

# Lending Club Case Study

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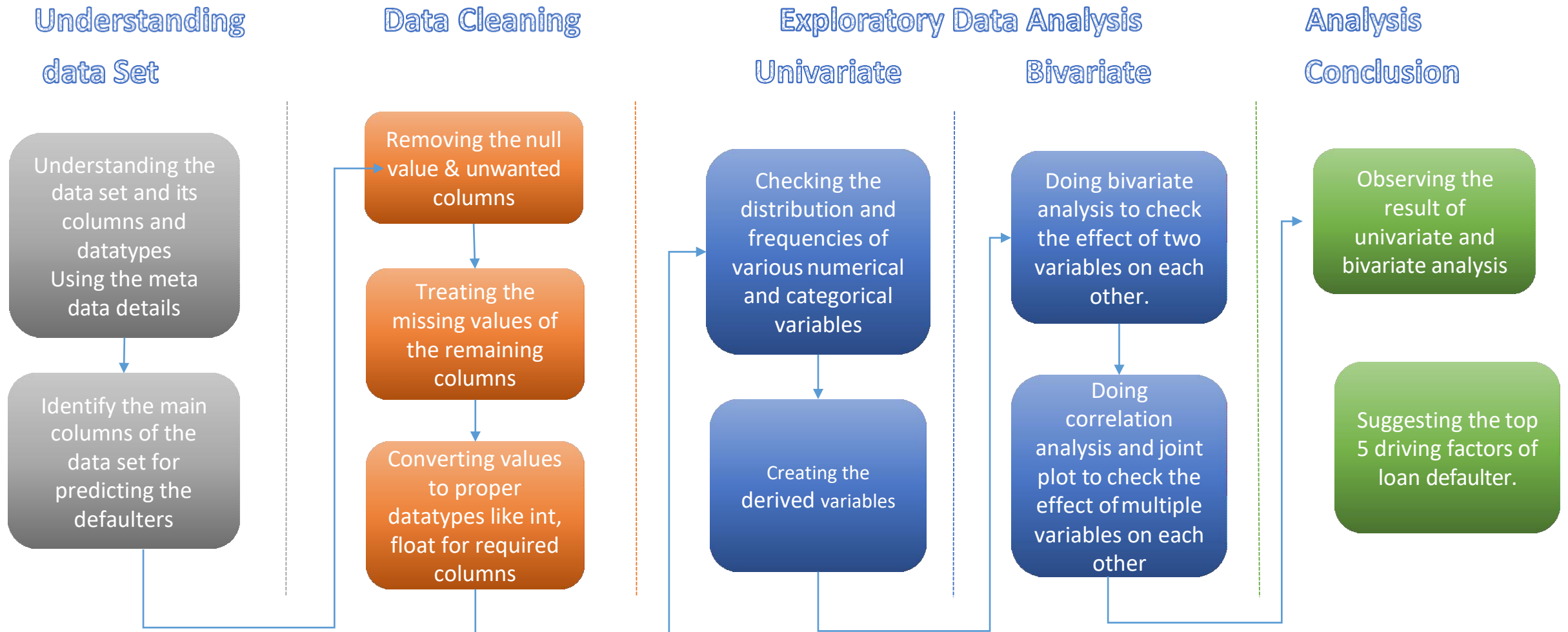
# Case Study Objective

Identifying risky loan applications mainly defaulters.

Understanding the driving factors or the derived variables which act as the main cause for loan defaulters.

Lending Club organization can make use of these driving factors to evaluate an loan applicant as a defaulter or non defaulter.

# Case Study Solution Approach



# Understanding Data Set

## Types of variables

- Loan Applicant demographic
- Loan related information & characteristics
- Loan Applicant behavior (if the loan is granted)

Applicant Demographic
Employee title
Employee length
Annual Income
Address State
Zip code
Description

Loan Information & Characteristics
Loan Status
Loan Amount
Funded Amount
Funder Amount from Investor
Interest Rate
Loan Grade
Loan Purpose

Applicant Behavior
Revolving Balance
Recoveries
Earlier Credit line
Delinquency Year -2

# Data Cleaning

- **Delete columns:** Delete unnecessary columns.
- **Remove outliers:** Remove high and low values that would disproportionately affect the results of your analysis.
- **Missing values:** Treat missing values with appropriate approach.
- **Duplicate data:** Remove identical rows, remove rows where some columns are identical.
- **Converting Datatypes:** Converting the values of the variables to proper data types like int, float etc for the required columns like employee length, term, interest rate etc.
- **Filter rows:** Filter by segment, filter by date period to get only the rows relevant to the analysis.

