

# **Loan Risk & Repayment Analysis Dashboard**

**A Study on Loan Size, Interest Bands & Default Risk**

## **Sector**

Banking & Financial Services – Consumer Unsecured Lending

## **Team Members**

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# 1 Executive Summary

## Problem

Financial institutions often struggle to connect loan characteristics with repayment outcomes.  
Weak segmentation results in:

- Higher default rates
- Mispriced loans
- Inefficient credit allocation

## