

Gramener Case Study : The Lending Club

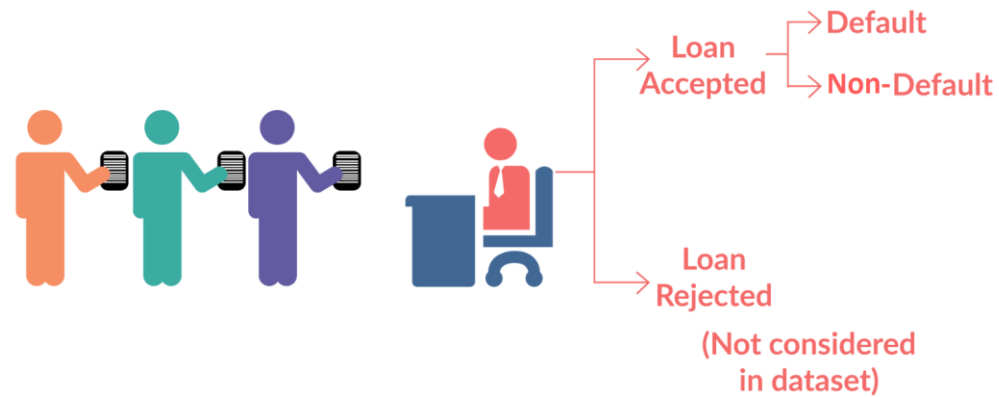


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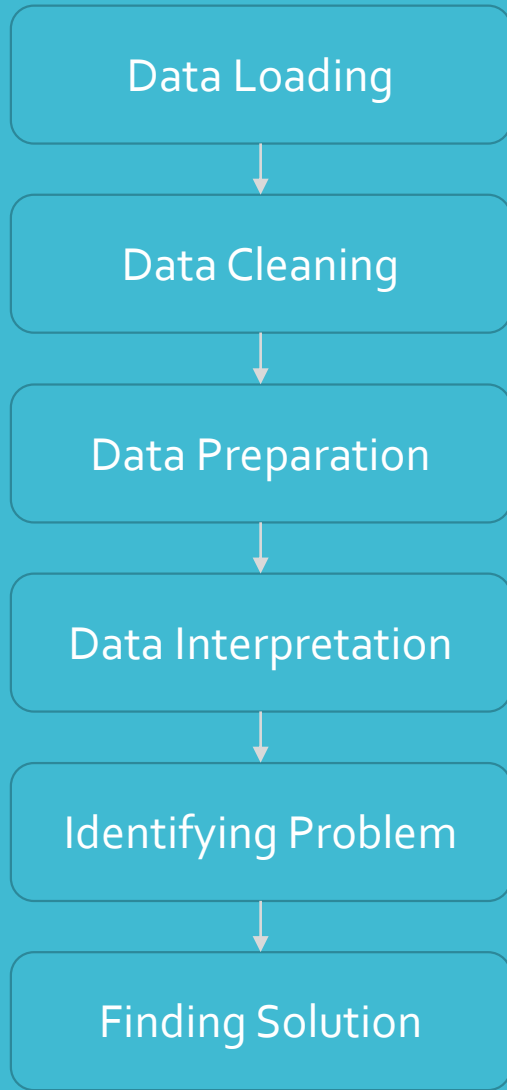
Business Objective

- The company is the largest online loan marketplace, facilitating personal loans, business loans, and financing of medical procedures.
- The aim is to identify patterns which indicate if a person is likely to default.
- This company wants to understand the driving factors (or driver variables) behind loan default, i.e. the variables which are strong indicators of default. The company can utilise this knowledge for its portfolio and risk assessment.