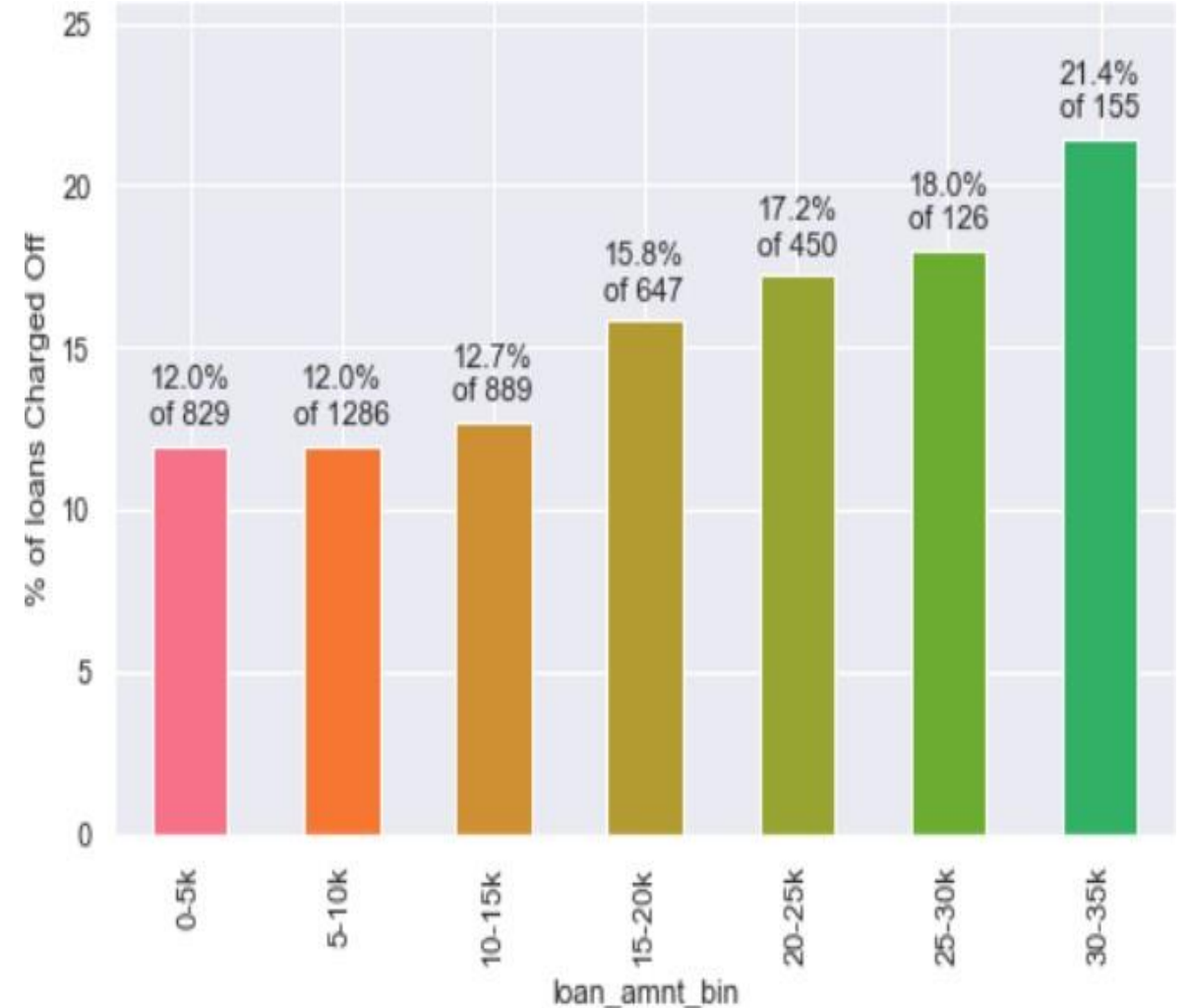
# Loan Amount Analysis

Performed univariate analysis on **loan amount** distribution from 5000 to 36000 to see the Percentage of loan charged off.

## Observation:

The loans amount ranges between 30 -35k is mostly charged off (around 21.4%).

Higher the loan amount leads to Higher the possibility of charge off.

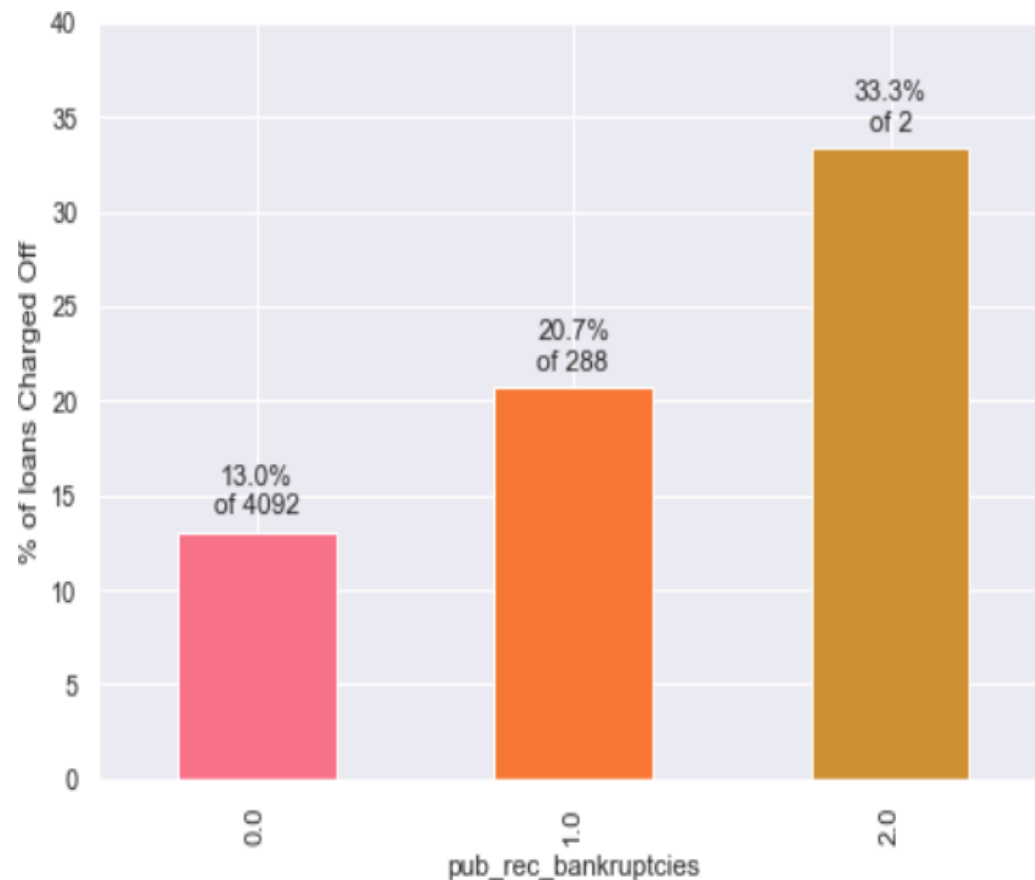


# public record bankruptcies Analysis

Performed univariate analysis on **public bankruptcies record** of the application.

## Observation:

- Applicants with public bankruptcies record of 2 has higher percentage of charged off (around 33.3%)
- Higher the public bankruptcies record leads to Higher the possibility of loan charged off.

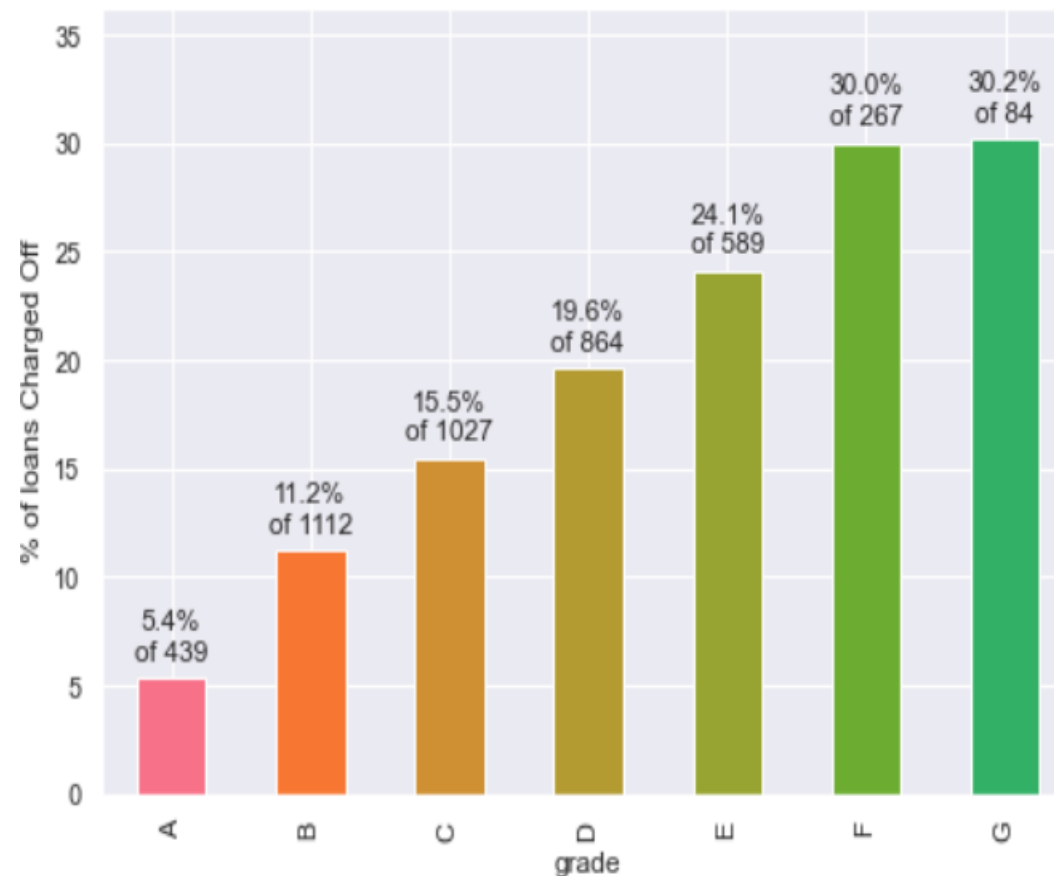


# Loan GRADE Analysis

Performed univariate analysis on the **grade** of the loan.

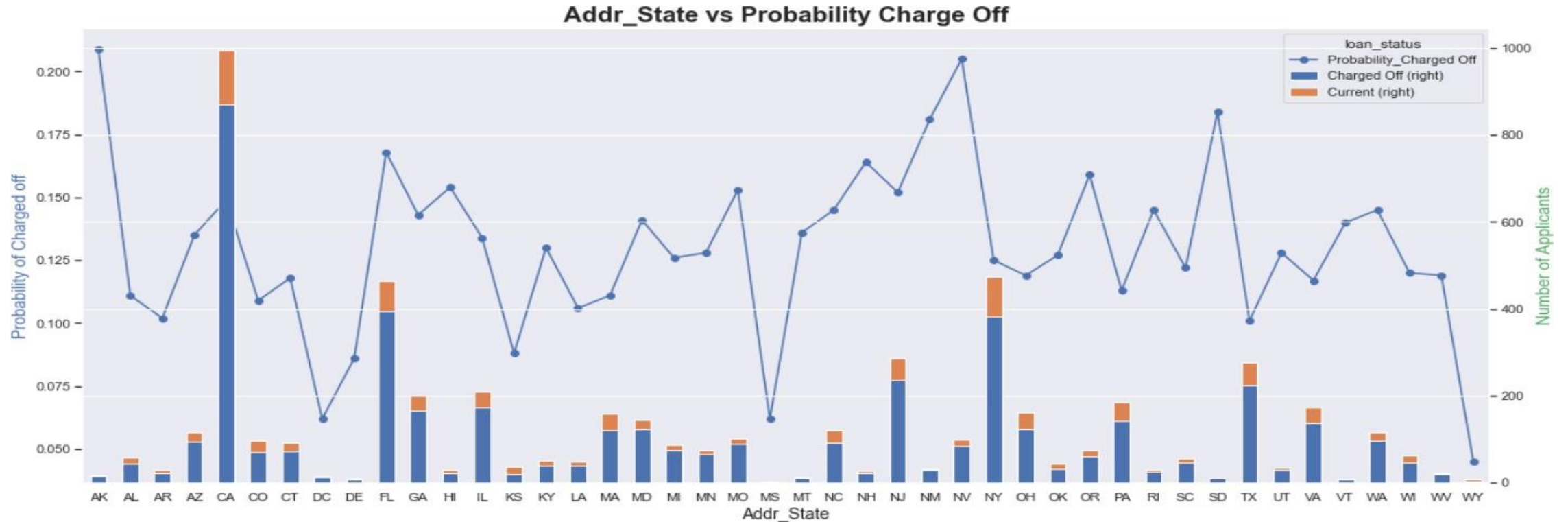
## Observation:

- The loan grade of F & G has higher Charge off percentage (around 30.0 to 30.2%)
- Loan grades of F & G has higher risk of getting charged off.



