

LENDING CLUB CASE STUDY

SUBMISSION

Name:

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Problem Statement

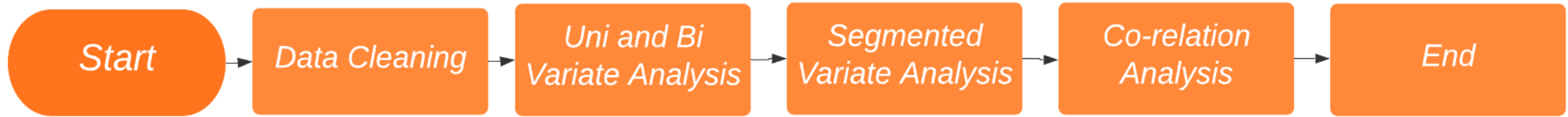
1. Lending Club is a consumer finance company which specializes in lending various types of loans to urban customers.
2. Each Loan Application has Two risks
 - a. If the applicant is likely to repay the loan, then not approving the loan results in a loss of business to the company.
 - b. If the applicant is not likely to repay the loan, i.e. he/she is likely to default, then approving the loan may lead to a financial loss for the company.

We can identify these risky loan applicants, then such loans can be reduced thereby cutting down the amount of credit loss.

Goal:

Identify driving factors which are strong indicators of default.

Flow of Analysis

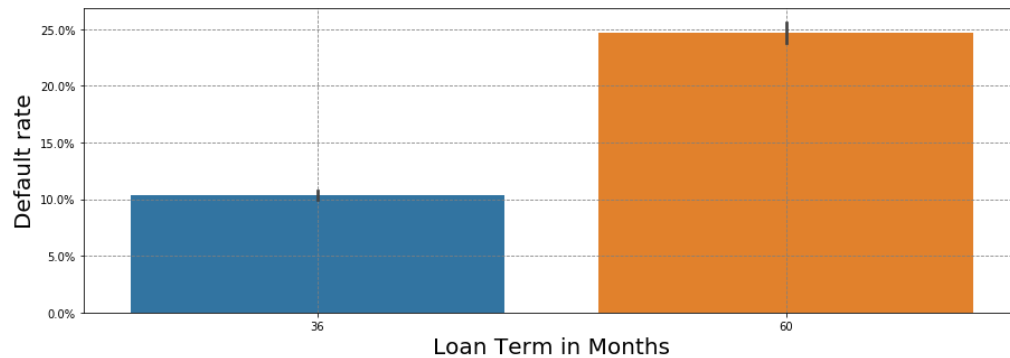


Driving Factors

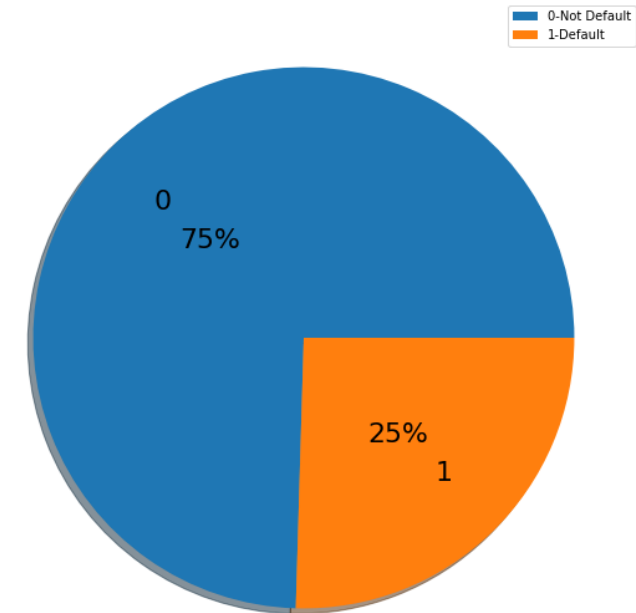
Interest Rate:

1. Default Rate is increasing with the interest rate.
2. Applicants with High Interest Rate(i.e. $>15\%$) are 25% likely to default on the loan.

Loan Term vs Default rate



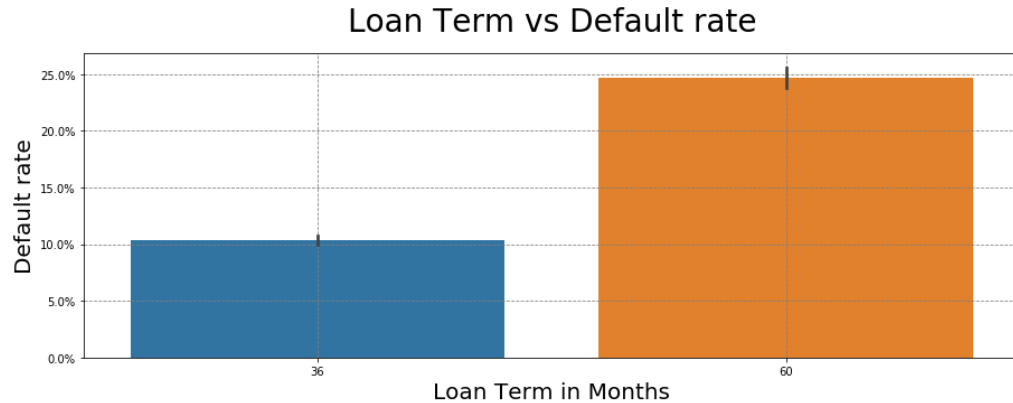
Loan default % in High Interest Rate Segment



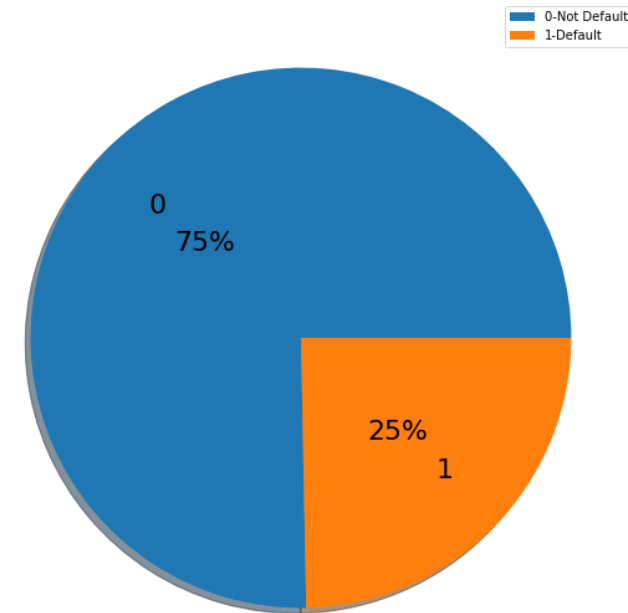
Driving Factors

Term:

1. Applicants with High term value (60 months) have default rate.
2. Among all the applicants with term 60 months ,25% of the are likely to default on the loan.



Loan default % in 60 months term Segment

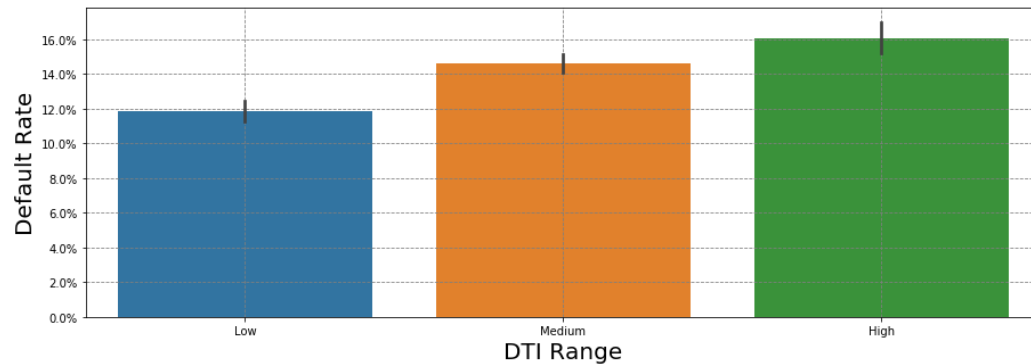


Driving Factors

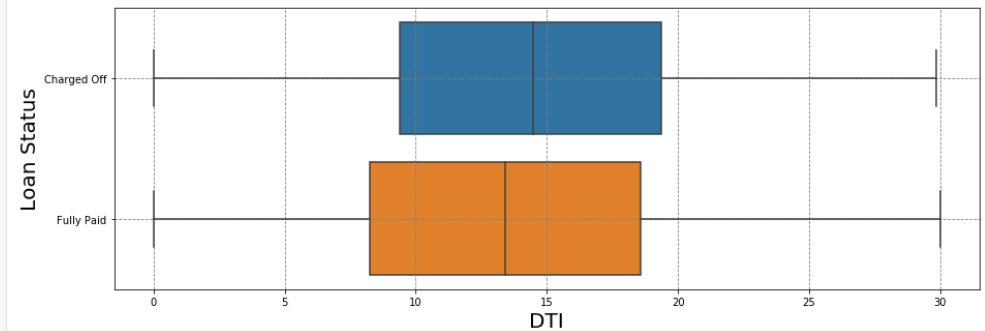
Debt To Income Ratio(DTI):

1. As the DTI increases the default rate increases.
2. About 16% of the applicants with high DTI(>20) default on loans.
3. It's observed that fully paid loans have lower dti than charged off loans.

