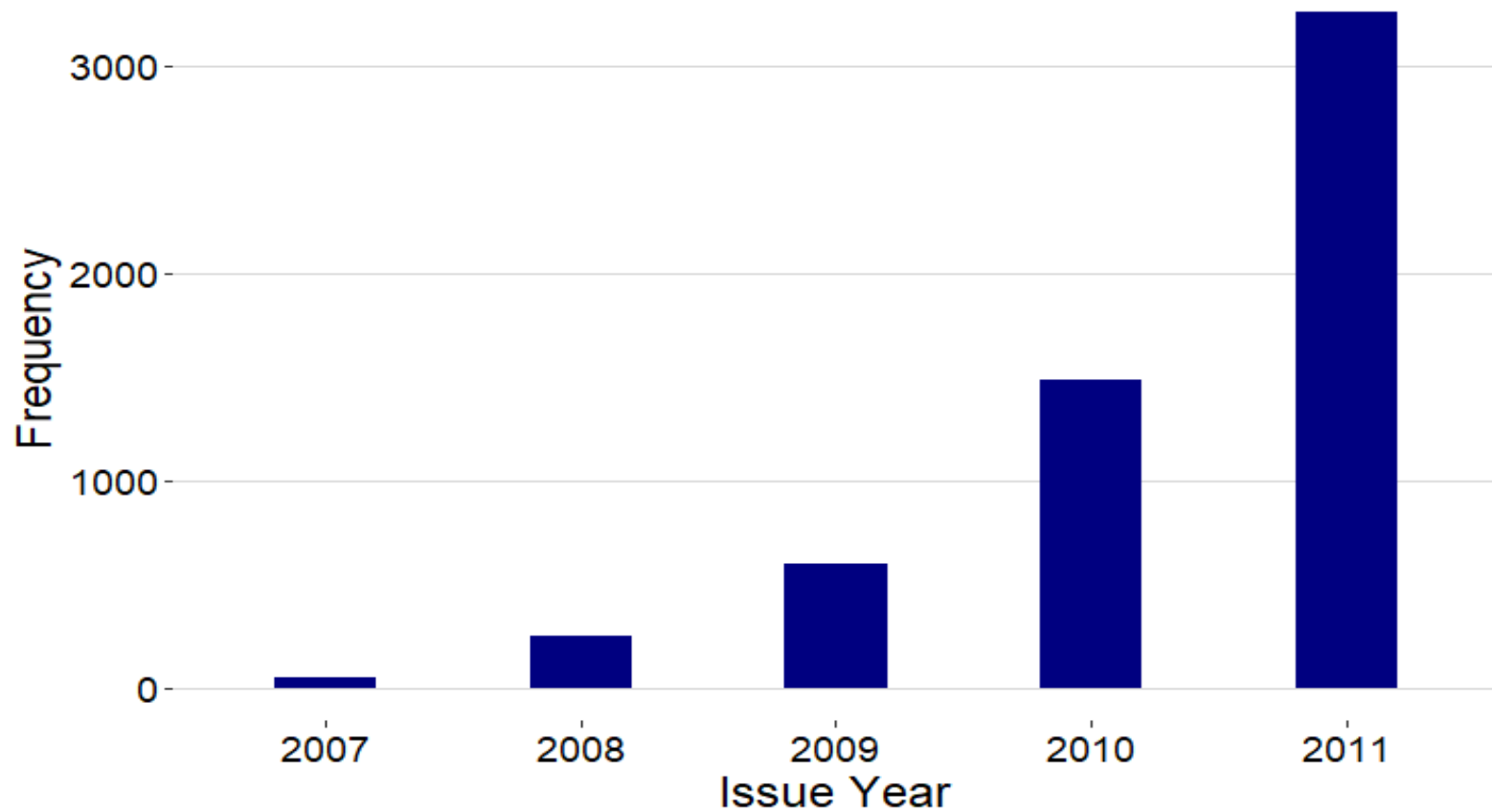
Charged Off frequency w.r.t Home Ownership



People having home either Rented or Mortgage having higher chances to be defaulter.