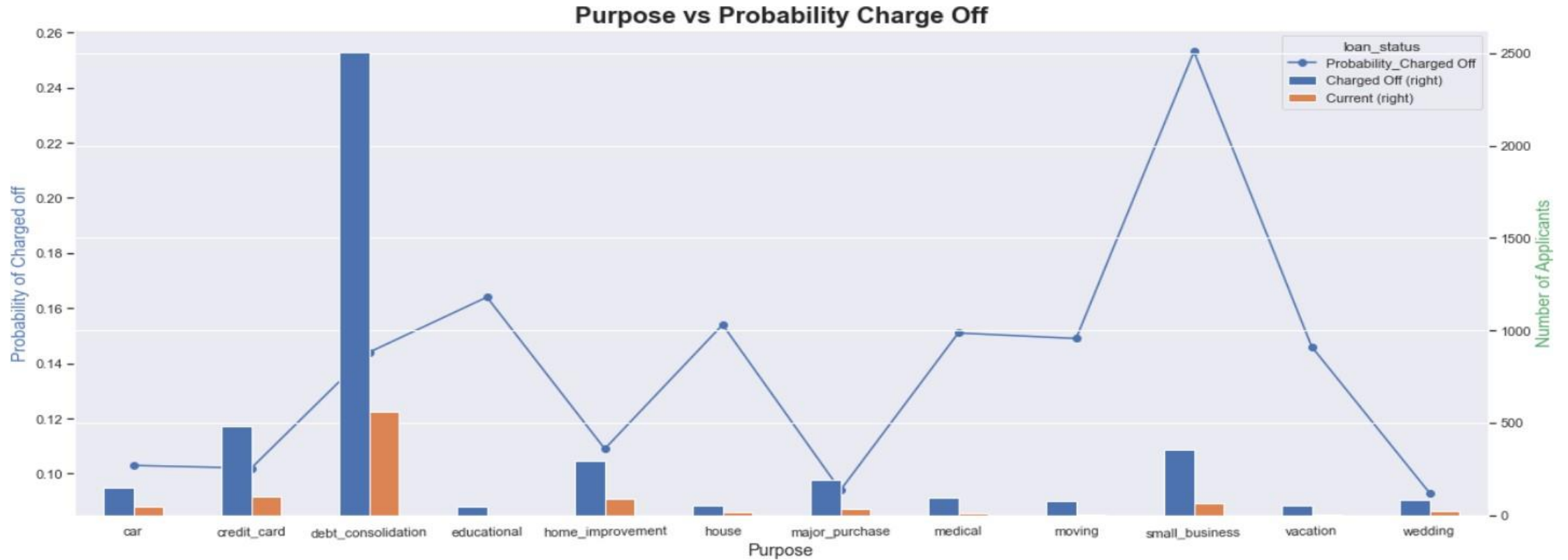


# Address State Vs Charge Off Analysis



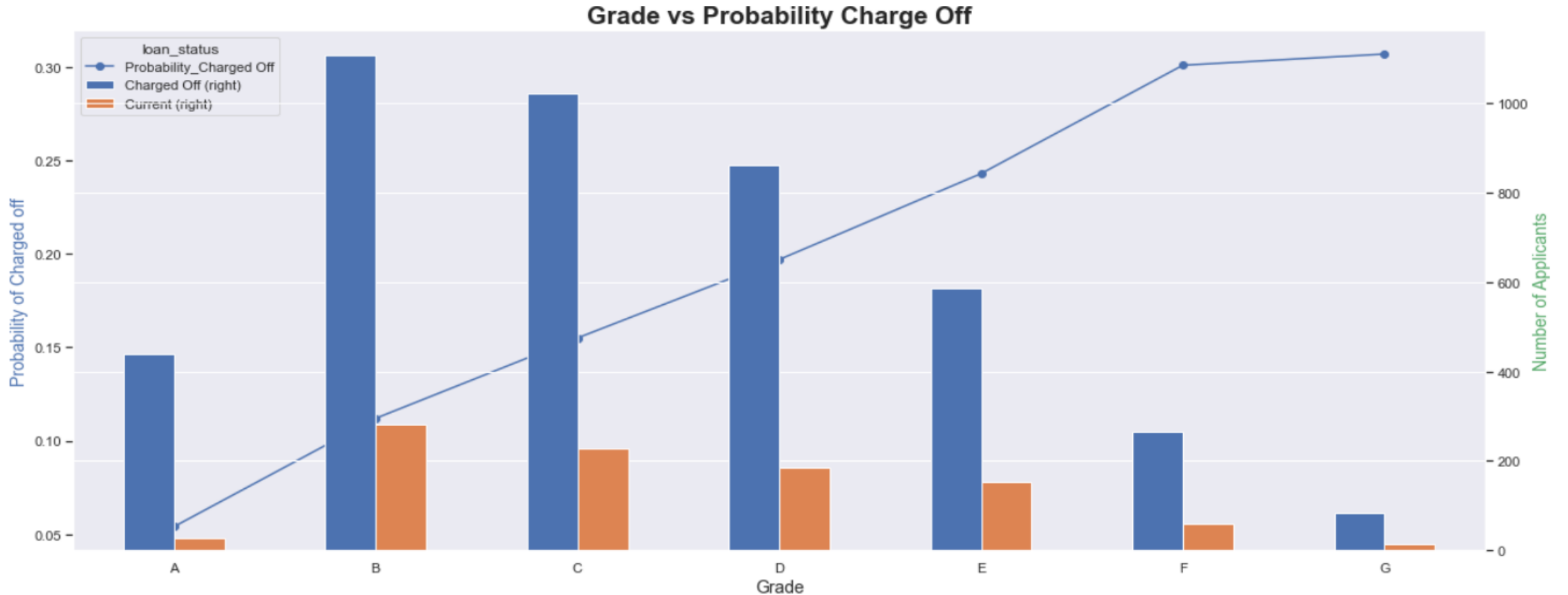
**Observation:** State NV has a high probability of charge off 20% than any other state.

# Loan Purpose Vs Charge Off Analysis



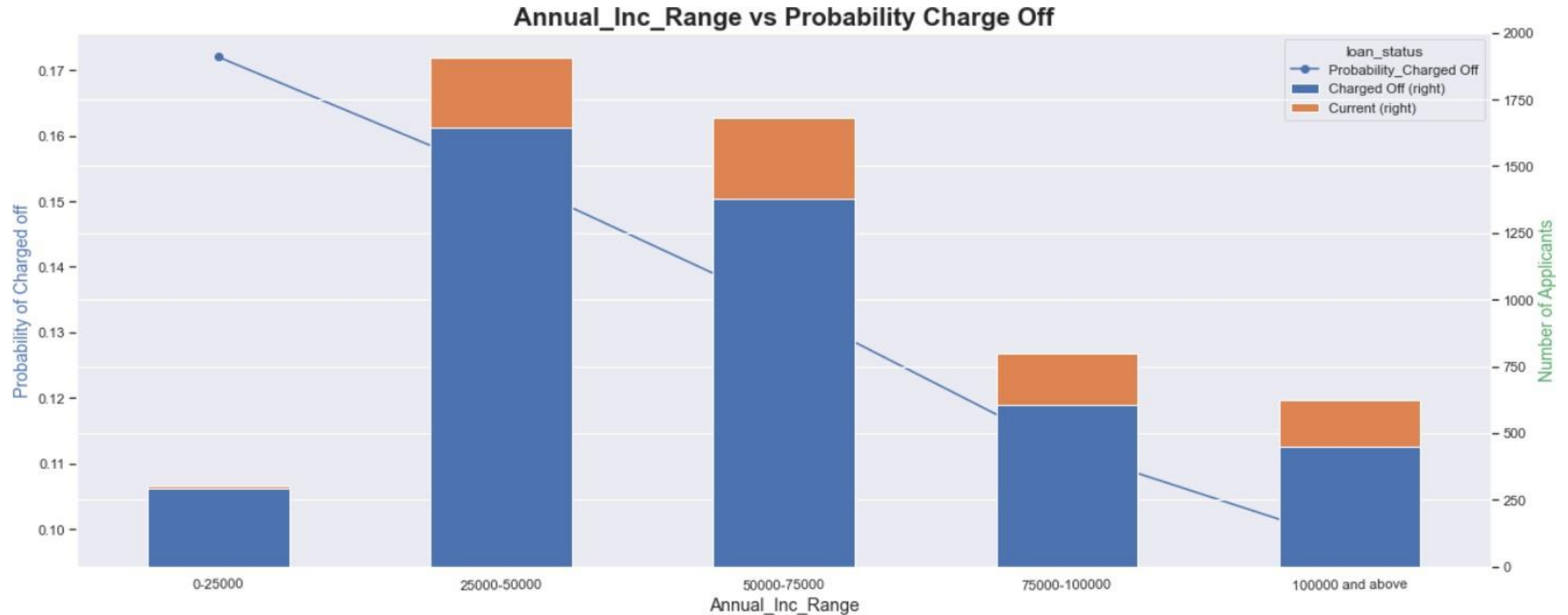
**Observation:** Applicants who has taken loan for **small business** has highest probability charged off of 25.3%.