DTI vs Default Rate



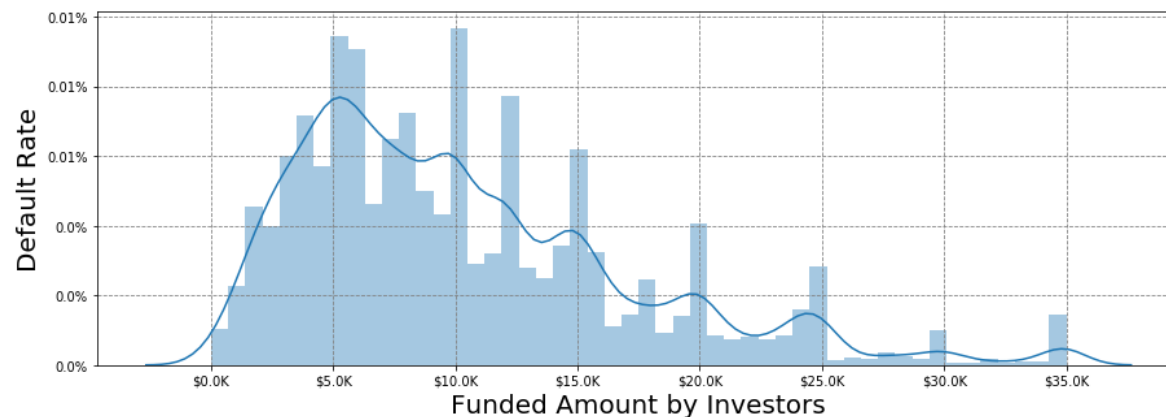
DTI vs Loan Status



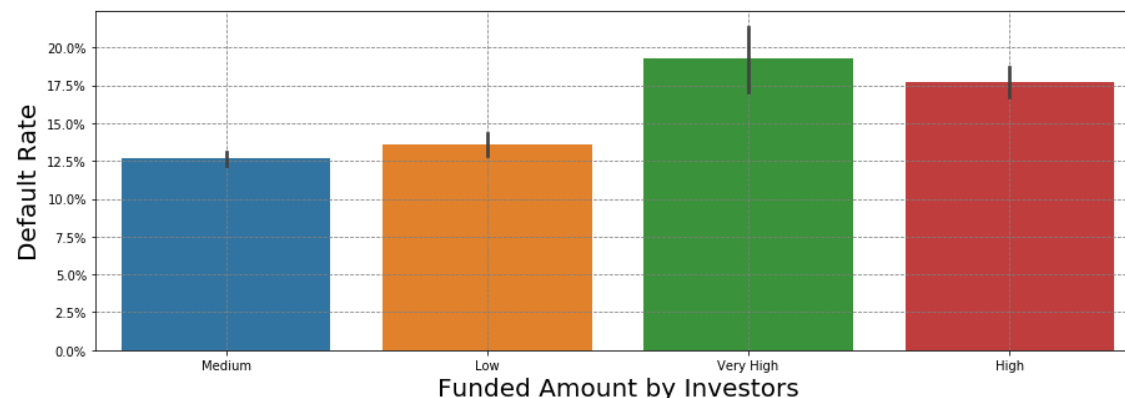
Funded Amount by Investors:

1. Majority of the funded amount by investors is from 5K to 15K and there are few higher value loans as well.
2. Charged off loans are increasing with increase in Funding amount by investors. For funding amount in very high range(>\$25K), the default rate is 19%.

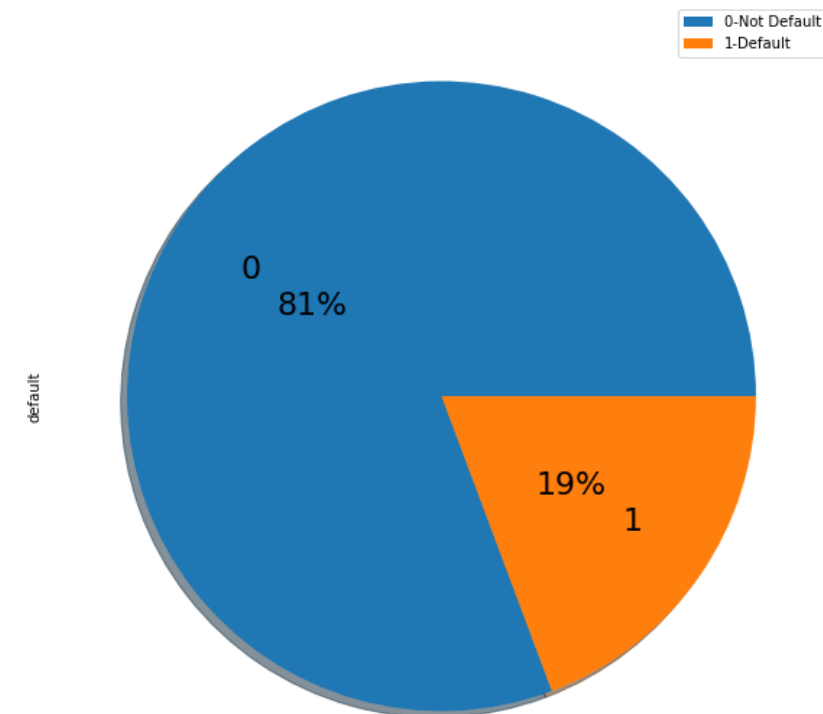
Funded Amount by Investors vs Average Default Rate



Funded Amount by Investors vs Default Rate



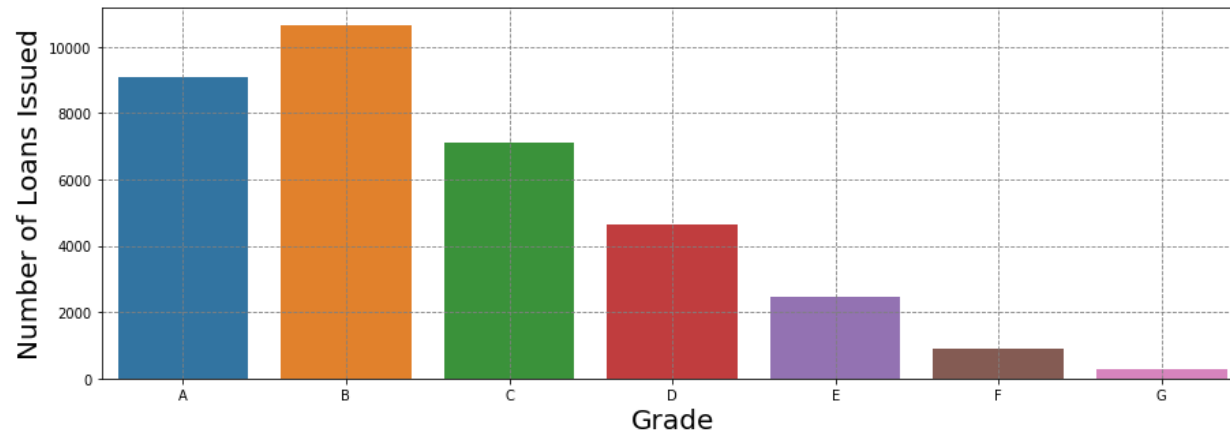
Loan default % in very high Funded Amount by investors Segment