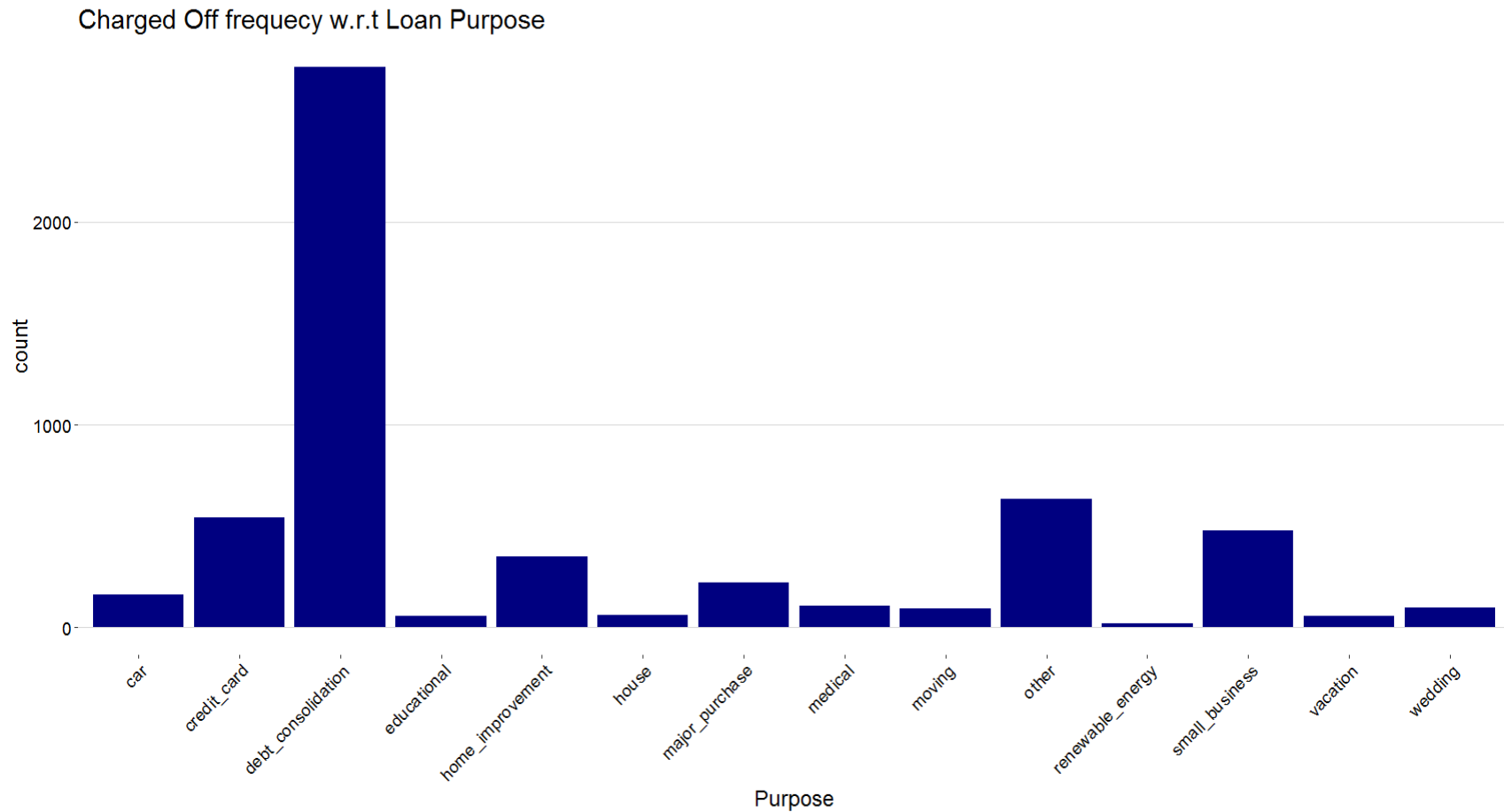
# Loan Issue Year

Charged Off frequency w.r.t Loan Issue Year



Increasing trend of charge off per Loan issue year.

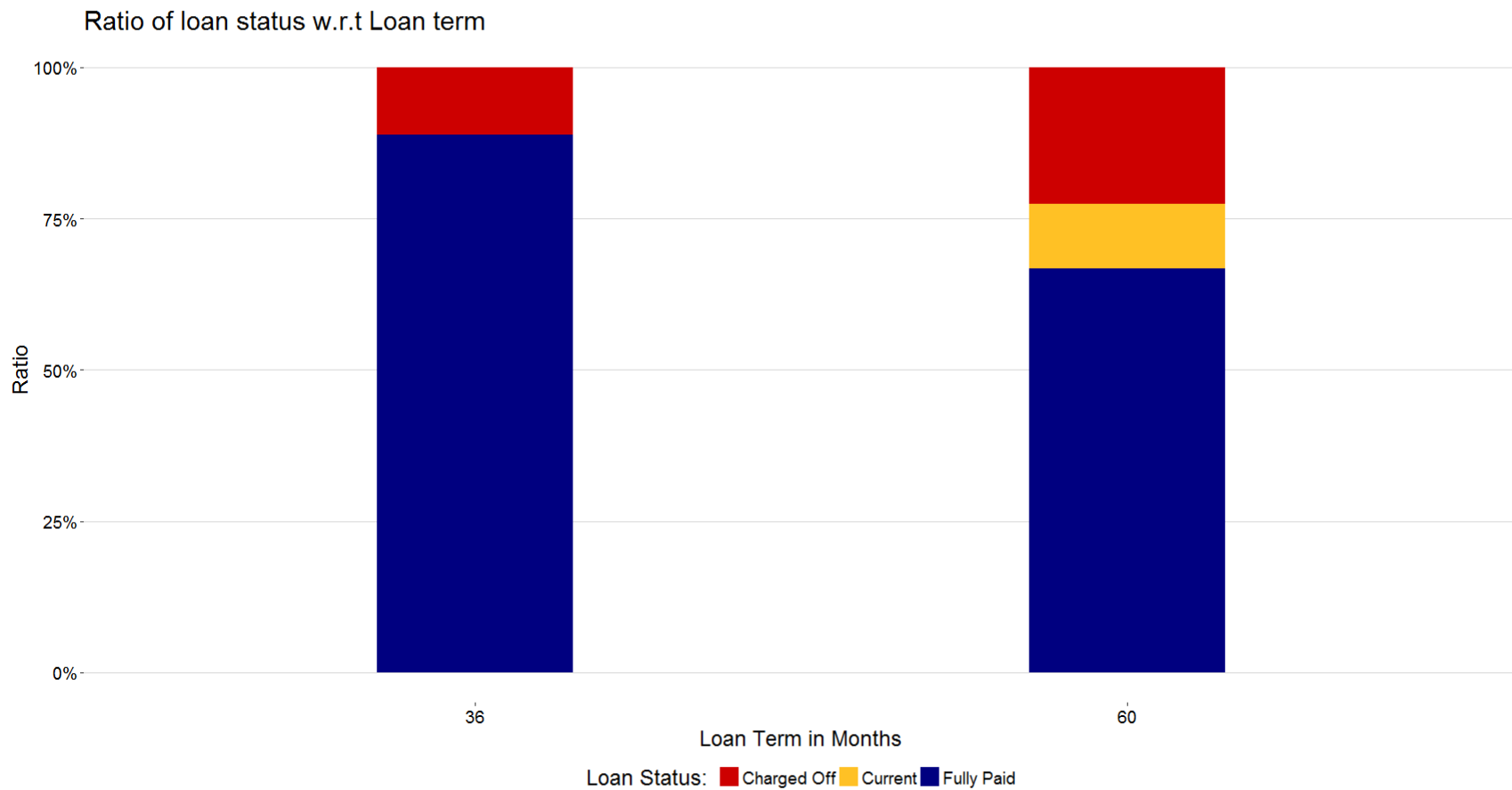
# Loan Purpose



More people have taken up the loan to resolve the previous/older debts.