LOAN DATASET

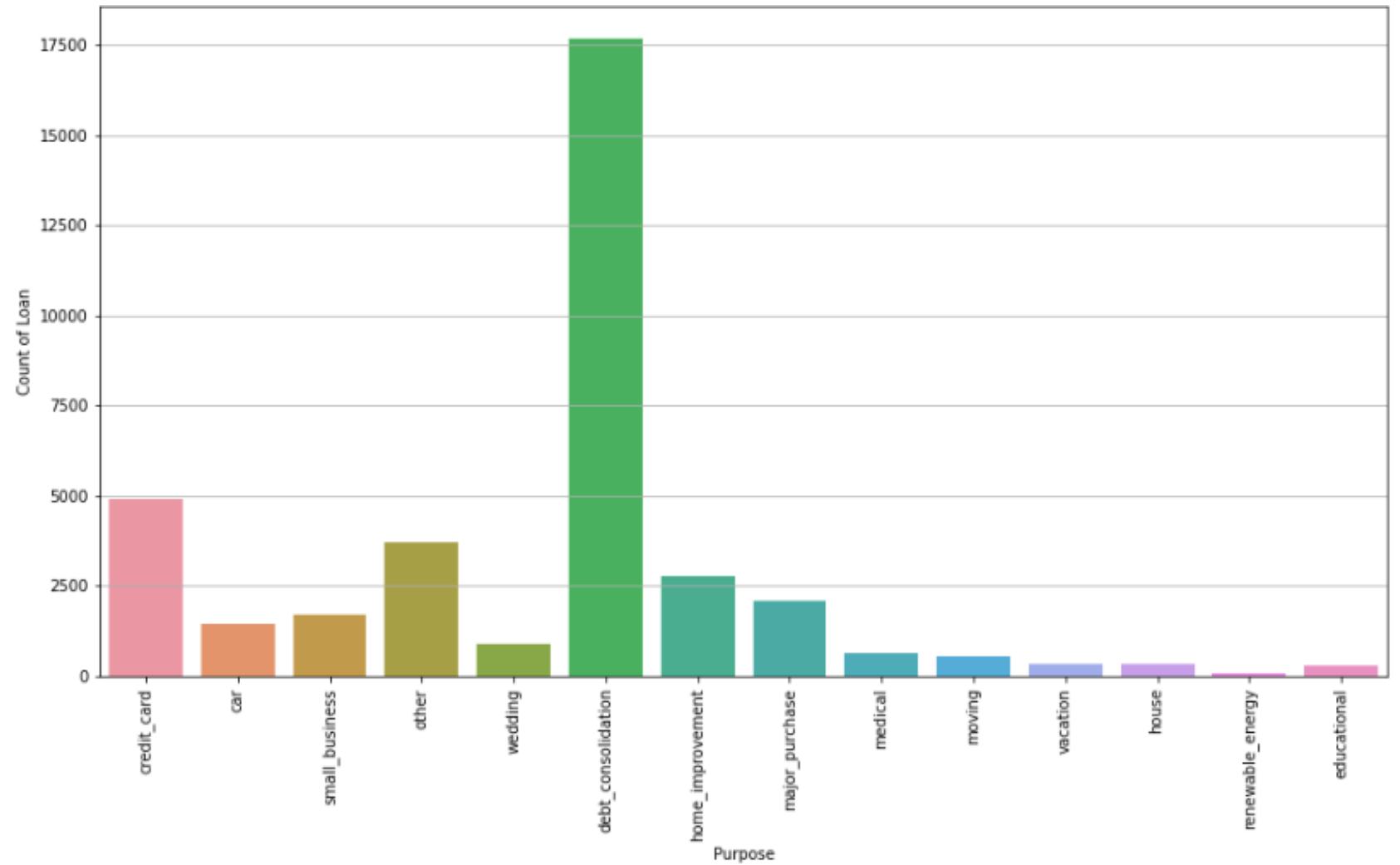


Methodologies



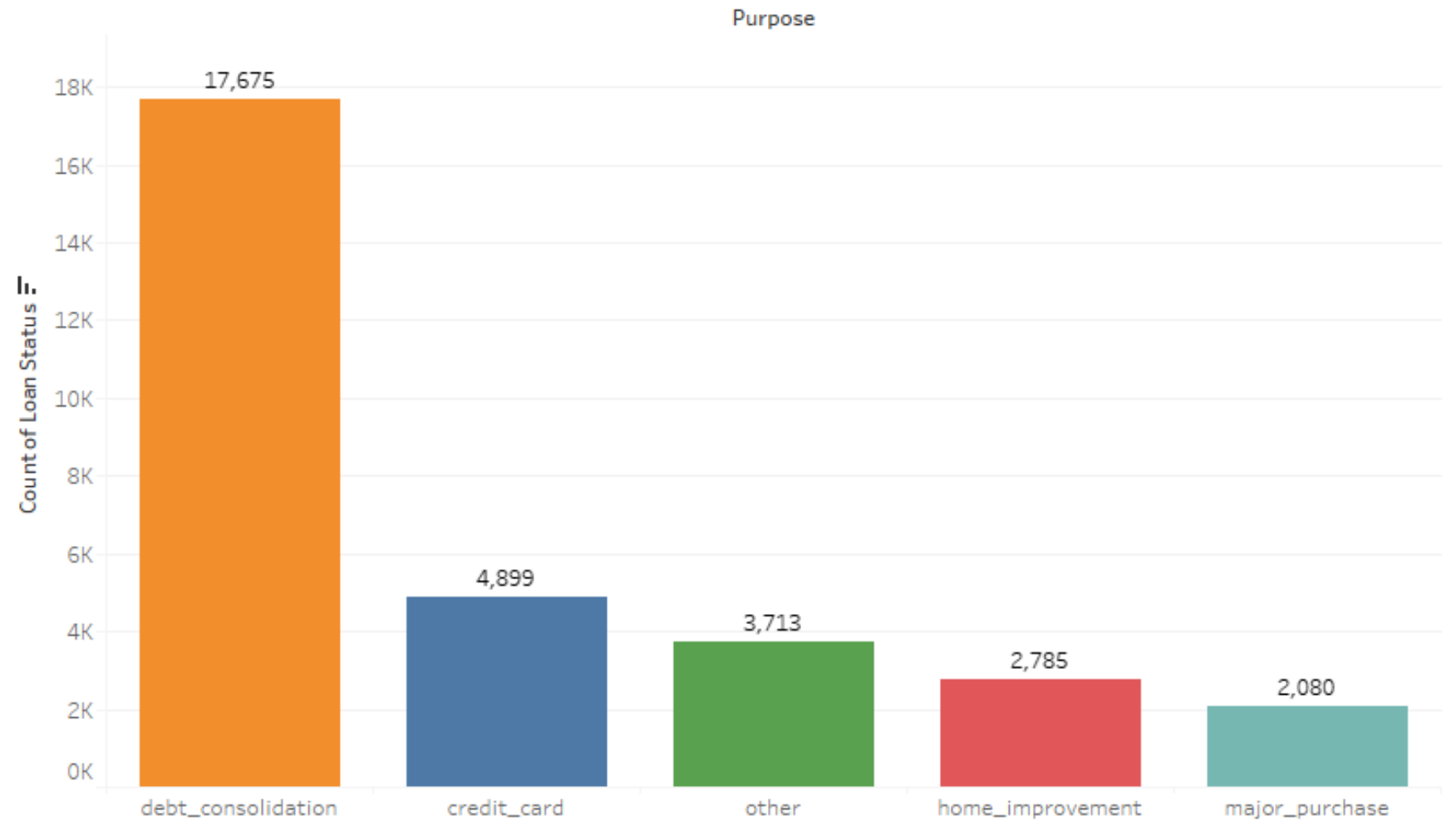
- Load the dataset to I-python notebook
- Data cleaning to avoid the impact of unstructured data on final results
- Change the data types of columns to correct format.
- Derive new variables required for data analysis
- Identify the problem using plots visualization on different attributes
- Recommend ways to solve the problem

Let's look at
some purposes
for taking Loan



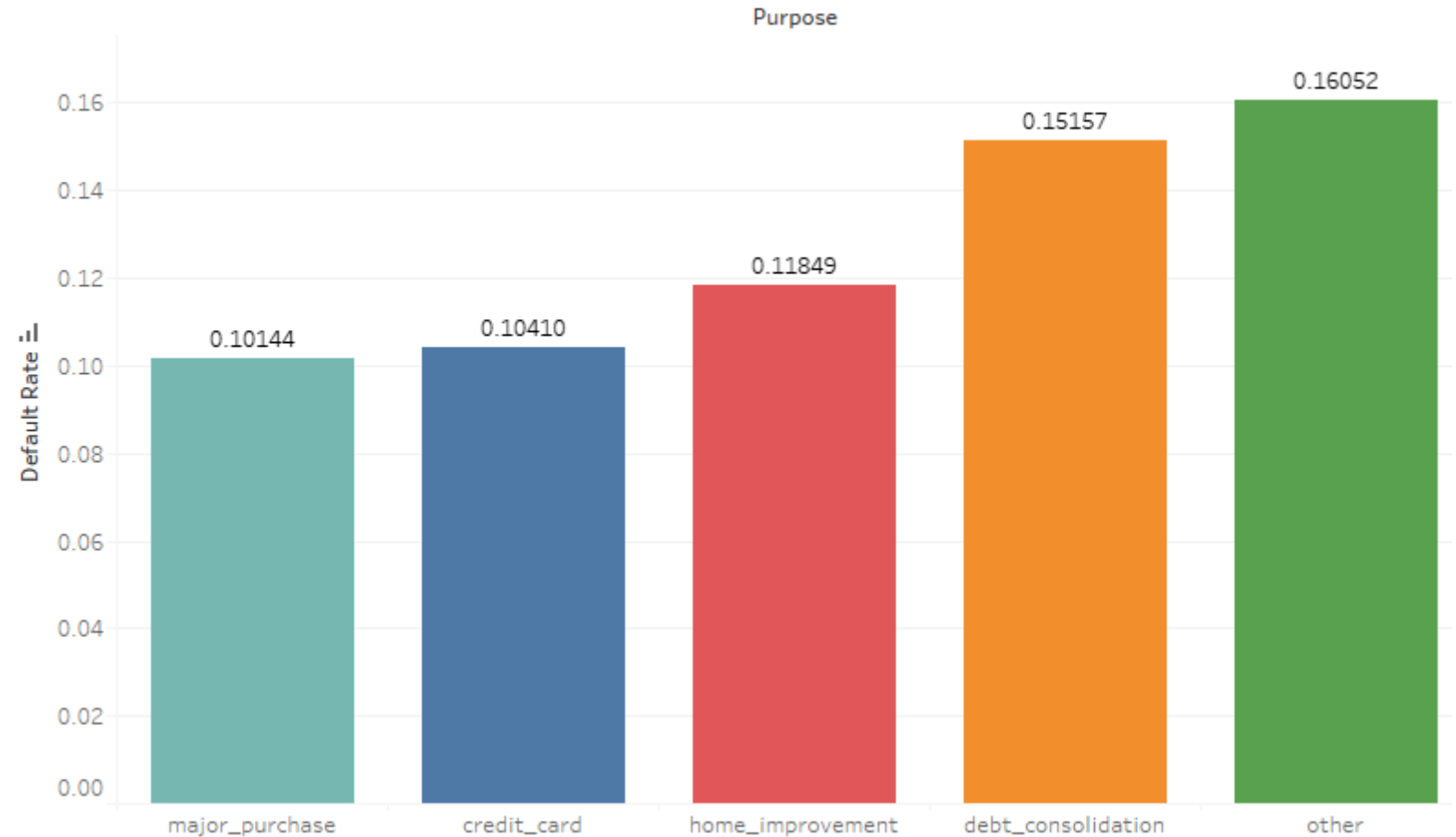
Top 5 Purposes of Taking Loan

1. Debt Consolation
2. Credit Card
3. Other
4. Home Improvement
5. Major Purchase



Default Rate Across Purpose

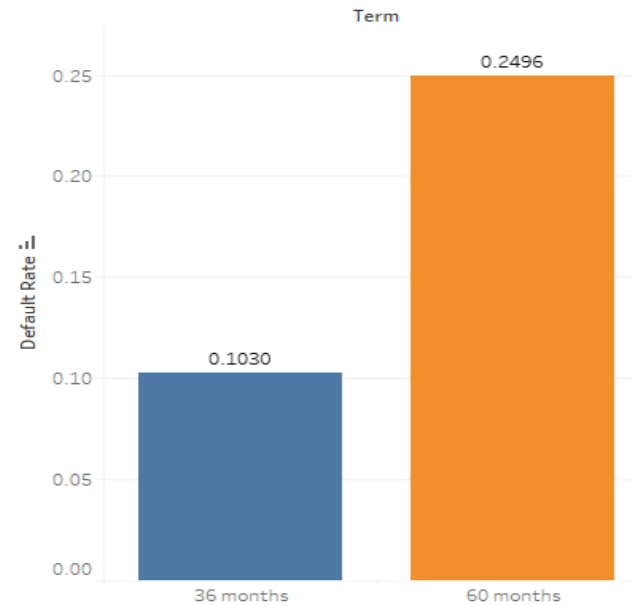
Purpose	Default Rate(%)
Major Purchase	10
Credit Card	10
Home Improvement	12
Debt Consolation	15
Other	16
Difference (max – min)	6



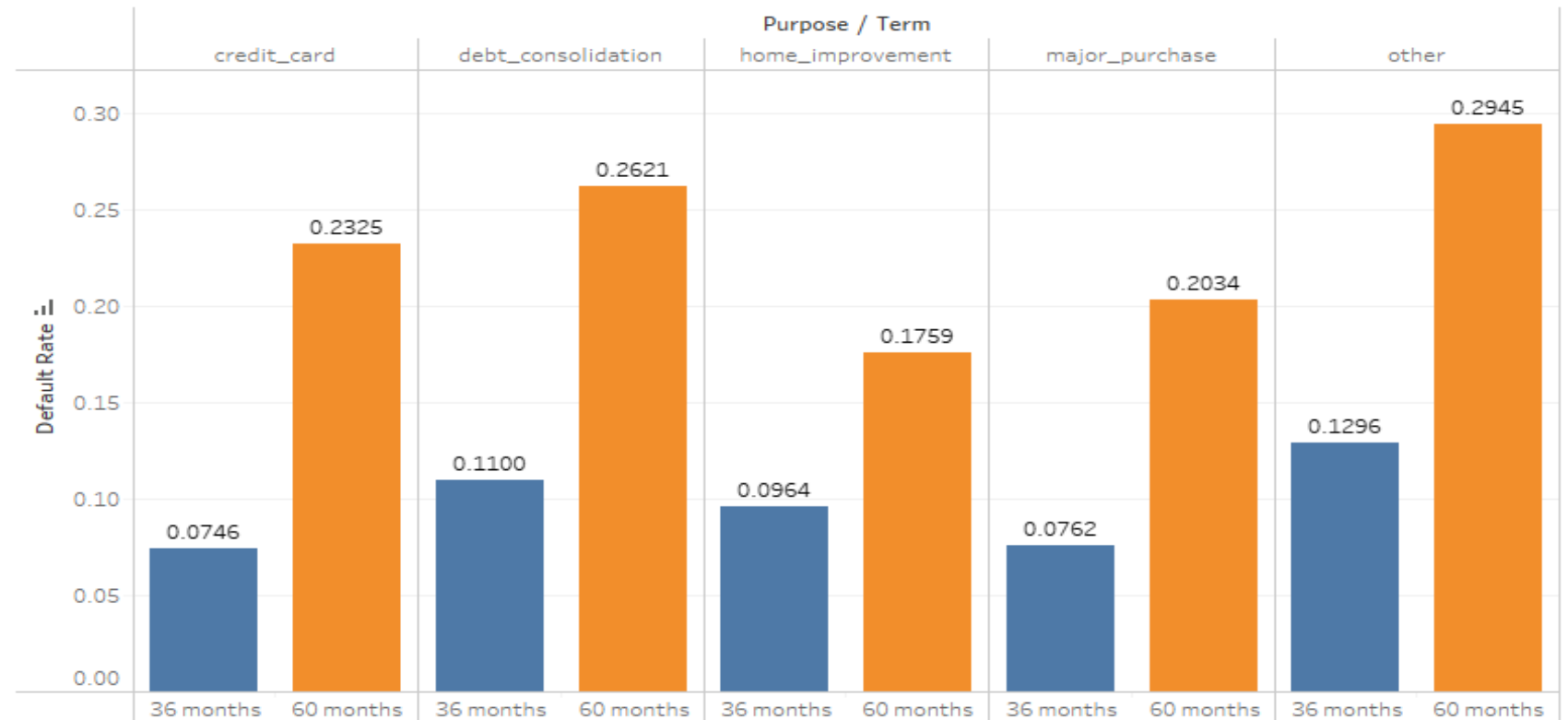
People who takes loan for purpose like other and debt consolation are more likely to default. So, giving more loans to such people is a loss to the company.

Default Rate Across Term and Purpose

Term	Default Rate(%)
36 Months	10
60 Months	25
Difference (max - min)	15

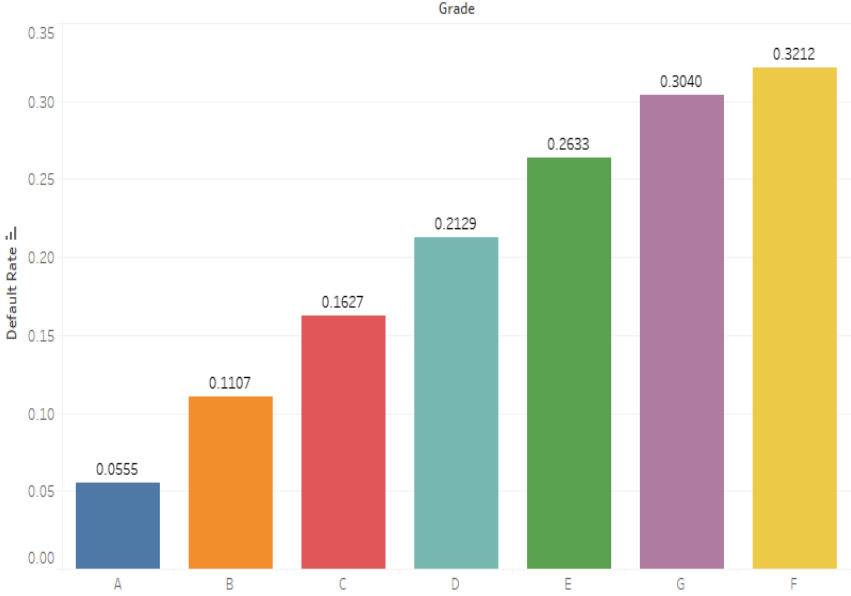


We can see that people defaults more when they required to repay the loan for longer duration the trend is same for every purpose. People with shorter loan duration have better payment record.