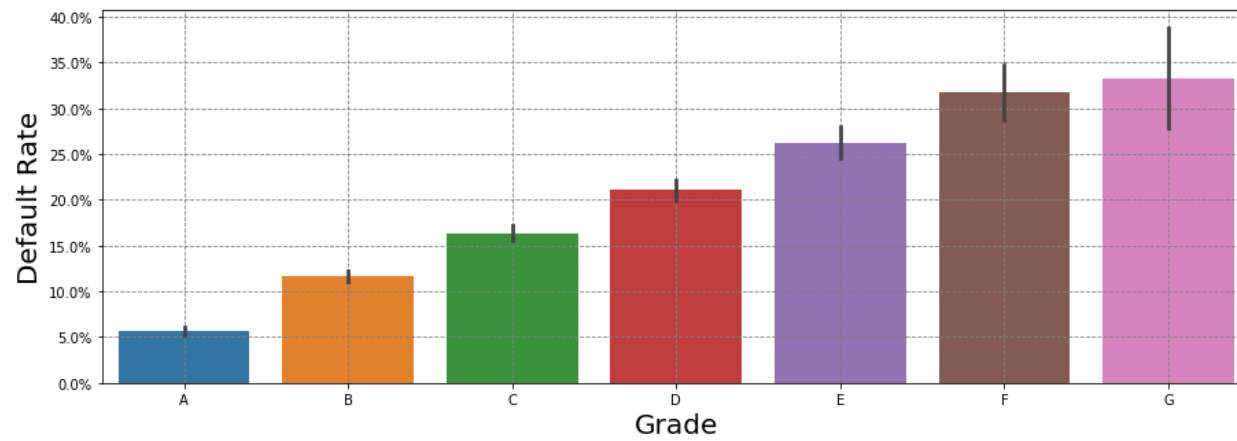
Grade:

1. From Grade A to G, the default rate increases dramatically.
2. From Grade E onwards, more than 25% of the loans have defaulted. For Grade G, the default rate is as high as 33%.

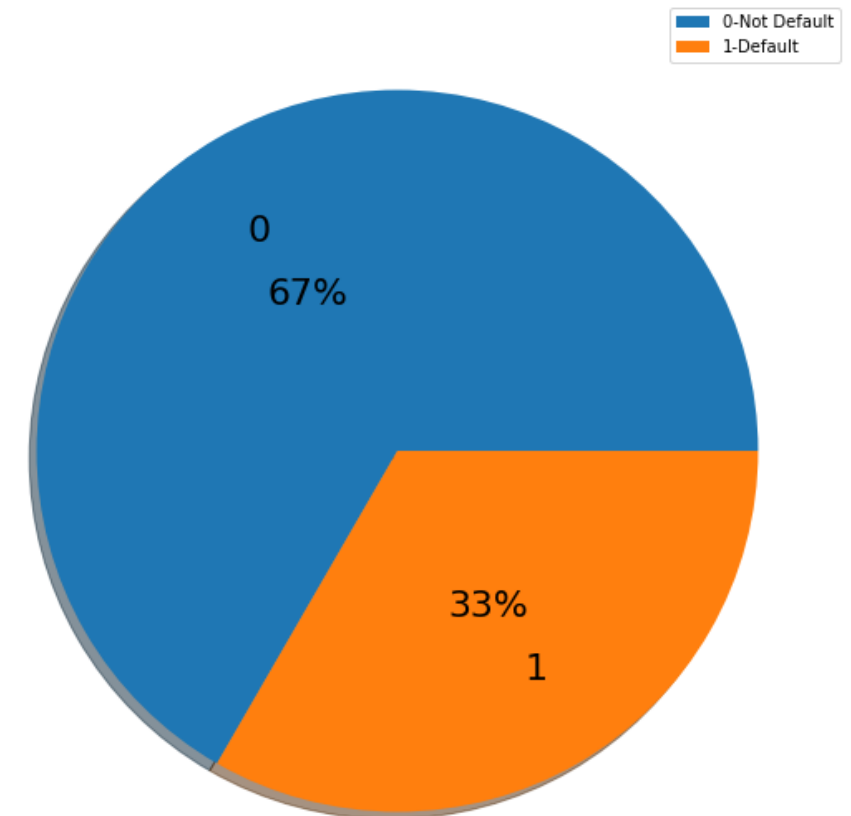
Grade vs Number of Loans Issued



Grade vs Default Rate



Loan default % in G grade

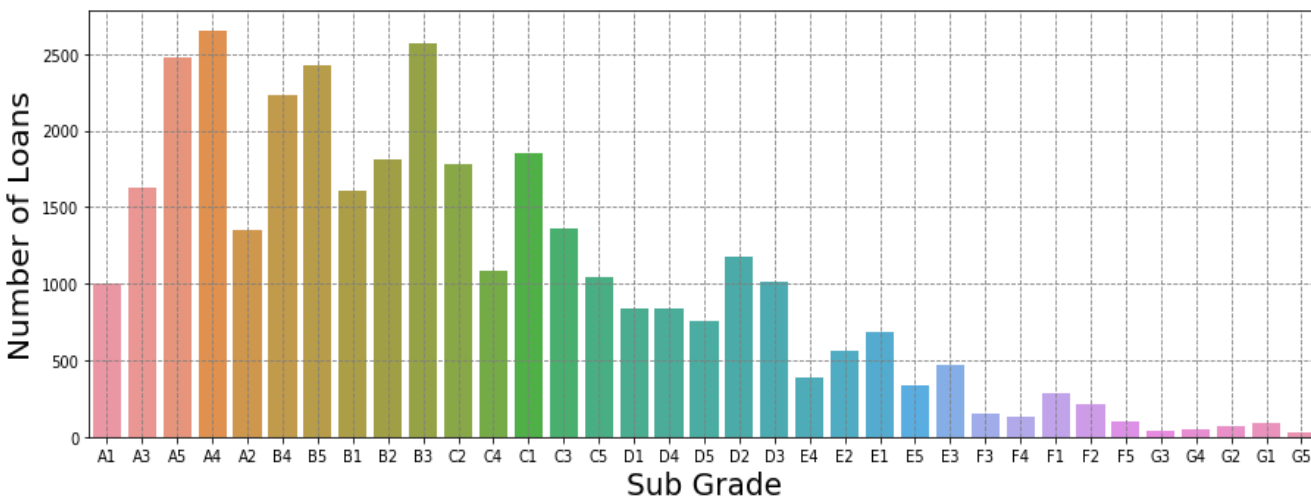




Driving Factors



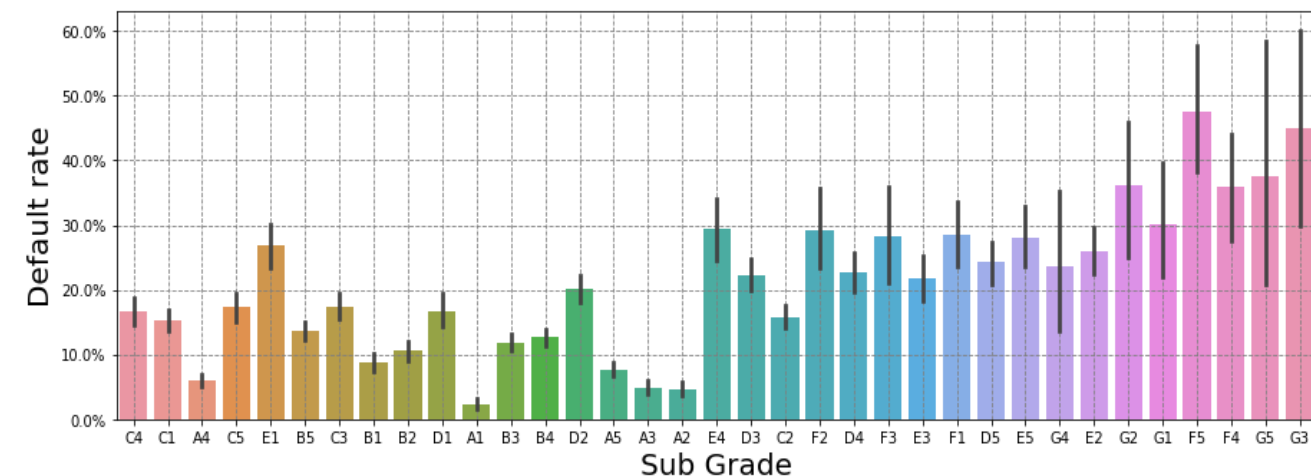
Sub Grade vs Number of Loans



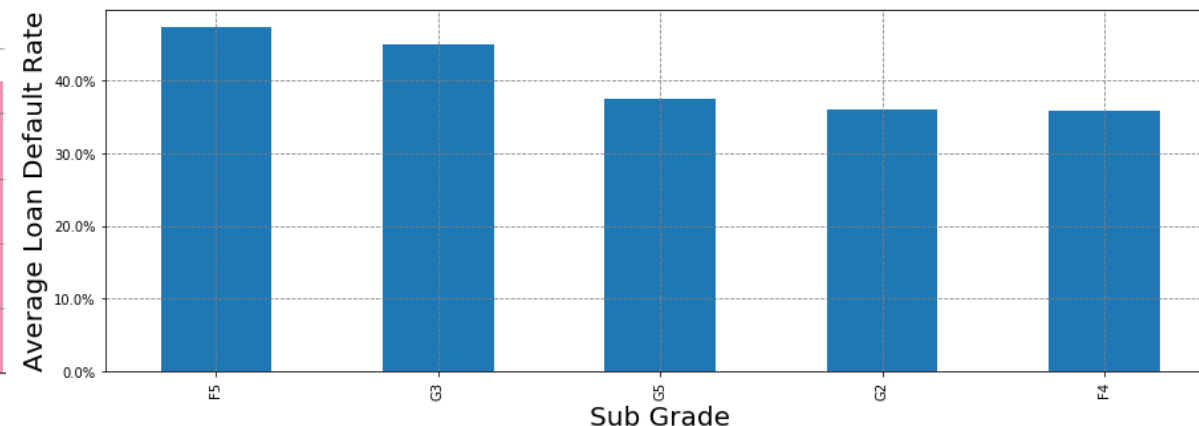
Sub Grade:

1. As the grading is going down there is evidence of increase in default rates, especially in the least grades.
2. Lending club must be extra cautious while lending money to Applicants from grades F5,G3,G5,G2,F4 as they have high chance of default.

Sub Grade vs Default rate



Top 5 Sub-Grades interms of High Default Rate

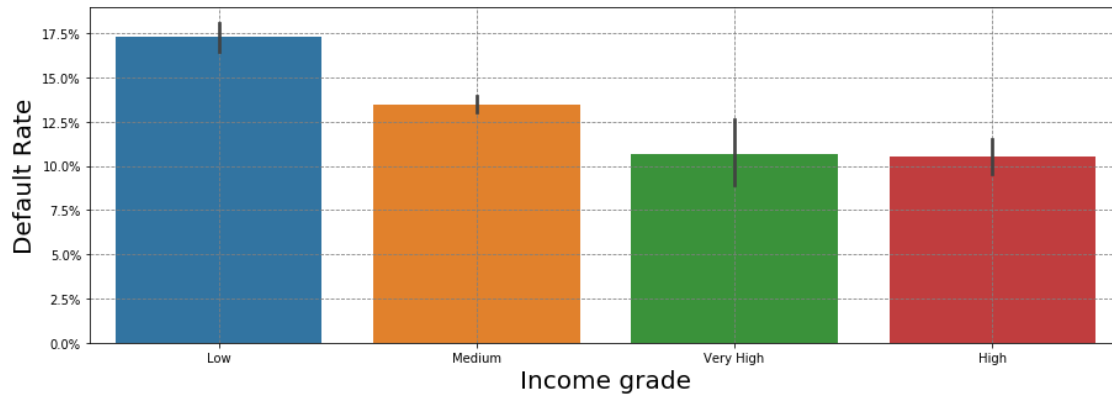


Driving Factors

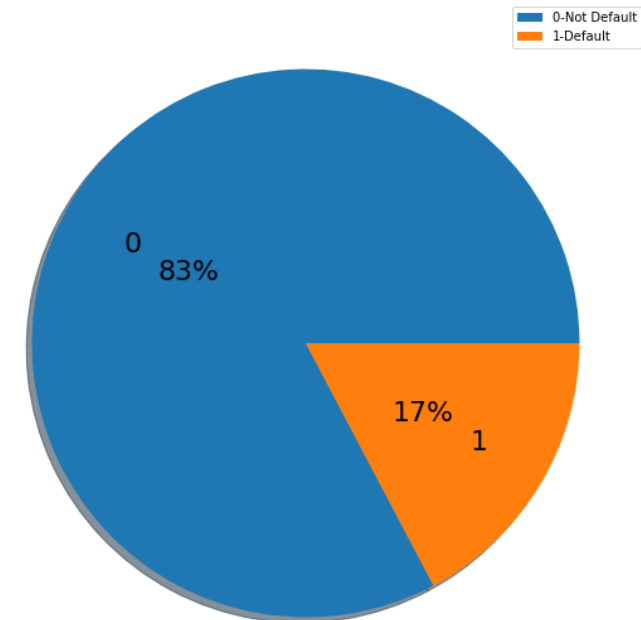
Annual Income:

1. As Annual Income is decreasing default rate is increasing.
2. Applicants with Low Annual Income(<\$40K) have 17% default rate.

Default Rate vs Income grade



Loan default % in Low Annual Income Segment

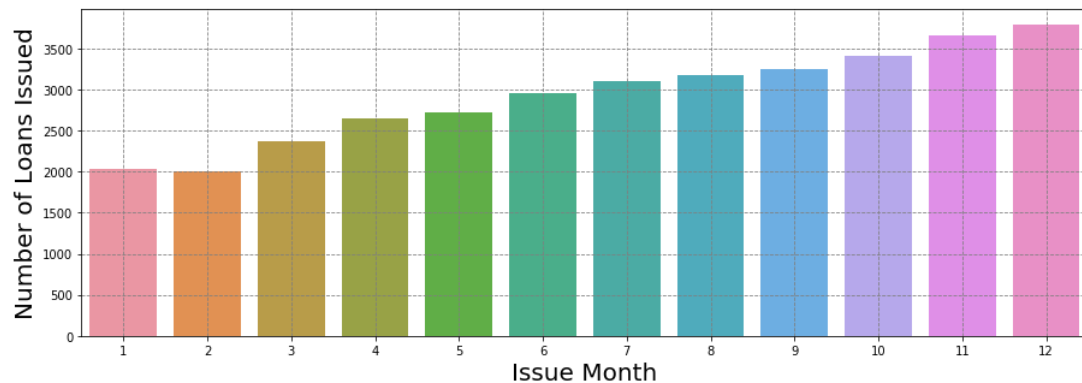


Driving Factors

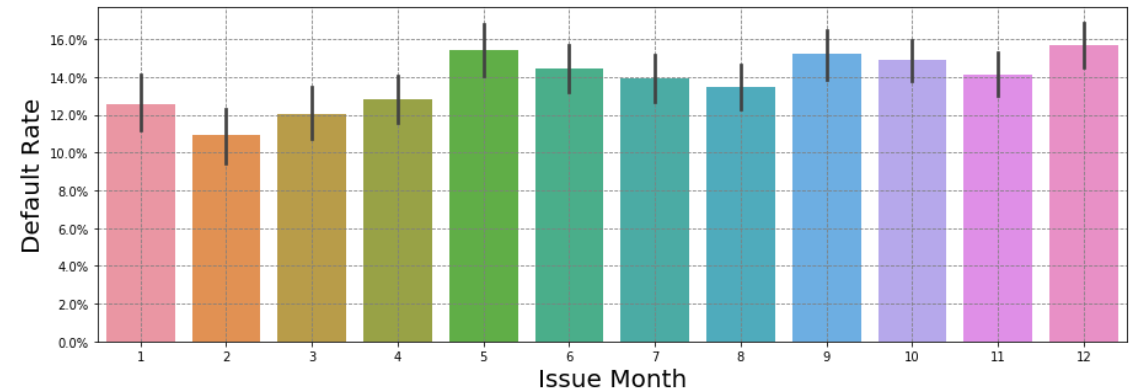
Issue Month:

1. Number of loans issued tend to increase towards the end of the year in the month from 9 to 12.
2. Default rate is high in 9-12-month period. For these months, the default rates have been $>14\%$.