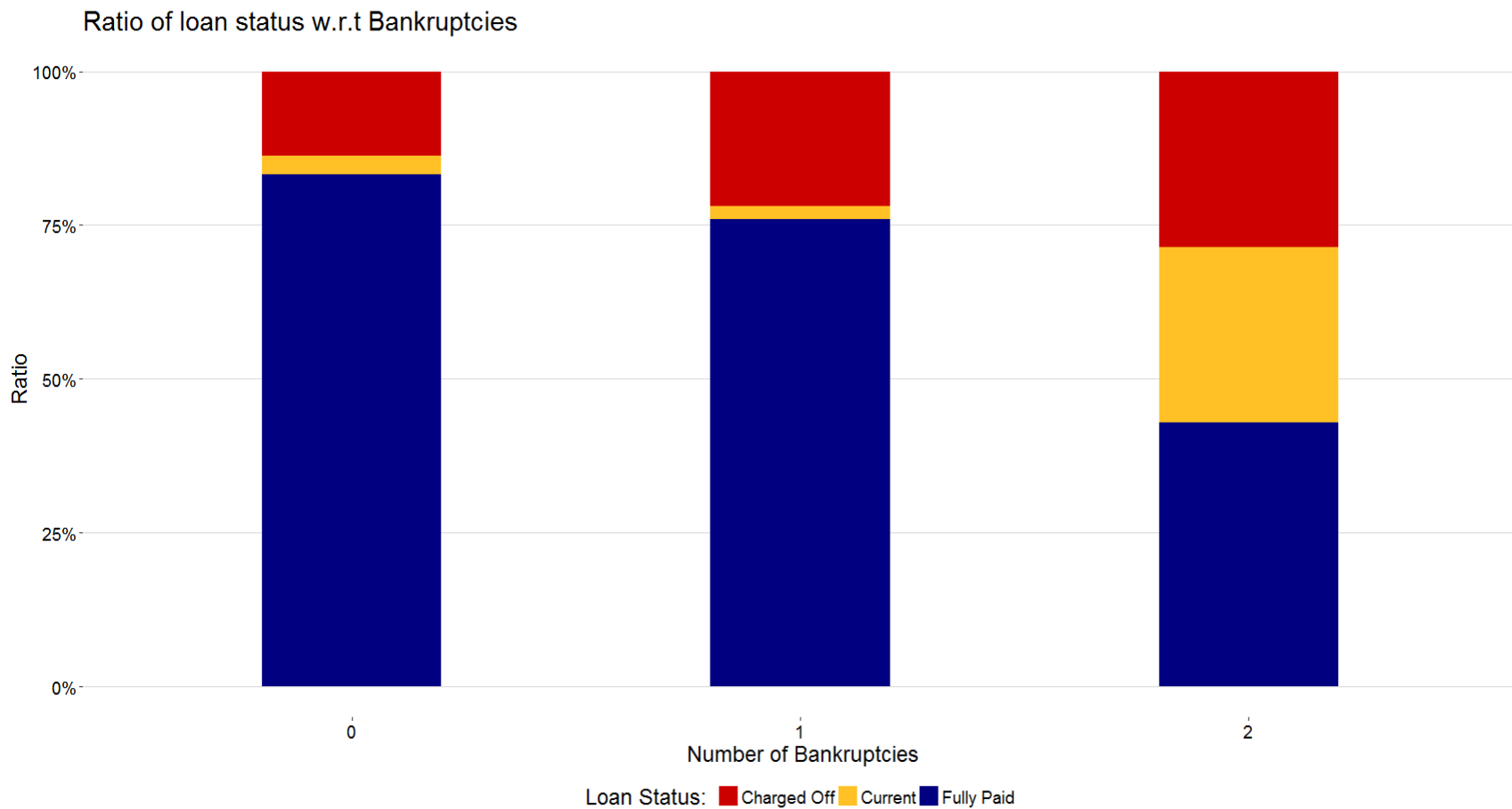


# Loan Term Trend



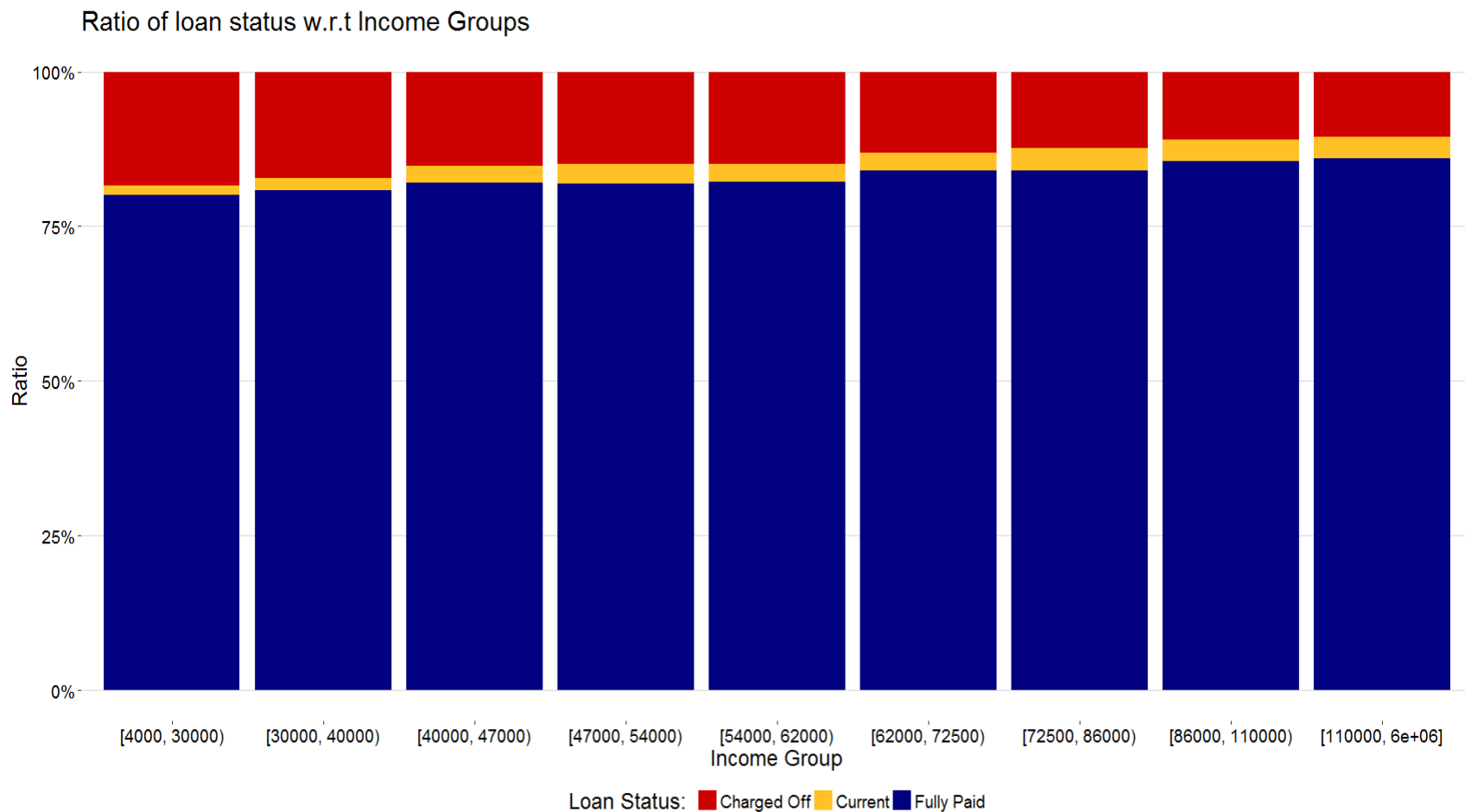
Long term loan yields more charge off.