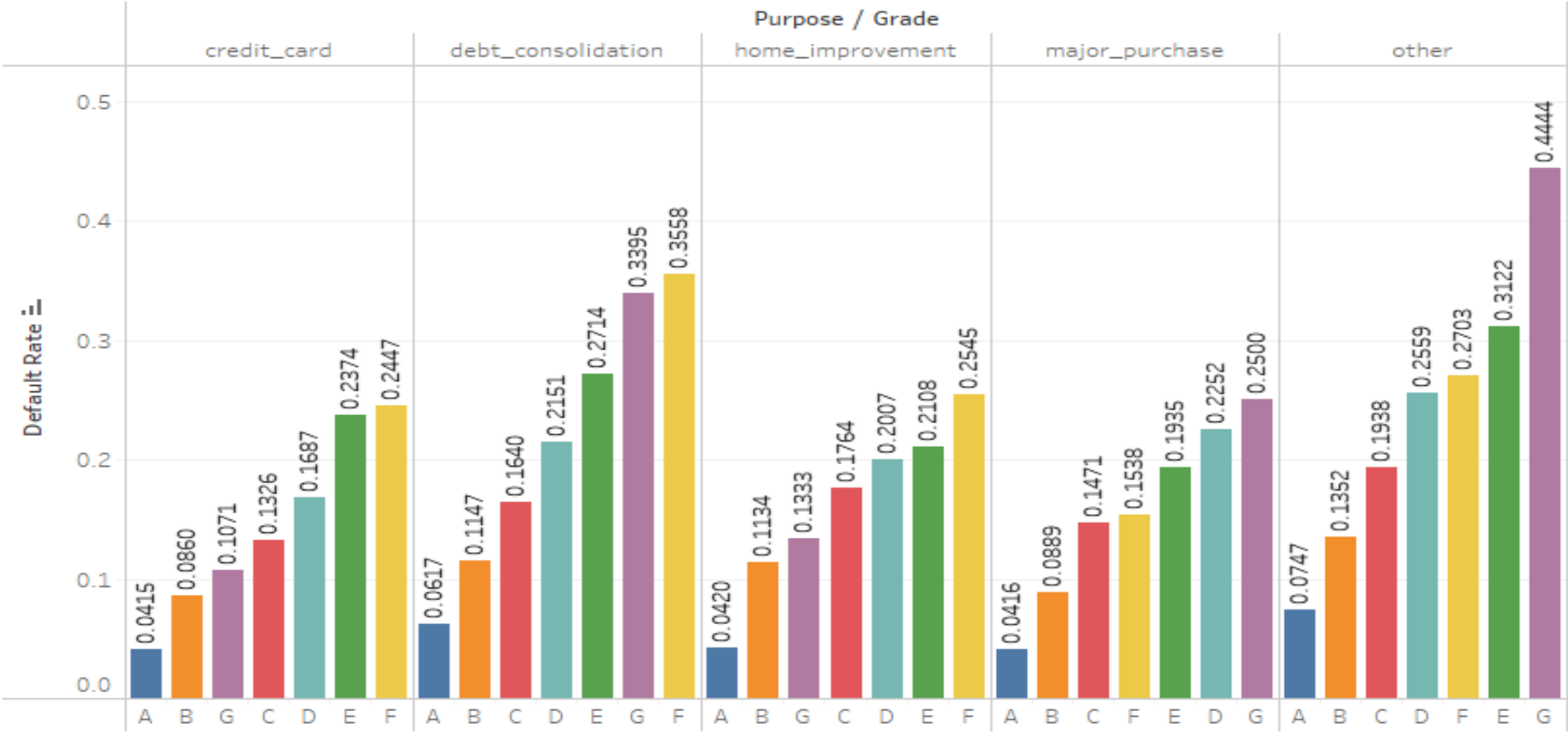


Default Rate Across Grade and Purpose

Grade	Default Rate(%)
A	6
B	11
C	16
D	21
E	26
G	30
F	32
Difference (max – min)	26

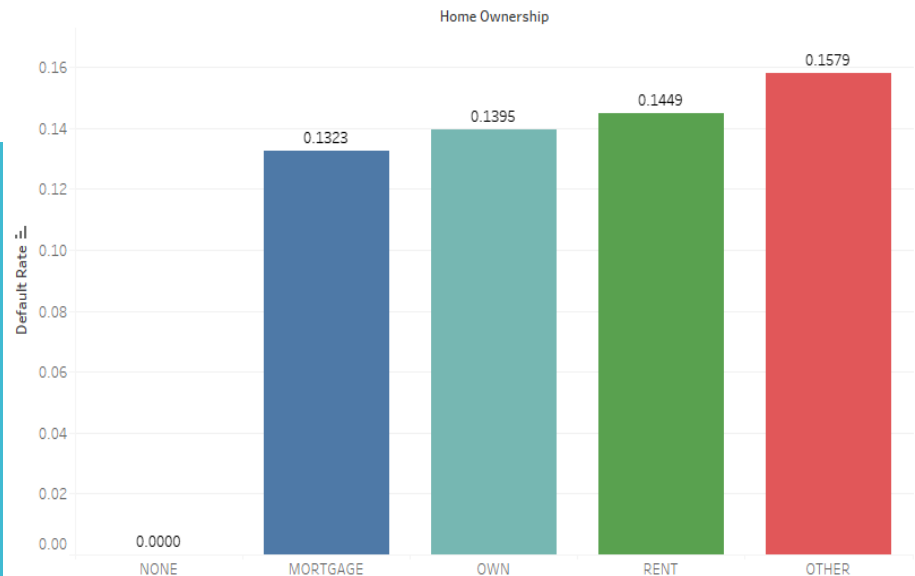


People in group 'F', 'G' and 'E' are more likely to default than other people in other groups. And the trend is very similar within the purposes. Giving loans to people in these groups is a loss as the default rate is high.

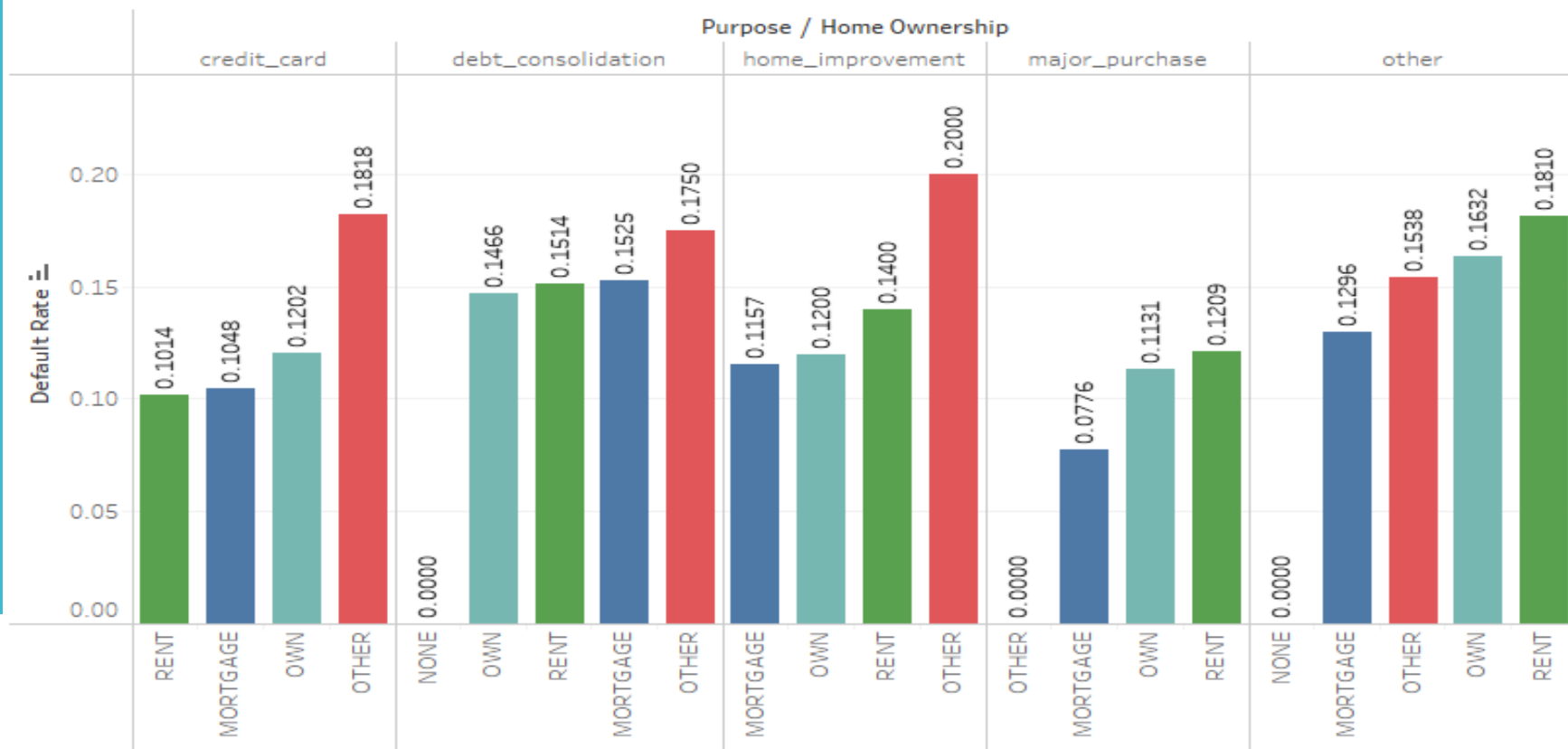


Default Rate across Home Ownership and Purpose

Home Ownership	Default Rate(%)
Mortgage	13
Own	14
Rent	14
Other	16
Difference (max – min)	3

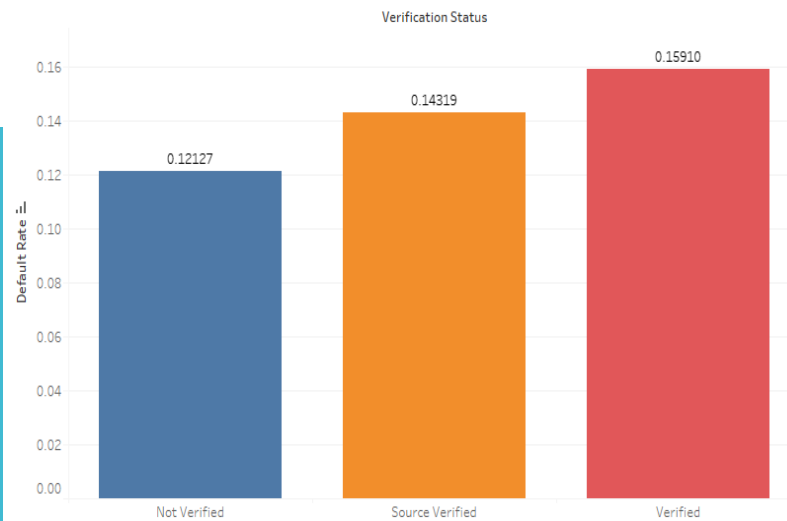


People who have other home ownership are more likely to default loan. Trend is similar for purpose like Credit Card, Debt Consolation and Home Improvement. But for Major Purchase and Other loan purpose, people who live on rent defaults more.

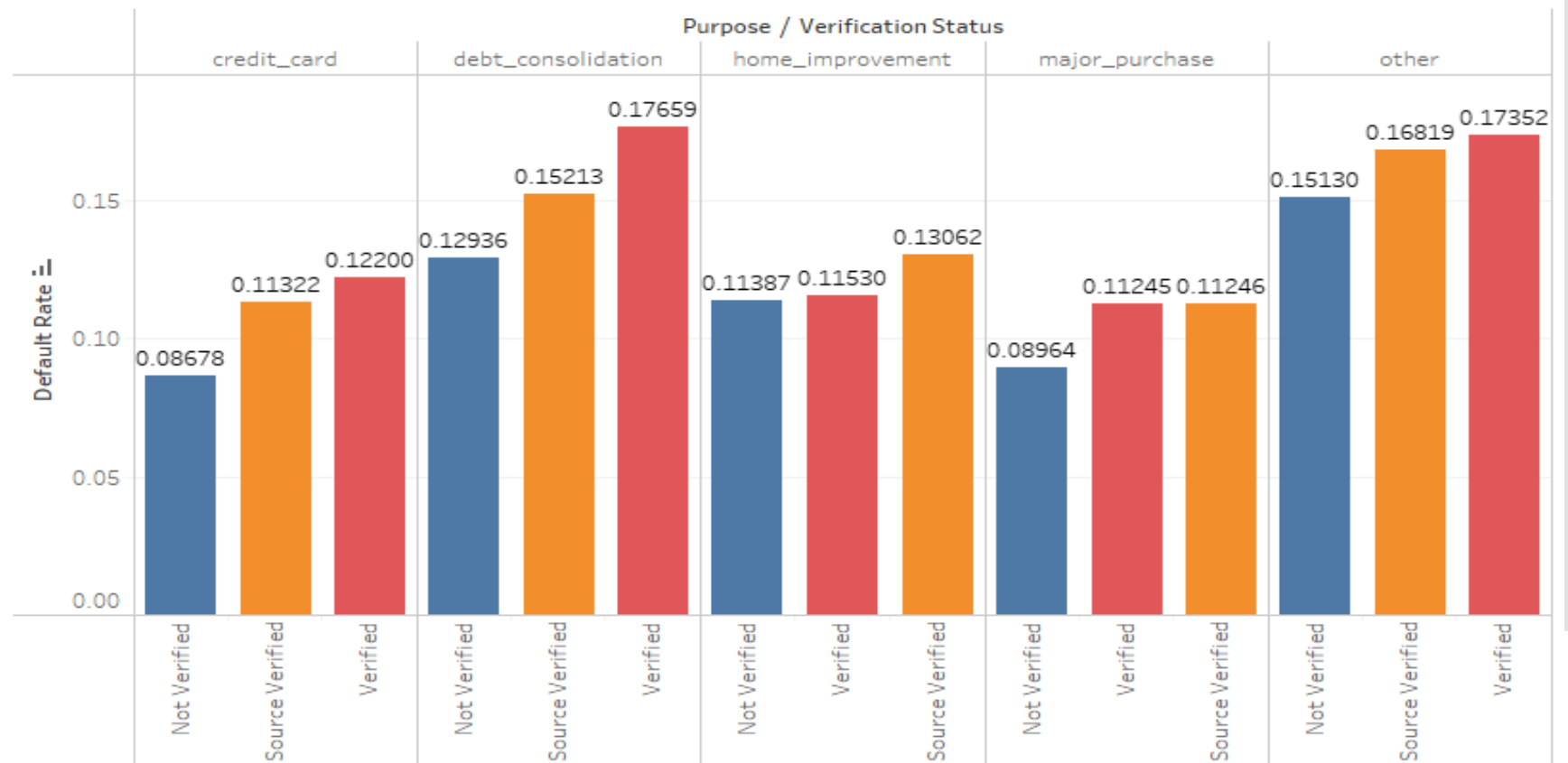


Default Rate Across Verification Status and Purpose

Verification Status	Default Rate(%)
Not Verified	12
Source Verified	14
Verified	16
Difference (max – min)	4

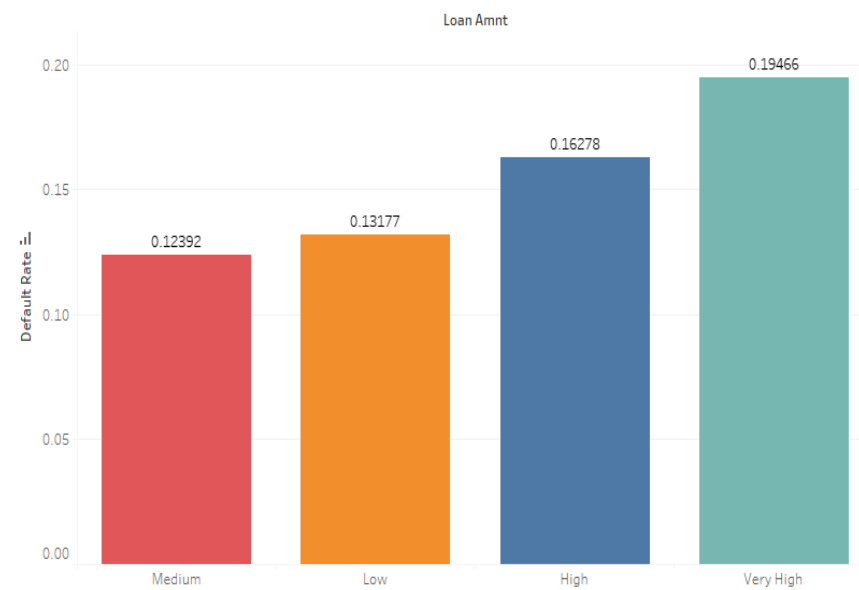


It is surprising that Verified people defaults more than the non-verified people. And the trend is same for each loan purpose. So giving loans to non-verified people is not a bad idea and profit to the company.

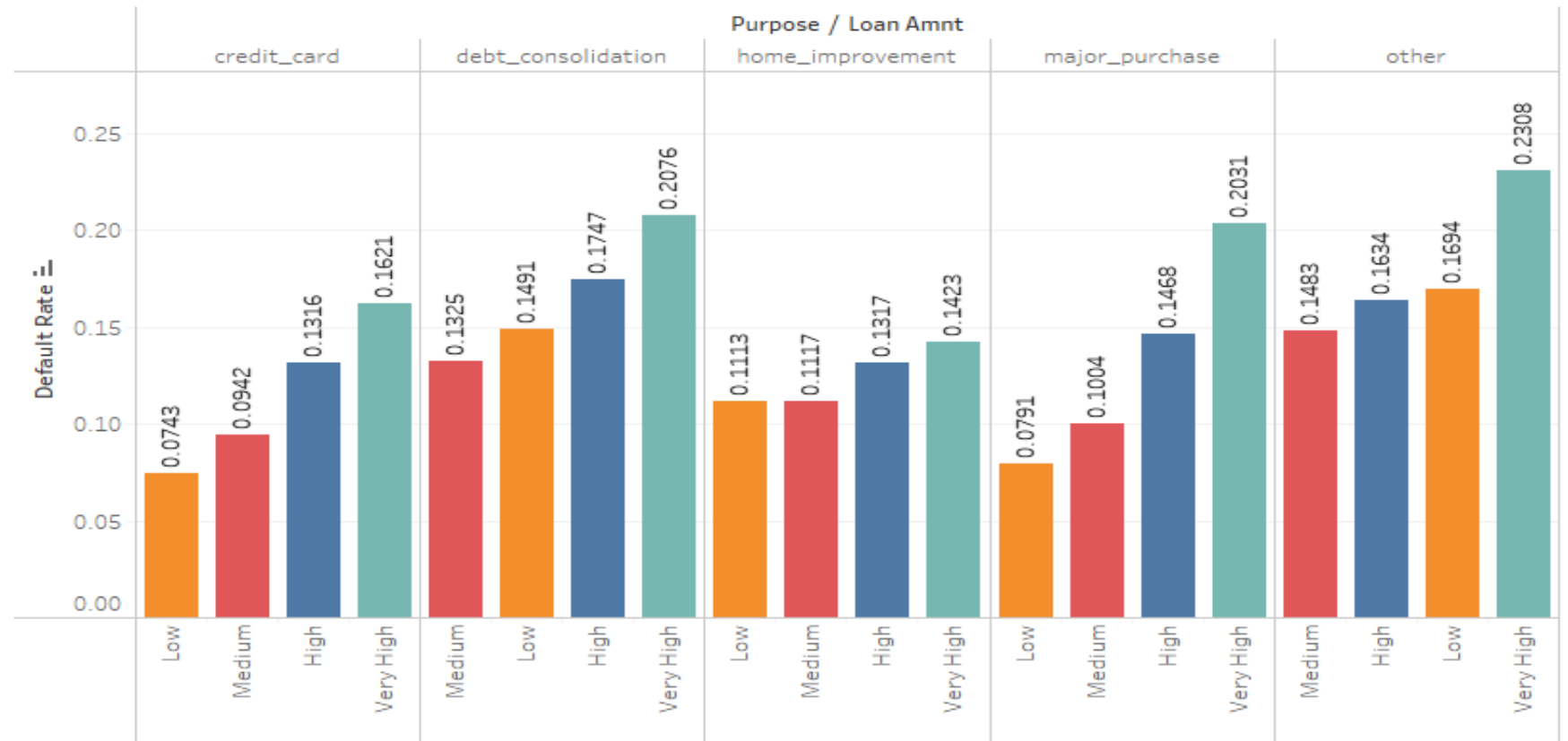


Default Rate Across Loan Amount and Purpose

Loan Amount	Default Rate(%)
Medium	12
Low	13
High	16
Very High	19
Difference (max – min)	7

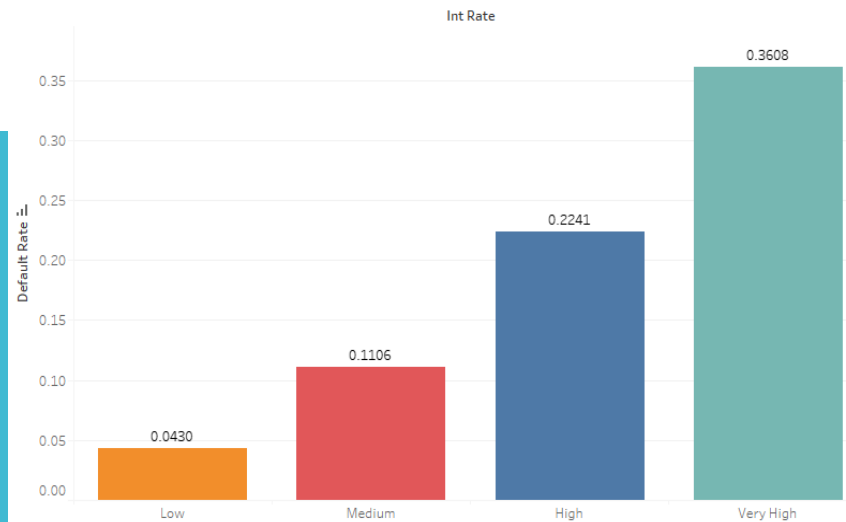


People tend to default more when the amount of loan is Very High as it becomes difficult to repay huge amount of loan.