# Loan Grade Vs Charge Off Analysis



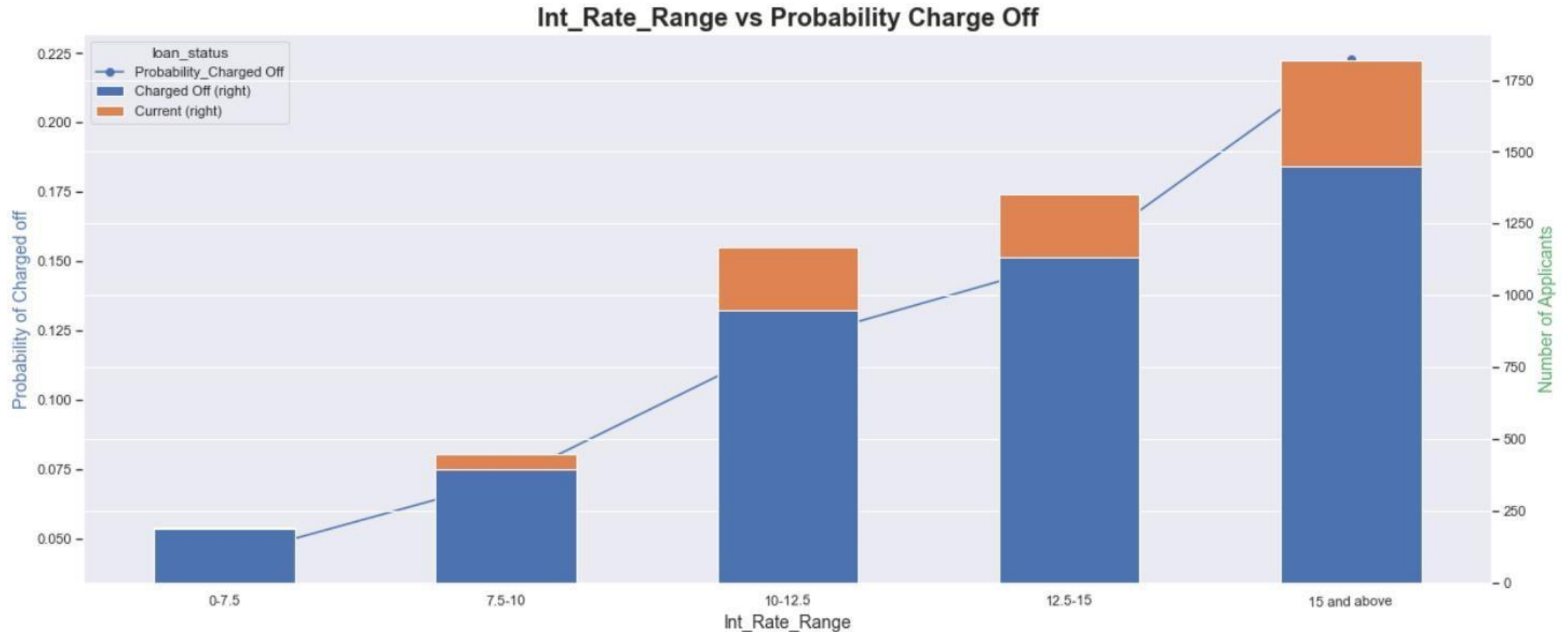
**Observation:** G & F grade has high probability of charged off and the charge off is increasing from A to G grade.

# Annual Income vs Charged off Analysis



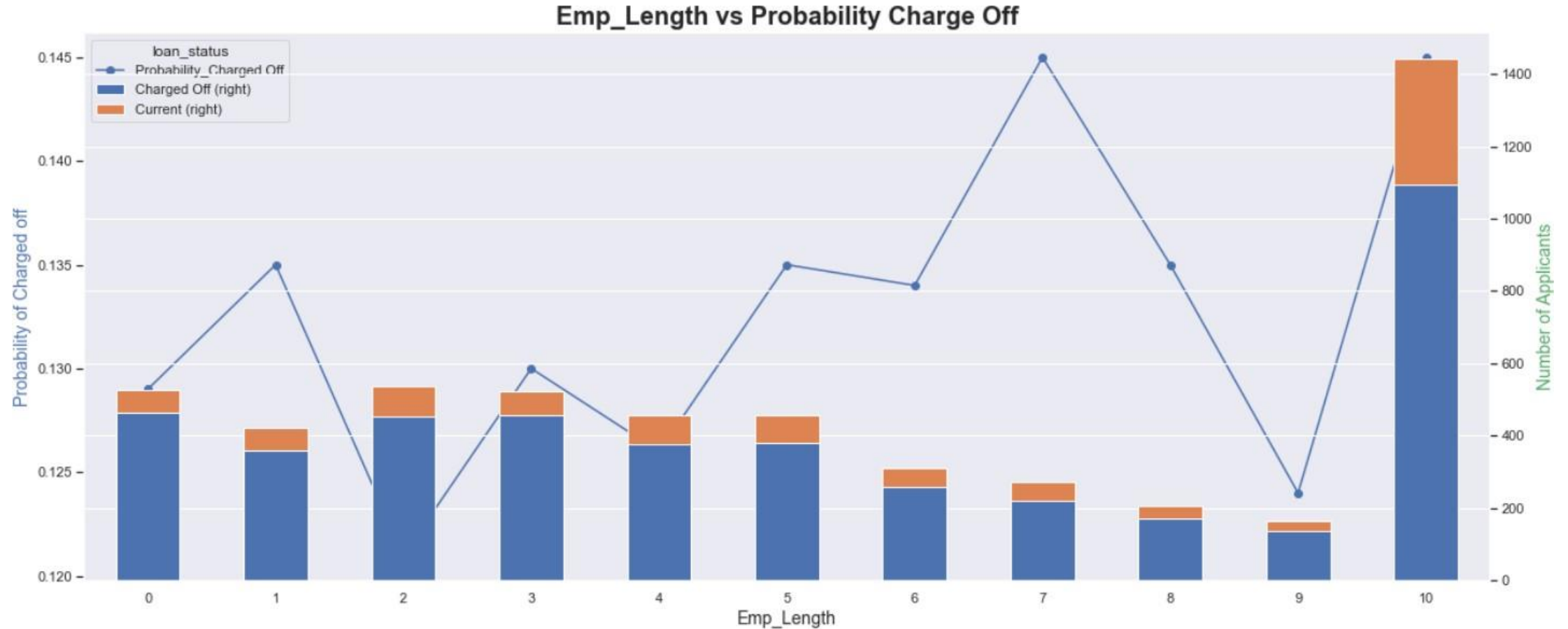
**Observation :** Income is inversely correlated to default, higher the income, less the default and vice versa. Lower income group has high probability of charged off.