# More Bankruptcies lead defaulter



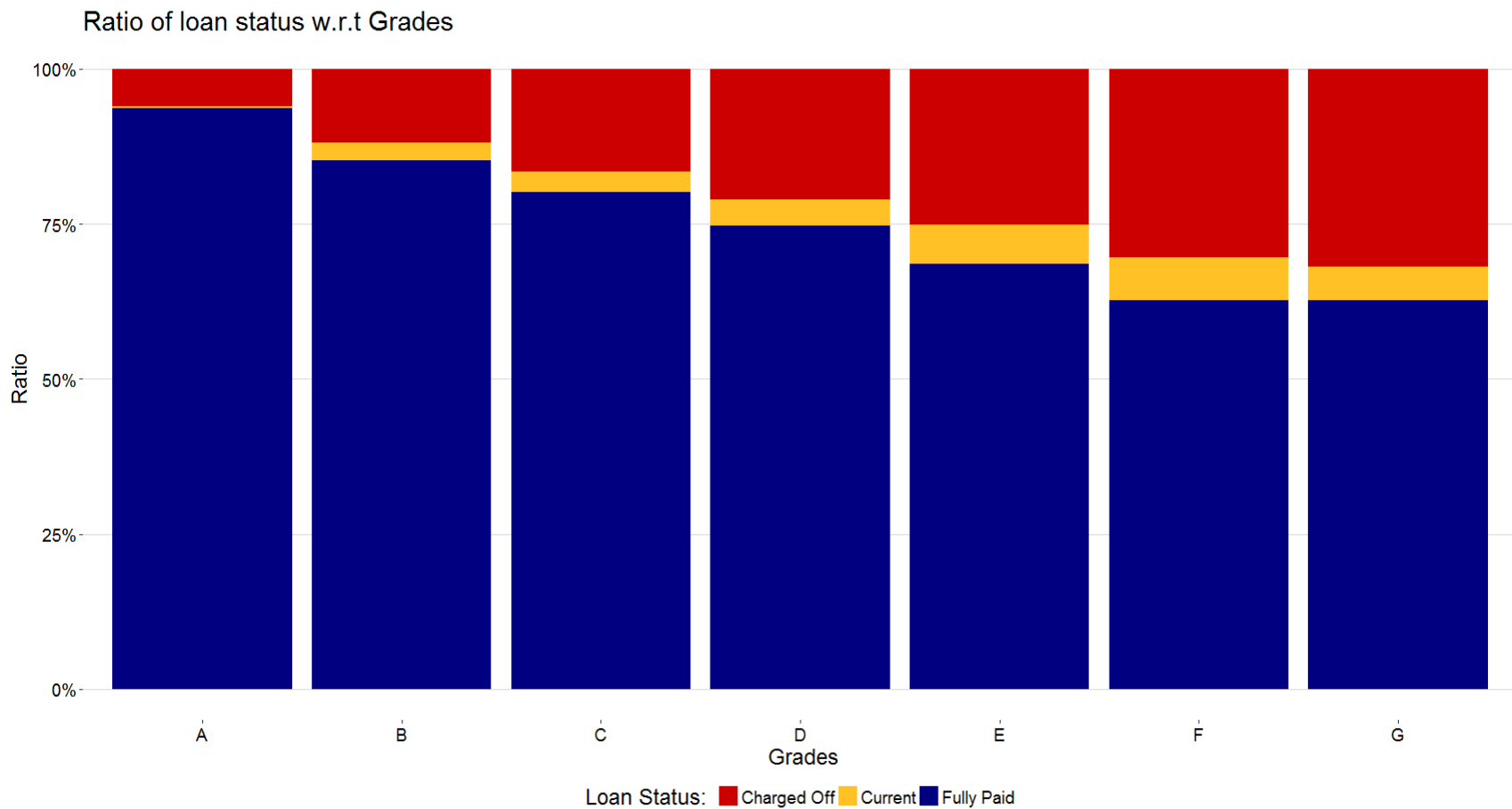
People with more bankruptcies in past not a good loan customer.

# Risky Income Group



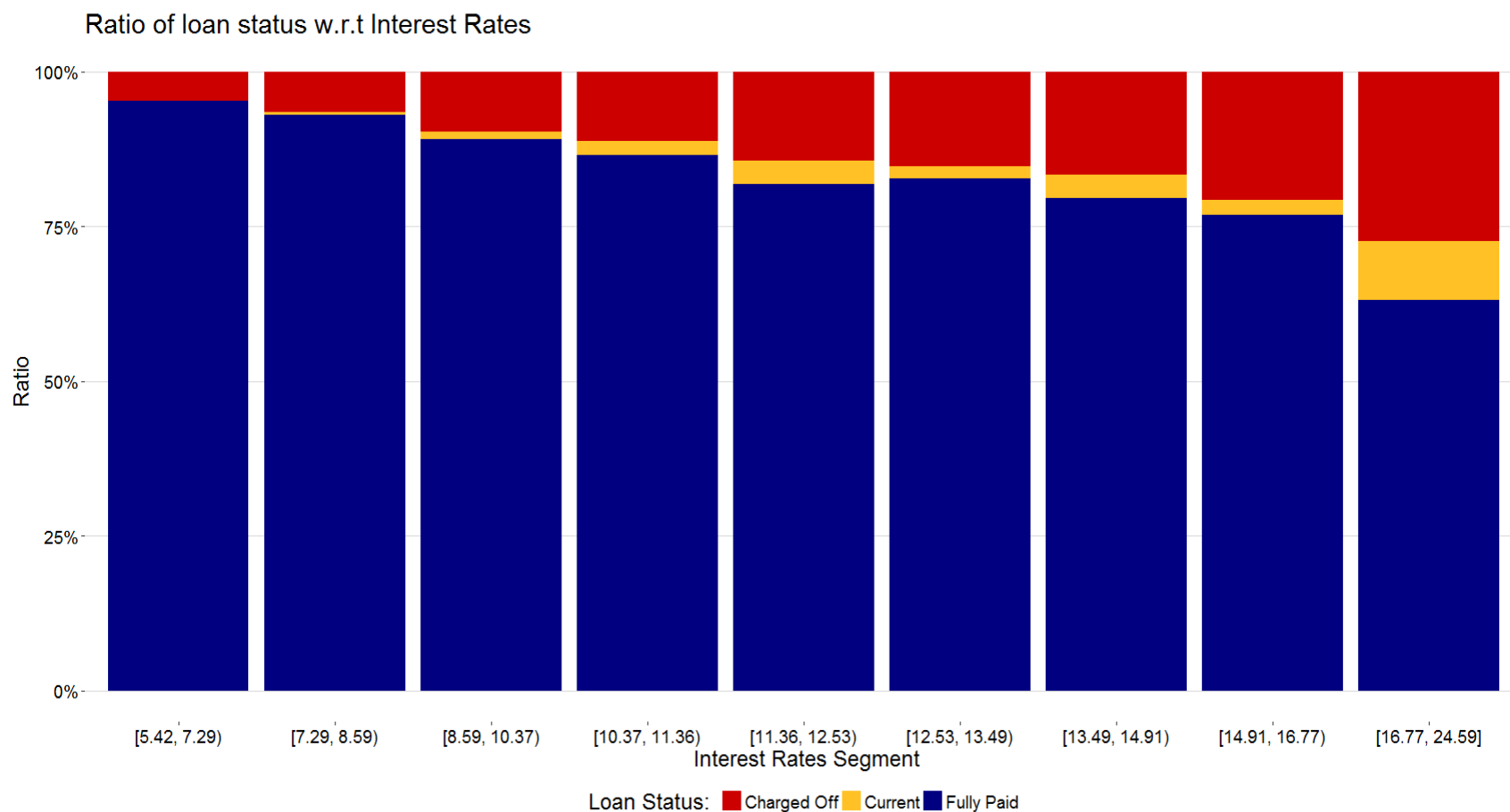
People with lower income group having high charged off rate.