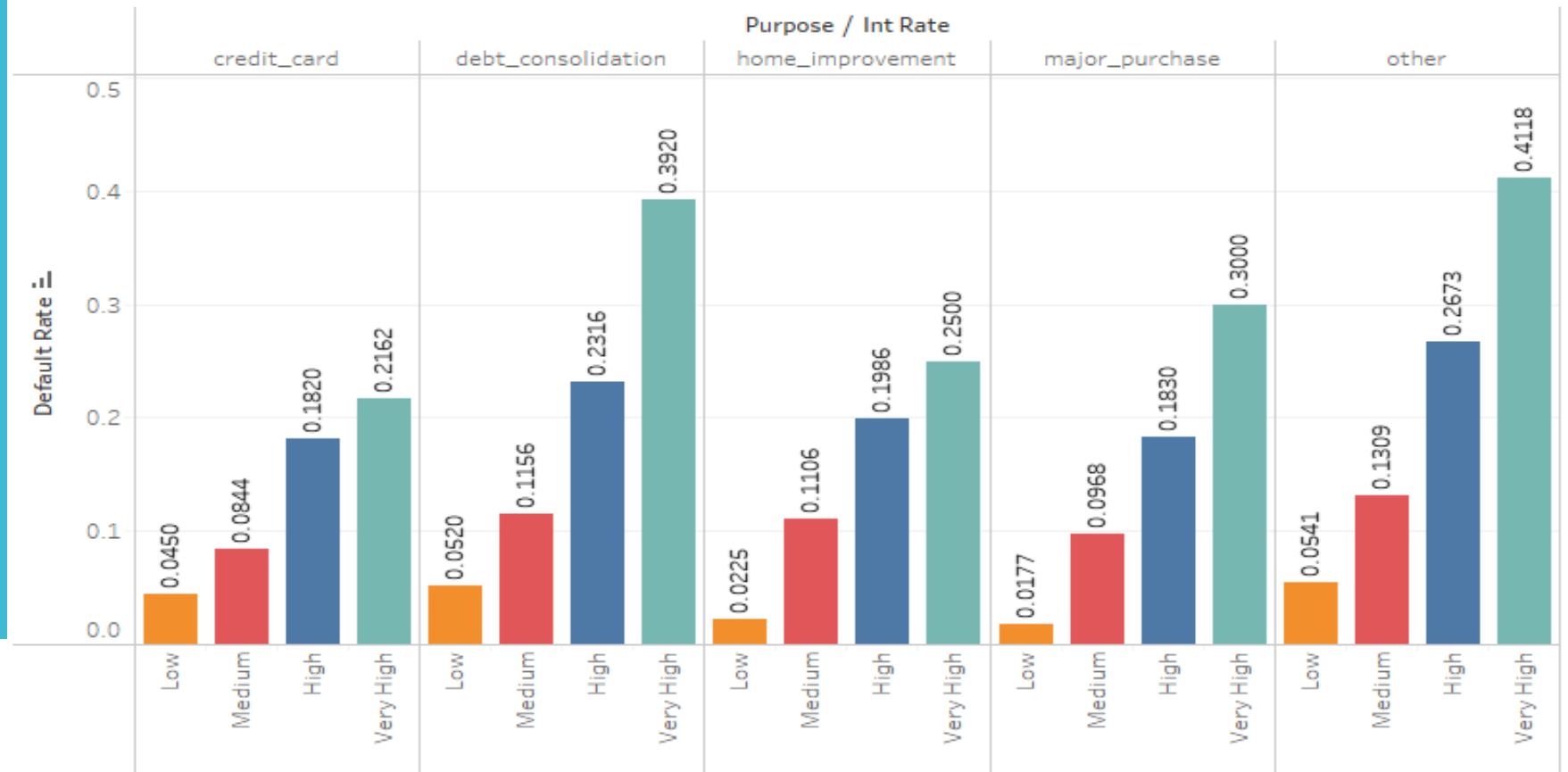


Default Rate Across Interest Rate and Purpose

Interest Rate	Default Rate(%)
Low	4
Medium	11
High	22
Very High	36
Difference (max – min)	32

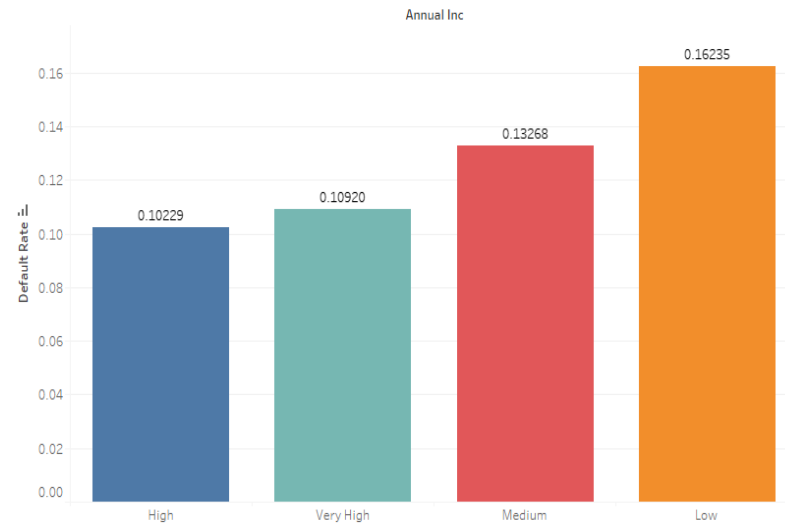


As the interest rate increases, it becomes more irritating and more difficult to repay loan which cause the person to default. So, if the company gives a loan at very high interest rate in order to earn more, there is a huge chance that the person will default which is a loss for the company.