# Interest Rate vs Charged Off Analysis



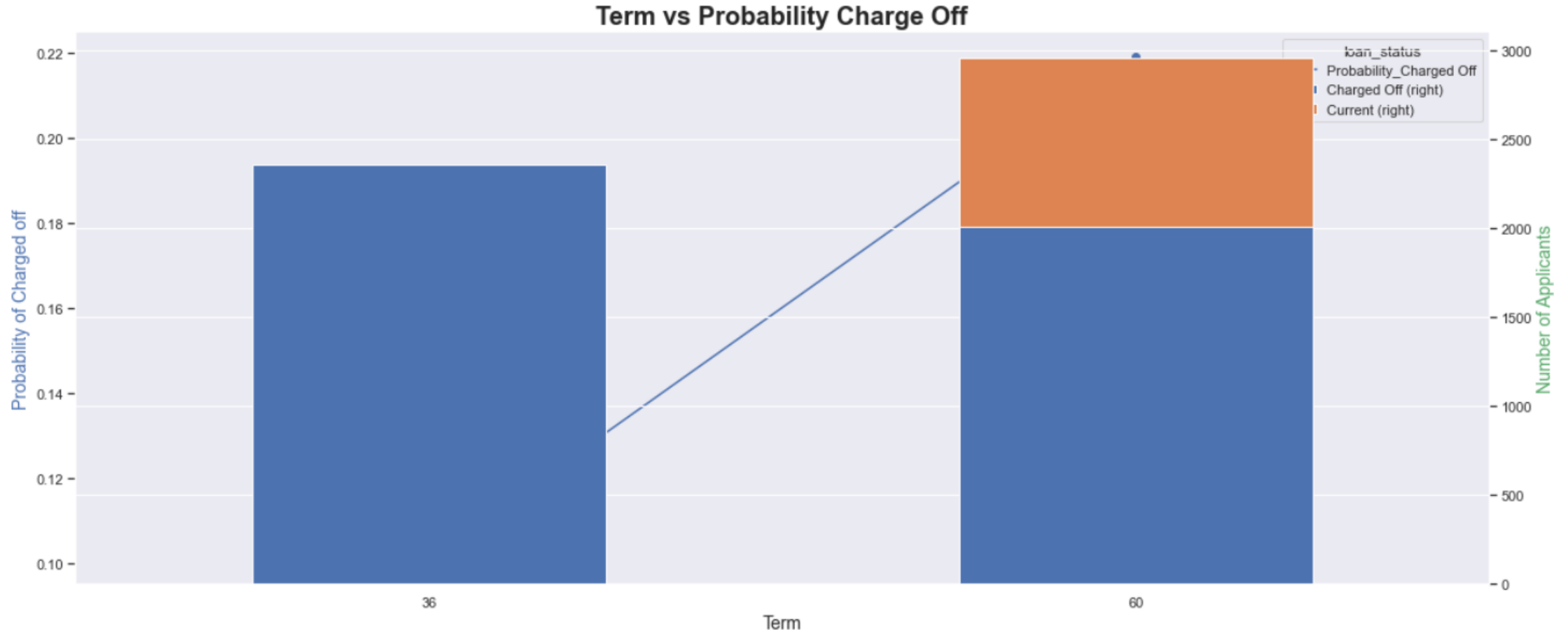
**Observation:** As the interest rate increases the probability of default is increasing, highest probability of charge off at 15% and above.

# Employee Length vs Charged Off Analysis



**Observation:** Applicants who have 7 years and 10 years of experience are having high probability of charge off.

# Loan Term vs Charged Off Analysis



**Observation:** Higher the loan term, Higher the probability of charge off.

# Recommendation

Below are the top five recommendations for factors which influence the defaulter which is observed from the exploratory data analysis performed on the loan data set.

Please do avoid lending loans based on the below factors :-

1. Loan grade G & F which has higher charge off rate of 30%.
2. Small business loan purpose which has the second higher charge off (25.3%)
3. Higher interest rates loan leads to higher charge off (22.3%)
4. Longer the loan terms leads to higher charge off (21.9%)
5. Lower the annual income of applicant leads to higher possibility of charge off (17.2%)