# Grade With Most Defaulter



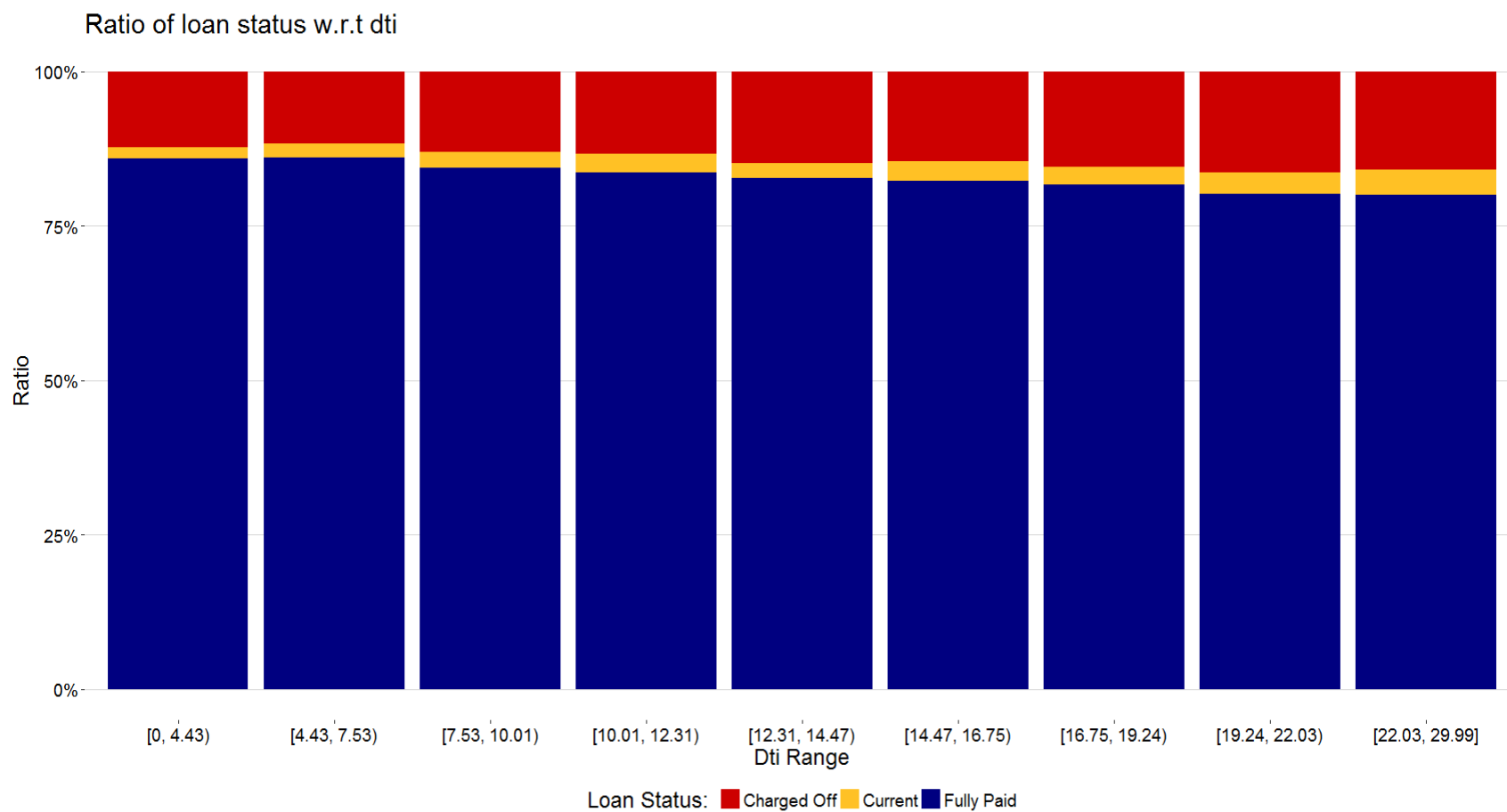
Higher the Grade of customer most likely to be charged off.

# Risky Interest Rate Bracket



Higher the interest rate(or interest rate bracket) more the chances that the customer will be charged off.