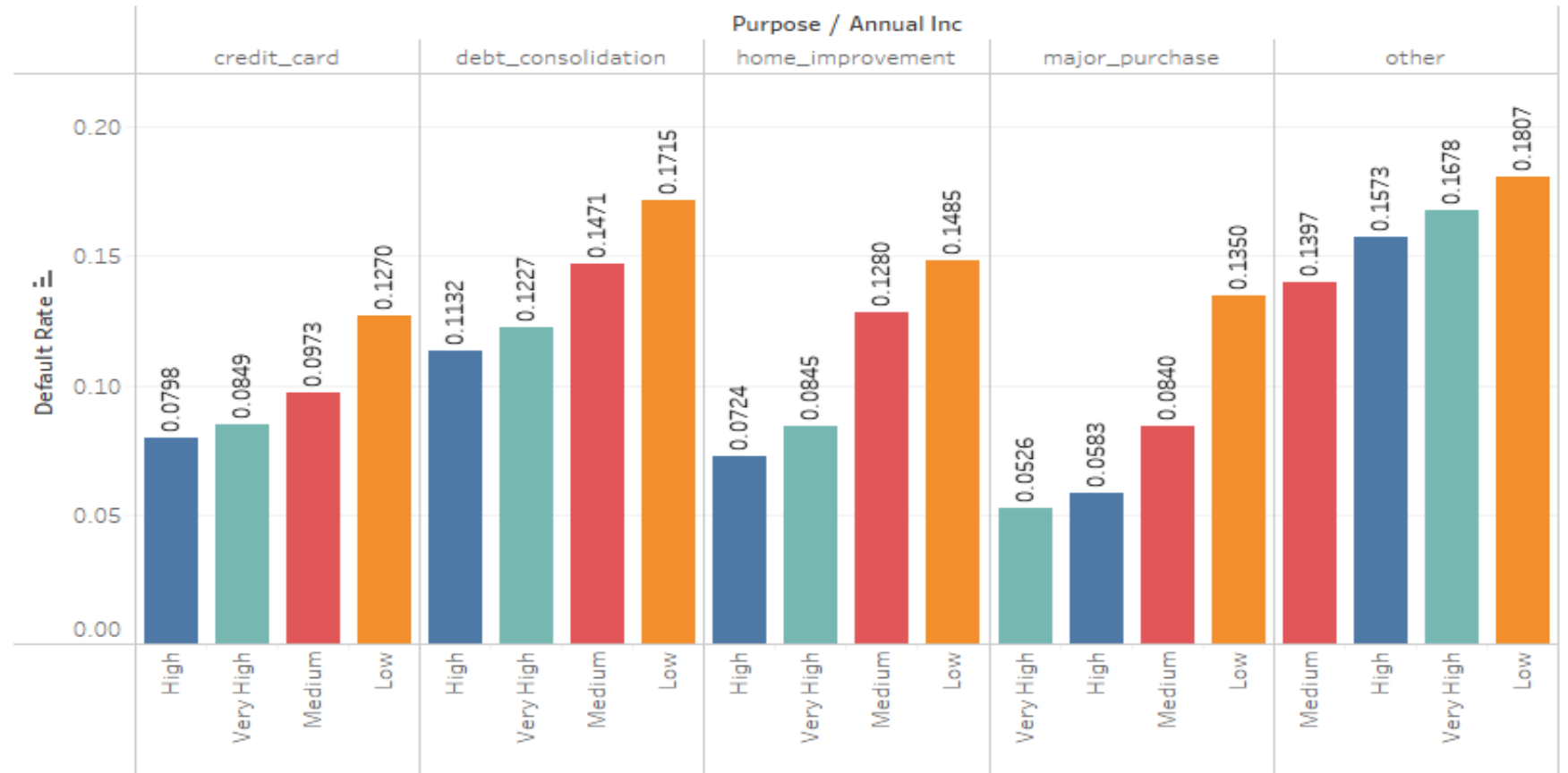


Default Rate Across Annual Income and Purpose

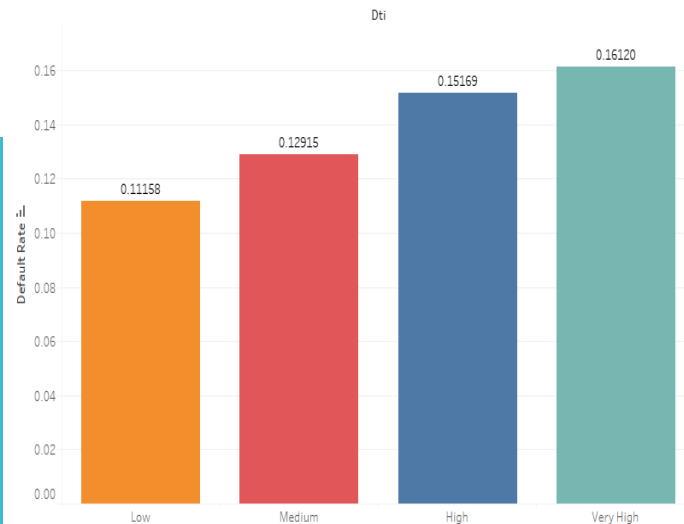
Annual Income	Default Rate(%)
High	10
Very High	11
Medium	13
Low	16
Difference (max – min)	6



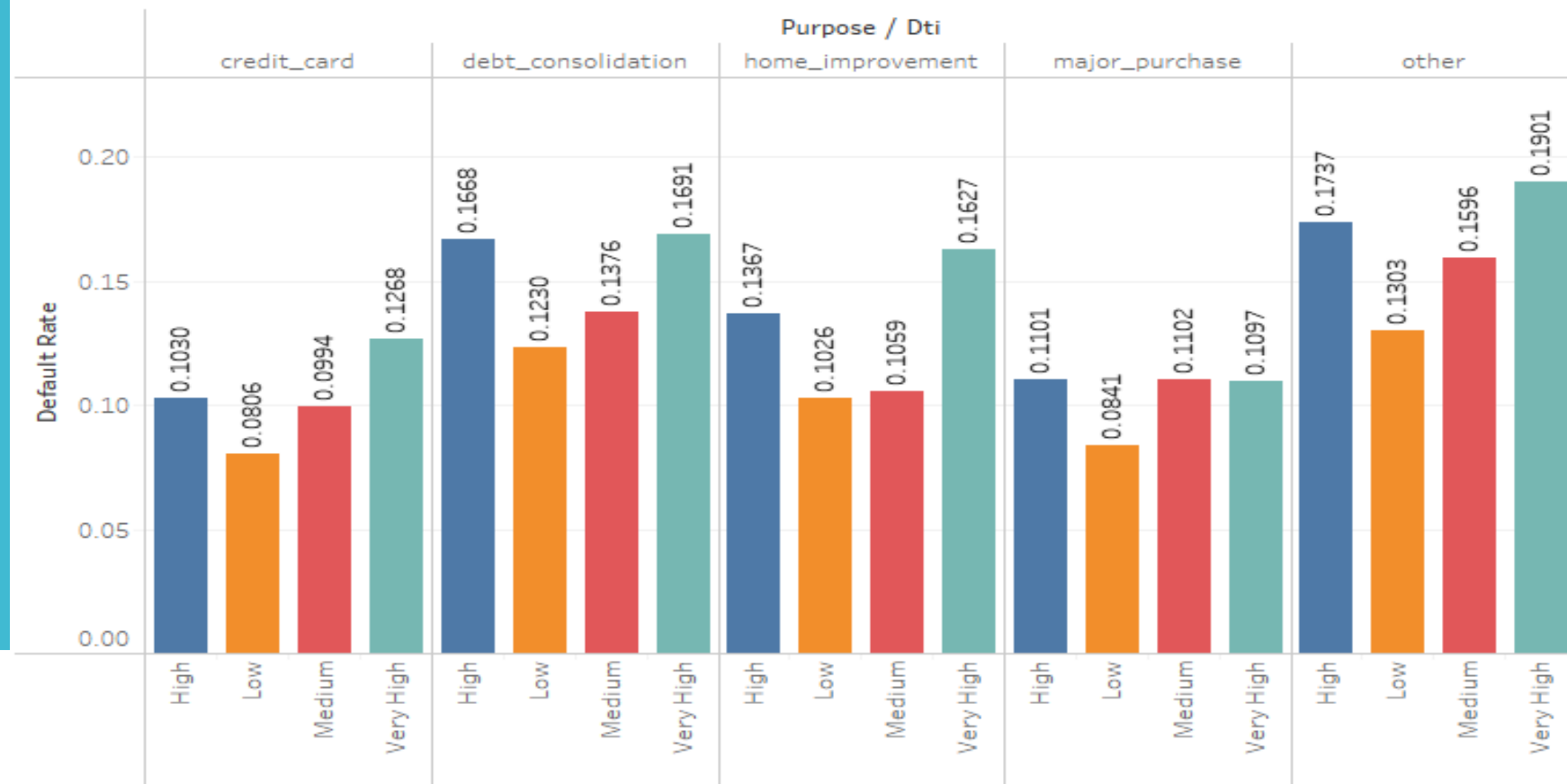
People who have low annual income are more likely to default their loan. So it is a loss for the company in giving more loans to the people with low annual income.



Default Rate Across DTI (Debt to Income Ratio) and Purpose



People who have took high loan amount and have low annual income more likely to defaults their loan. It's a loss for the company if the company gives huge amount as loan to the people who have high DTI (debt to income ratio).



Driving Factors behind Loan Default

- Purpose : Purpose of loan is the most important factor behind loan default. Default rate of purpose like 'Other' and 'Debt Consolation' is high.
- Term : Term is the tenure of the loan. Default rate for '60 months' tenure is comparatively very high than '36 months' tenure.
- Grade : Grade is one the most important factor behind loan default. Default rate of people in grade like 'F', 'G' and 'E' is very high.
- Interest Rate : Default rate for loans with higher interest rate is very high.
- Annual Income / Loan Amount / DTI : Default rate high for low annual income, high loan amount and high DTI (debt to income ratio) value.

Conclusions

- The company should refrain from giving hefty loans to the customers seeking loan for debt consolation and other purpose. But the large number of customers takes loan for debt consolation so if loans are given then the company should ask for some collateral.
- The company should refrain from giving loans to the customers for '60 months' tenure to limit the default cases.
- The company should refrain from giving loans to the customers with lower grades like 'F', 'G', and 'E' to limit the default cases.
- There should be some form incentive for the customers who are likely to pay and penalties for the customers who are more likely to default. This can be achieved by offering lesser interest rate to the customers who are likely to pay than the one who is more likely to default.
- The company should refrain from giving hefty loans to the customers with low annual income and high DTI. If loan is given, the interest rate for such customers must be low or medium. Instead the company should give loans to the customer with high annual income on higher interest rates.

Thank You