Issue Month vs Number of Loans Issued



Issue Month vs Default Rate

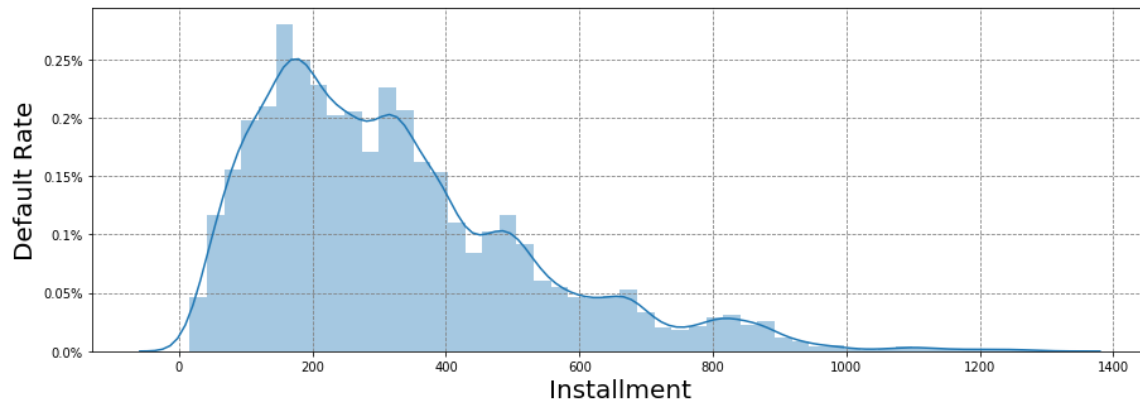


Driving Factors

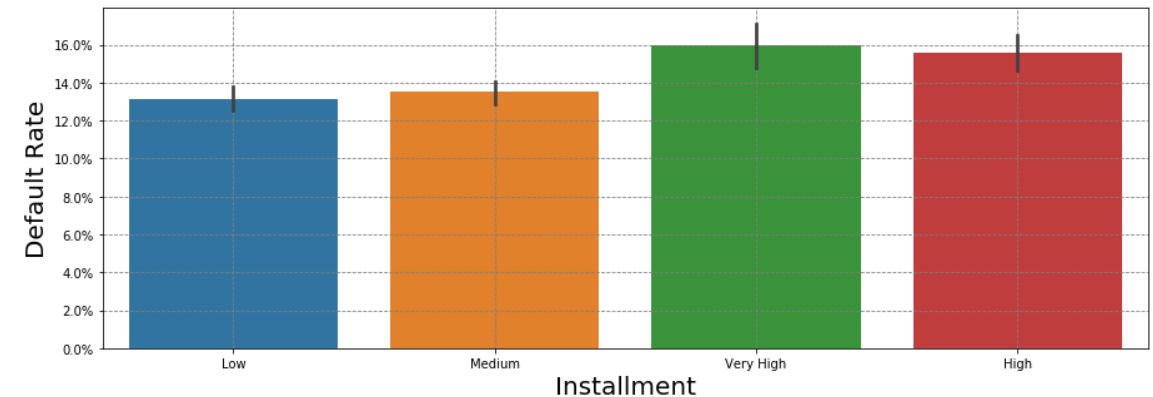
Instalment:

1. As instalment amount increases, the default rate also increases.
2. For the high (between 400 to 600) and very high (>600) levels of instalment, the default rate is 15%.

Instalment vs Default Rate

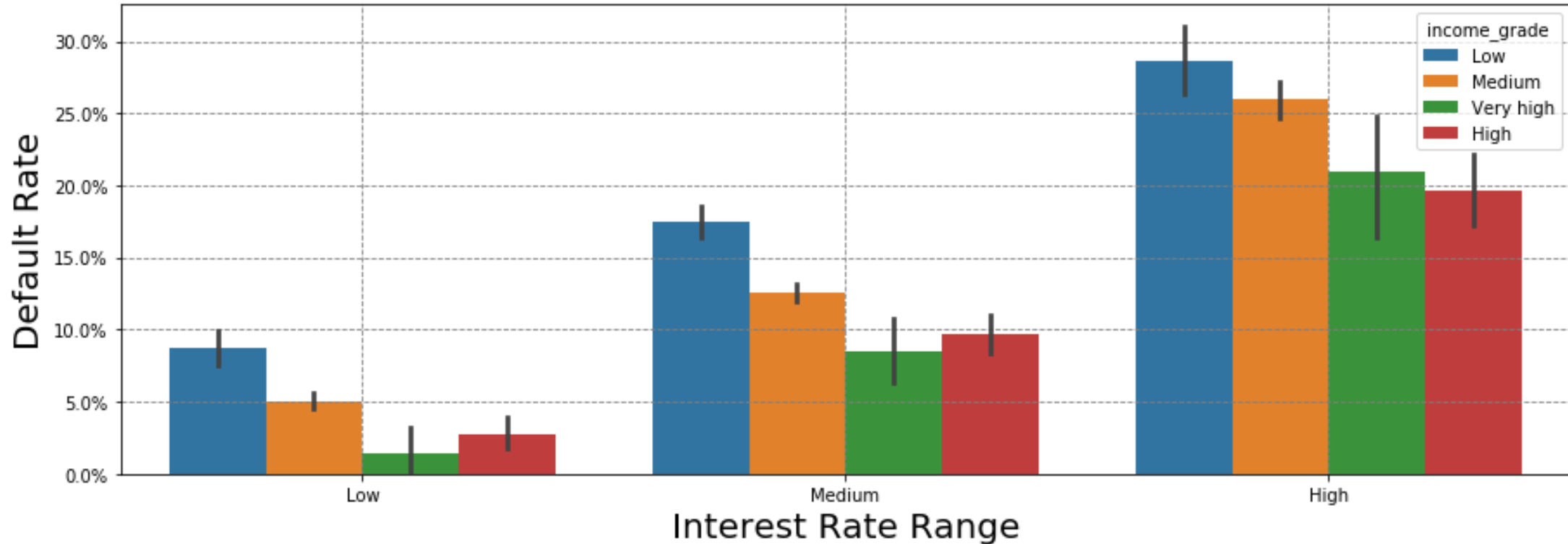


Instalment vs Default Rate



Driver Variable Combinations:

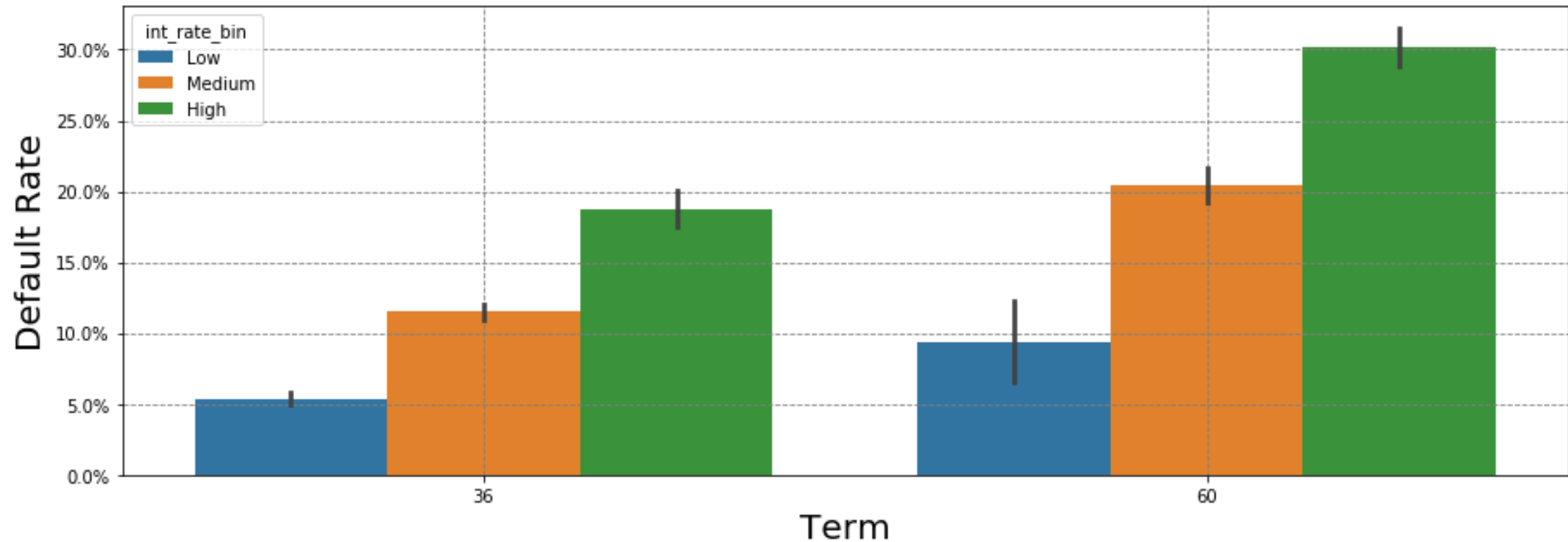
Interest Rate Range and Income Grade Range vs Default Rate



1. Irrespective of the Loan Term , Applicants with Low Annual Income (i.e. < \$40000) have High Default Rates across Low($\leq 9\%$) , Medium(between 9%-15%) and High($>15\%$) Interest Ranges.
2. Low Income Applicants with interest rate in High range(i.e. $>15\%$) have default rate of 29%.

Driver Variable Combinations:

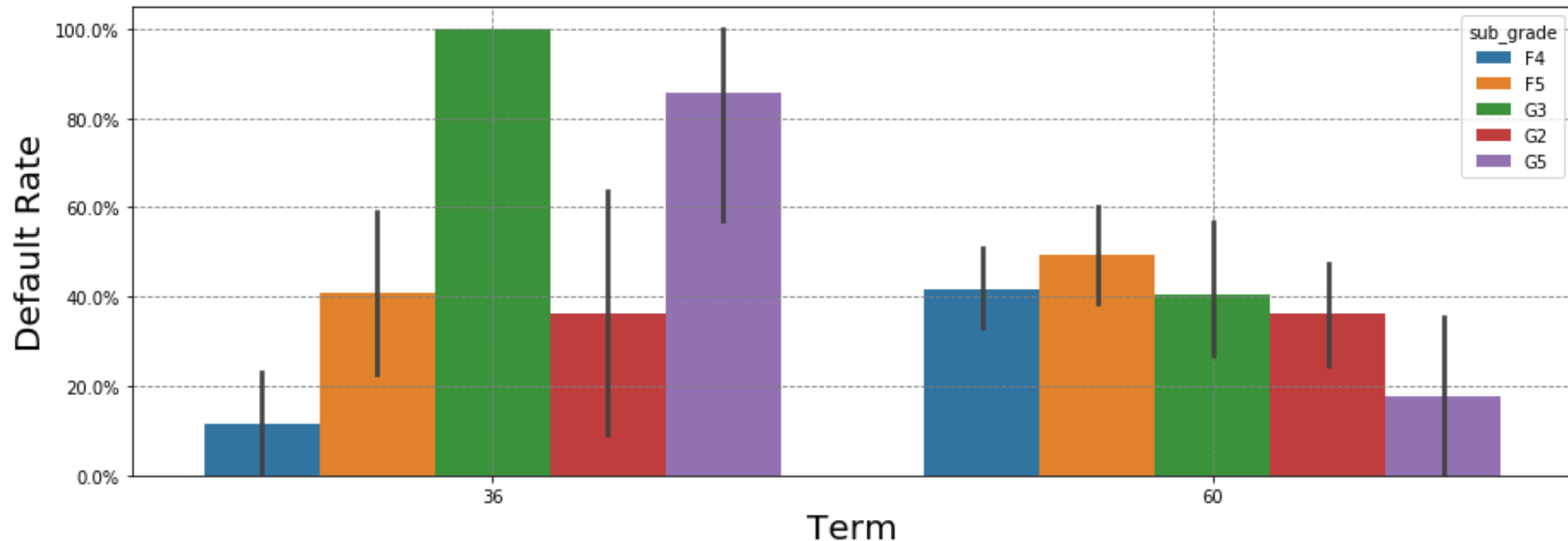
Term and Interest Rate vs Default Rate



1. Across all Loan Terms, increasing interest rates are leading to increasing rate of defaults.
2. Loan Applicants with High Interest Rates with Loan Term 60 months have 30% chance of defaulting on a Loan.

Driver Variable Combinations:

Term and Sub Grade vs Default Rate



In Loan term 36 months we can see that following Sub Grades have Very high default rates.

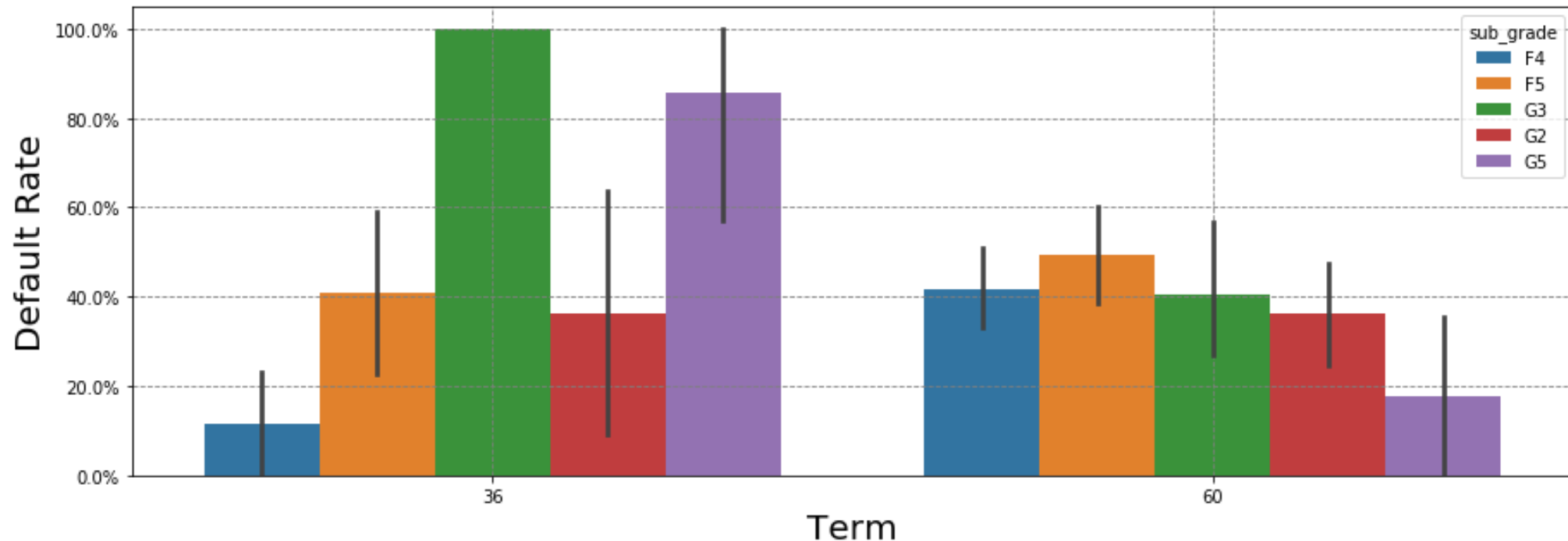
G3 - 100%

G5 - 86%

Note: The No of Applicants who match the above criteria are very Low in the current data. We need additional data to gain more confidence on this observation.

Driver Variable Combinations:

Term and Sub Grade vs Default Rate



In Loan term 36 months we can see that following Sub Grades have Very high default rates.