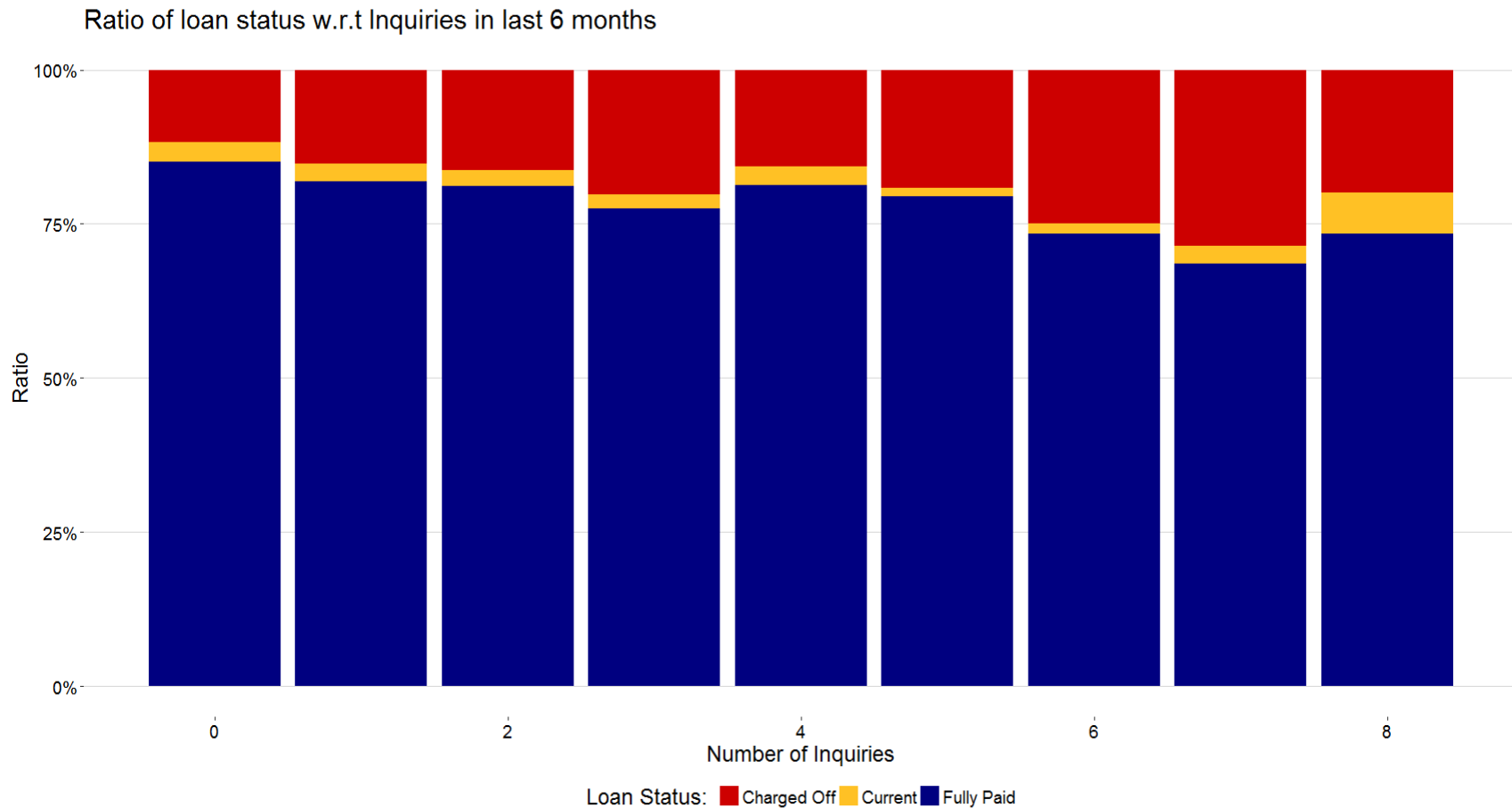
# Risky dti Range



Increase in dti having significant amount of chances for a customer to be defaulter.

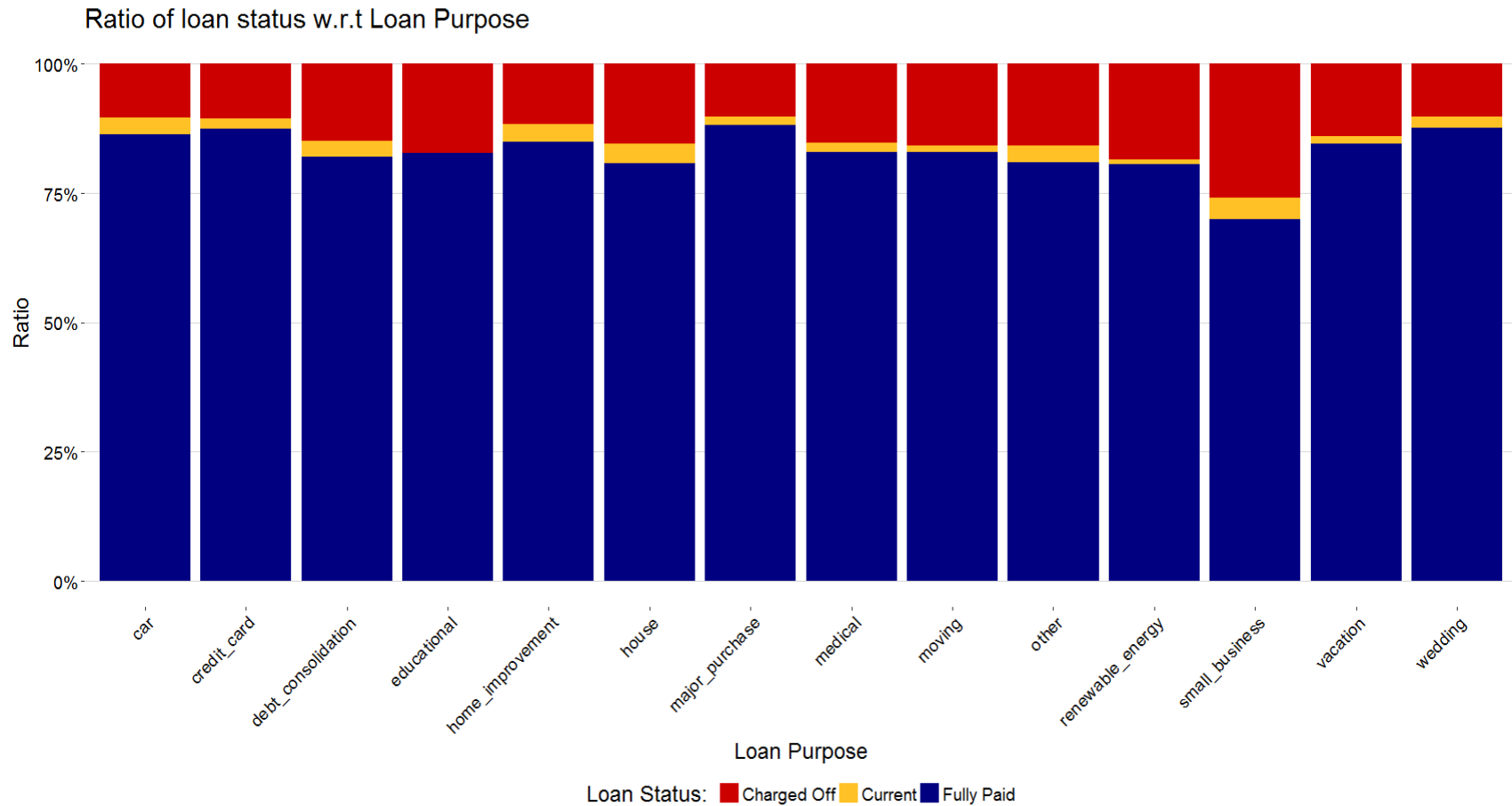


# More inquiries Affect Credit Score



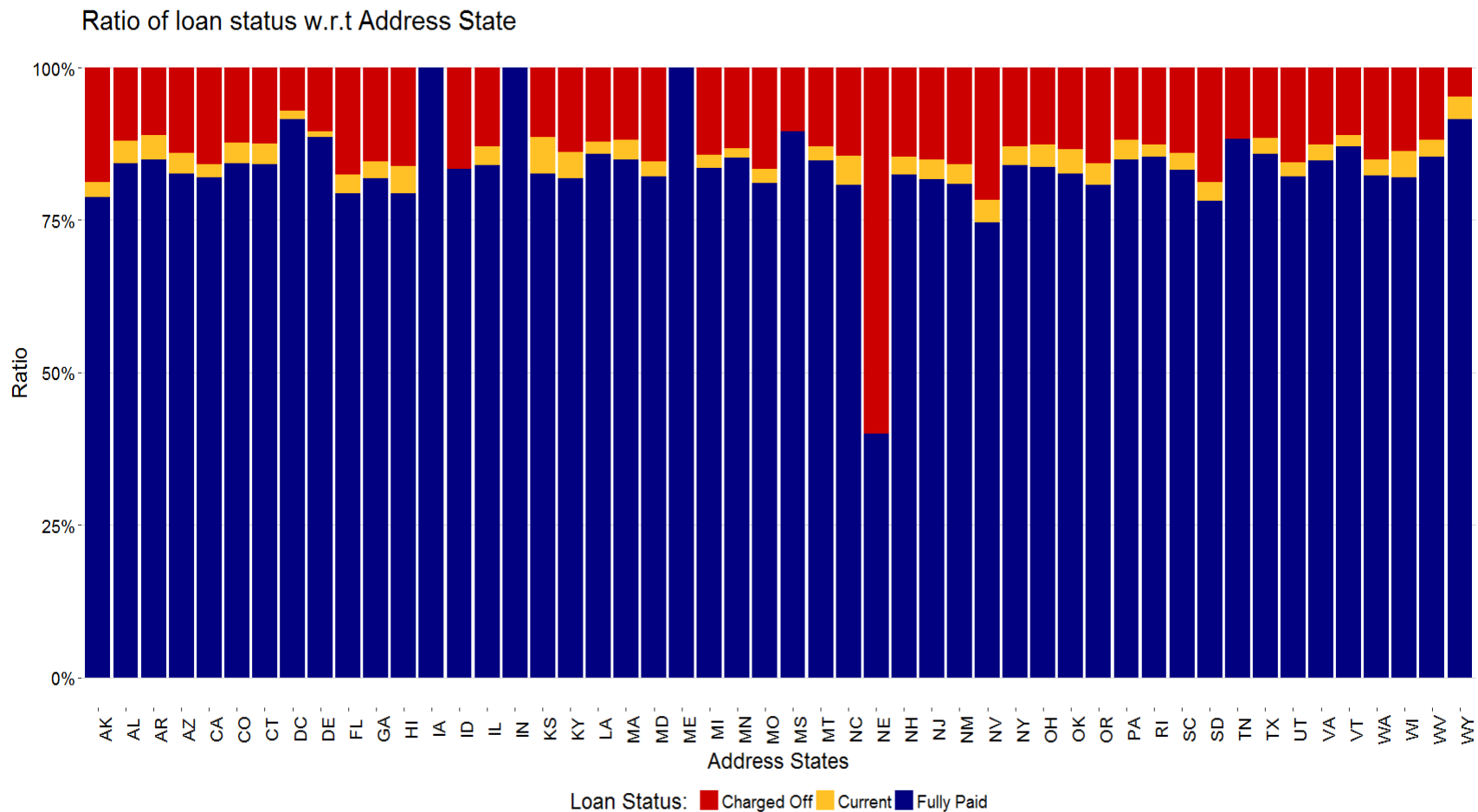
We have to taken in consideration the number of inquiries, more inquiries leads to low credit score hence more chances to be defaulter.

# Loan Purpose Trend



Person with Loan Purpose “Small Business” having high charged Off ratio, along with renewable energy and Education.