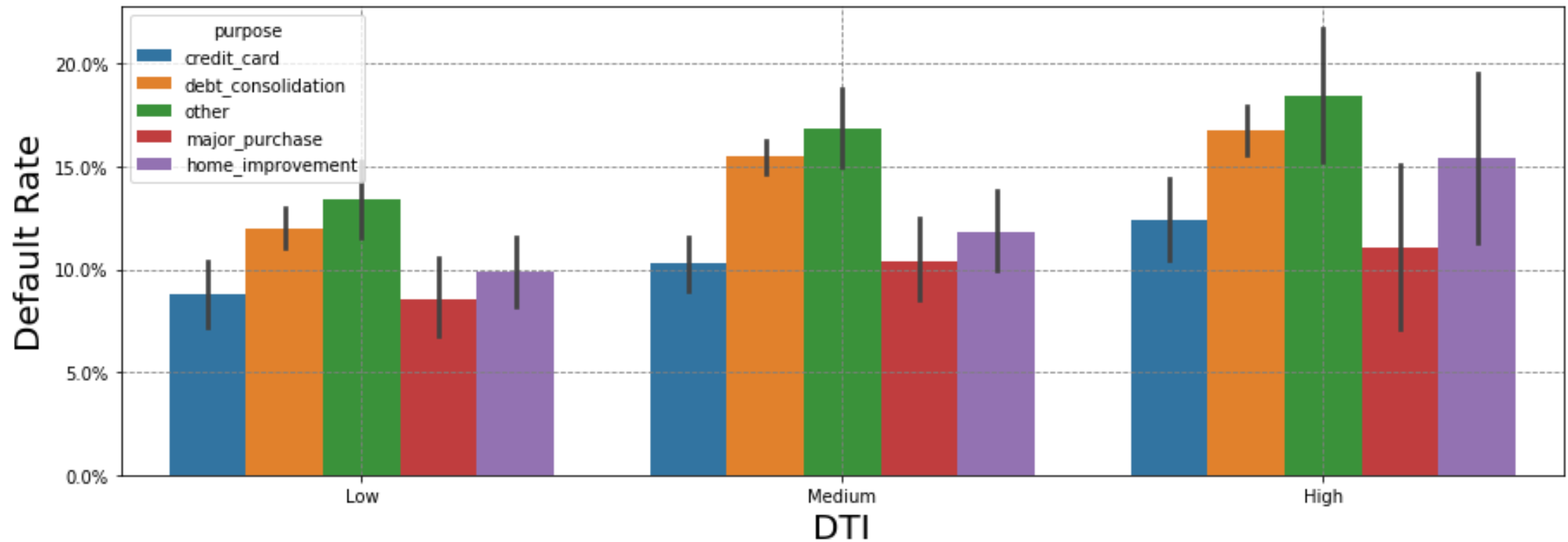
G3 - 100%

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Note: The No of Applicants who match the above criteria are very Low in the current data. We need additional data to gain more confidence on this observation.

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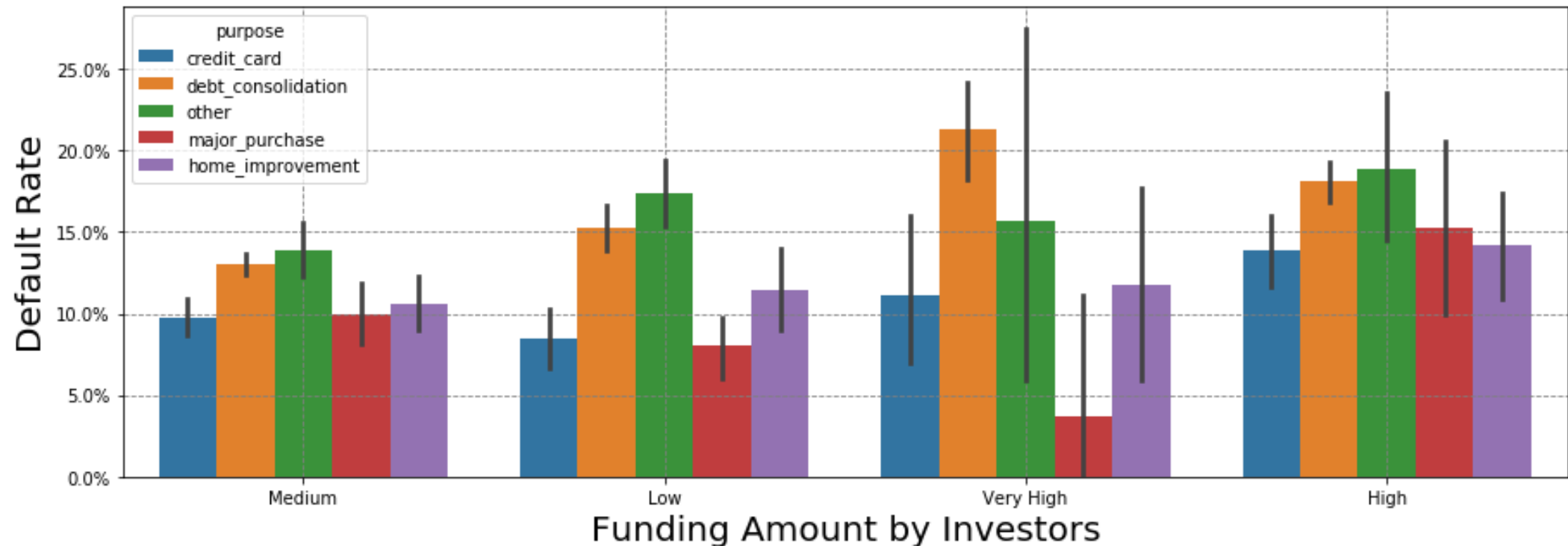
DTI and Purpose vs Default Rate



Irrespective of DTI range Other, Debt consolidation categories in purpose have high rates of default. As the DTI increases , default rates in these two categories are increasing.

Driver Variable Combinations:

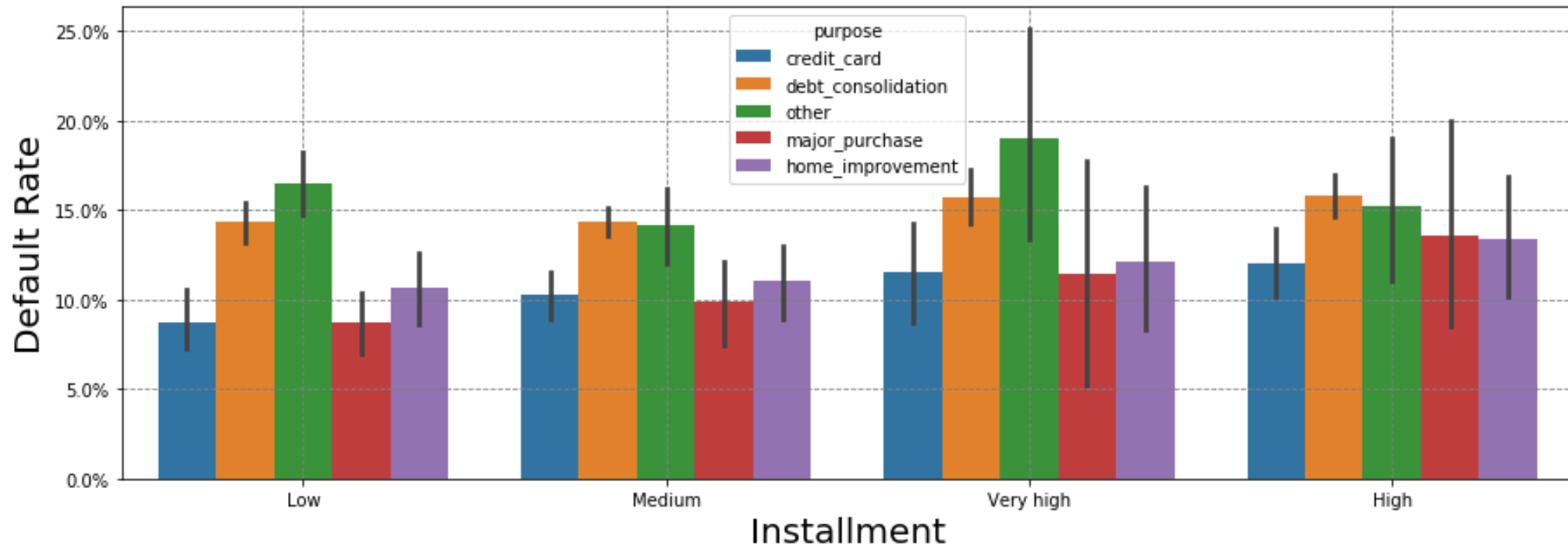
Funding Amount by Investors and Purpose vs Default Rate



Irrespective of Funding Amount by Investors range, Other and debt consolidation loan purpose categories have consistently high default rates.