# State With Most Defaulter

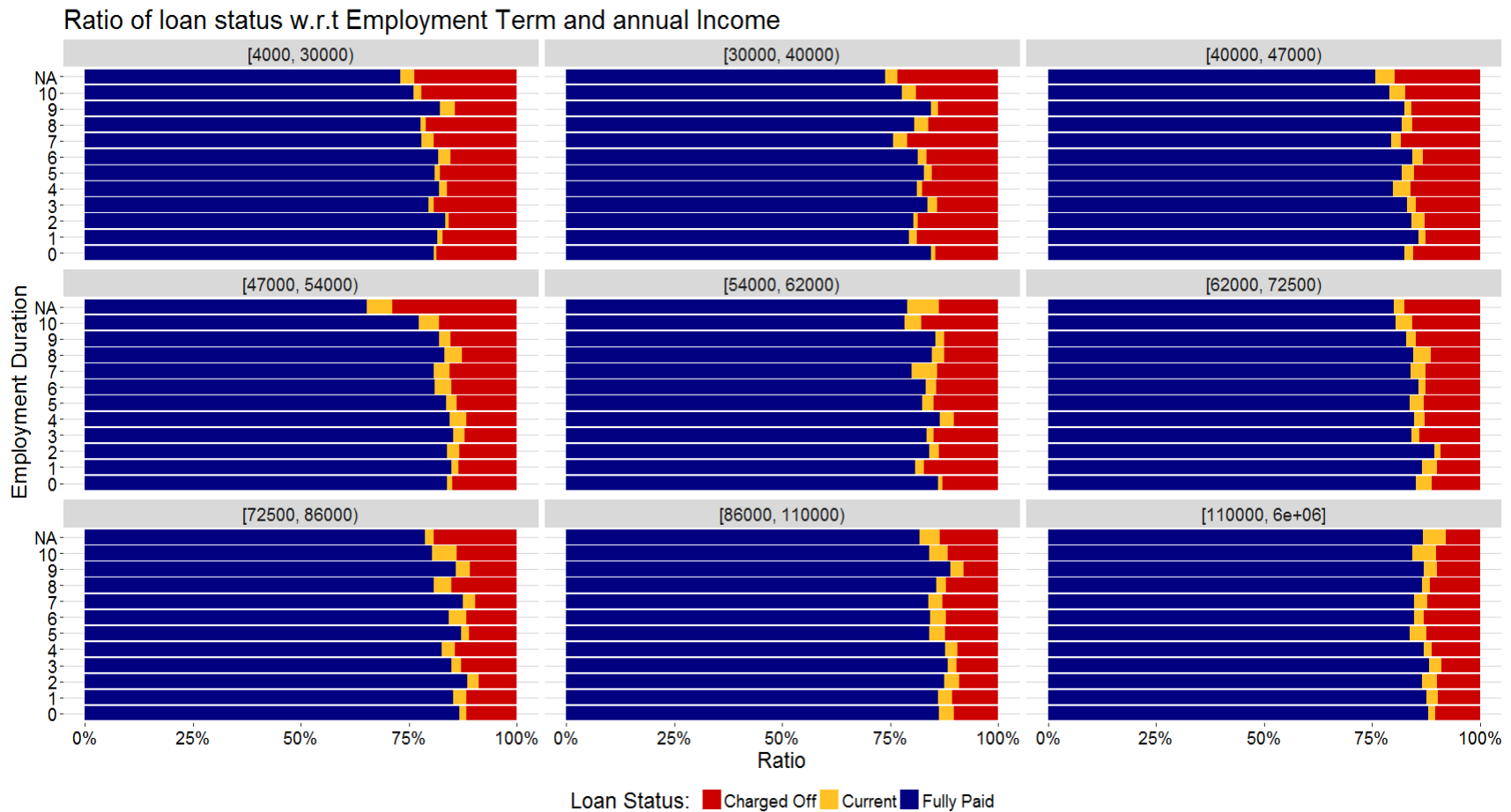


Customer from the state 'NE' having more chances to be defaulter..



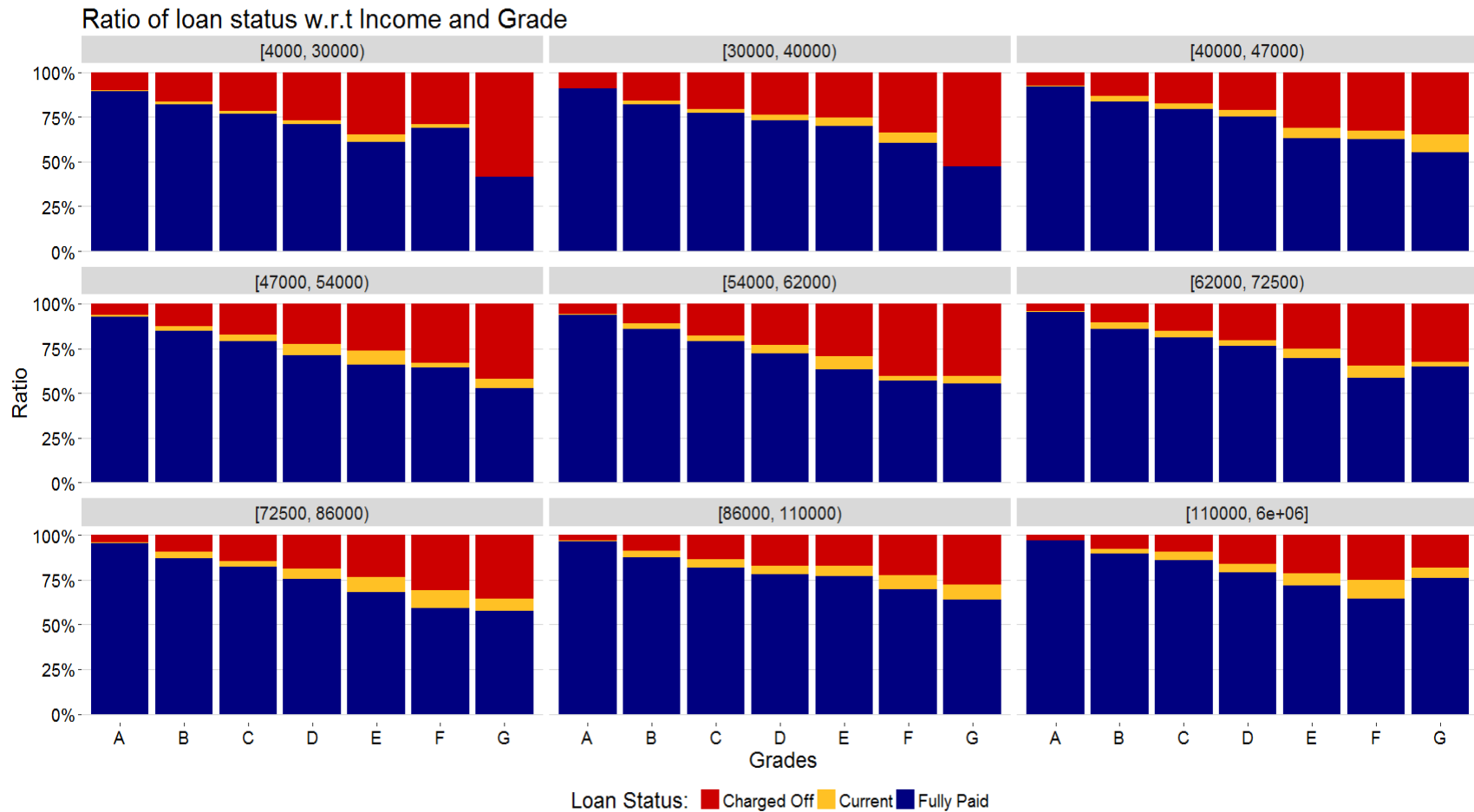
# BIVARIATE ANALYSIS

# Segmented Annual Income And Employment Term



People having home either Rented or Mortgage having higher chances to be defaulter.

# Segmented Annual Income And Grade Trend



Show among the Income group, customer with which Grade having more chance to be defaulter.



# Loan Purpose And Income Trend



Show among the Income group, customer with which Loan purpose having more chance to be defaulter.



 **LendingClub**