Driver Variable Combinations:

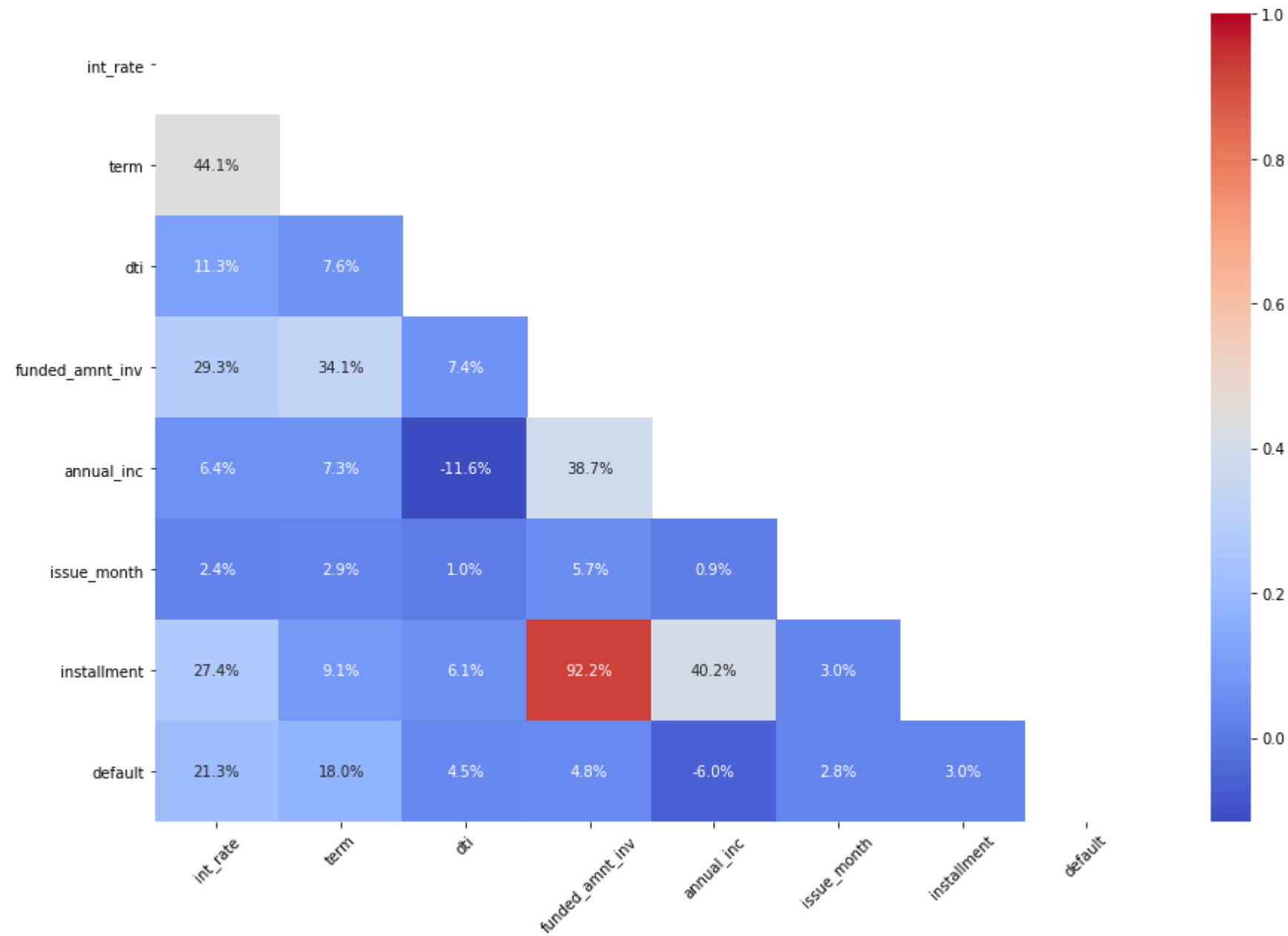
Installment and Purpose vs Default Rate



In Very High Installment Range Loan purpose categories Other, debt consolidation have high default rate.



Driver Variable Co-relations:



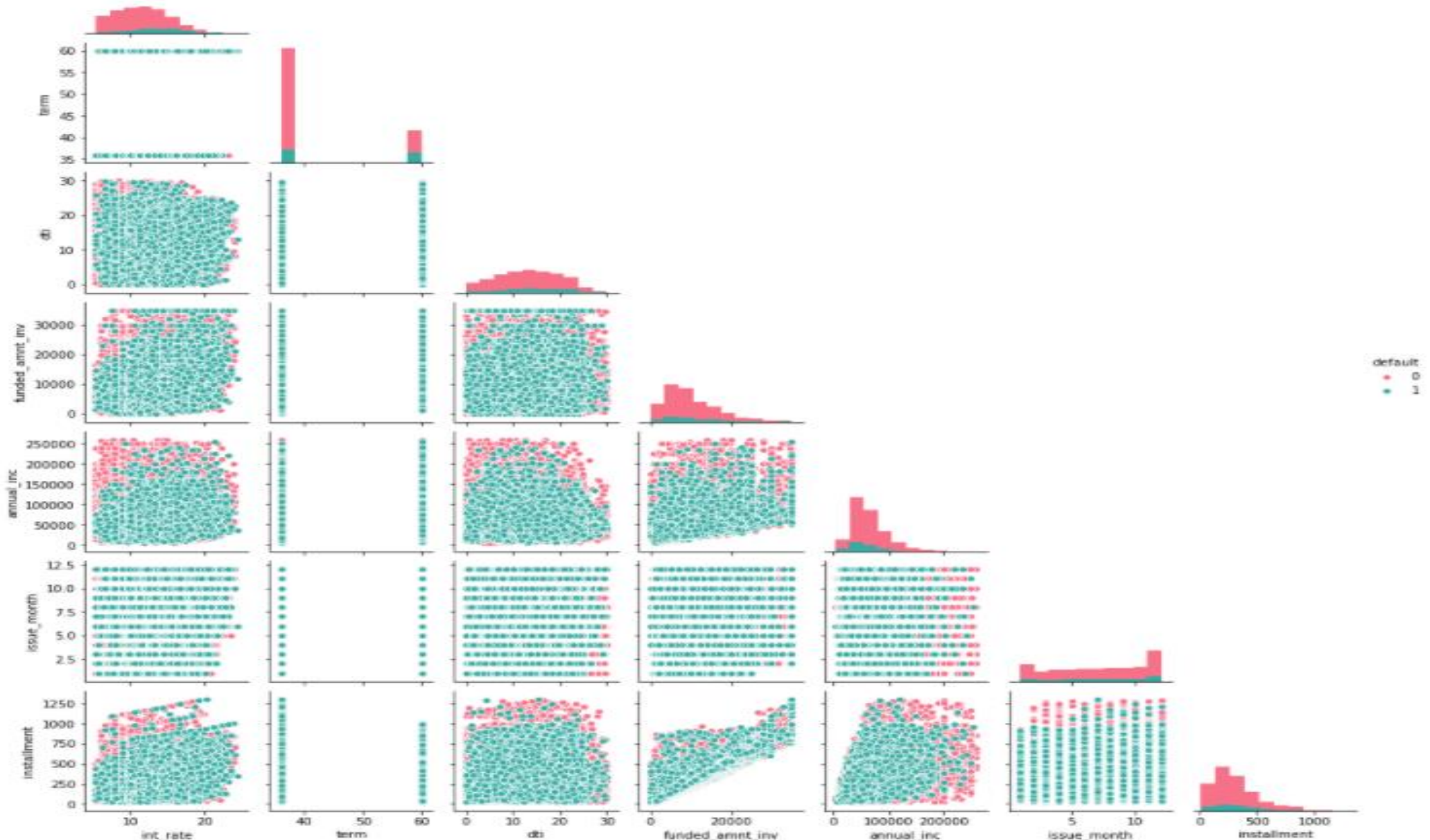
Key Observations:

1. term and interest have a positive co-relation of 44.1%.
2. term and funded amount by investors have a positive co-relation of 34.1%.
3. interest rate and funded amount by investors have positive co-relation of 29.3%.
4. interest rate and installment have positive co-relation of 27.4%.
5. annual income and funded amount by investors have positive co-relation of 38.7%.
6. annual income and installment have positive co-relation of 40.2%.
7. default rate and interest rate have positive co-relation of 21.3%.
8. default rate and term have positive co-relation of 18.0%.
9. funded amount by investors and installment have positive co-relation of 92.2%.



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Driver Variable Co-relations:



Summary:

Key Observations:

Lending club must be cautious during loan approval in the following scenarios:

1. Low Income Individuals for High Interest Rates for 60 months term.
2. When Loan purpose is Other , Debt Consolidation and Small business.
3. Applicants who have Grade \geq E.
4. Lending to Sub Grades F5,G3,G5,G2,F4.
5. Applicants who have high dti ratio and high installment amount.
6. Issuing Loan month is in 9-12-month period.
7. Funded Amount by Investors is Very High(>\$25K).

Suggestions:

1. For above scenarios interest rate can be increased so that recovered money would be higher than usual as default chances are high.
2. We observed that verified loans are prone to high default rate. Lending Club needs to review the verification process and add more checks.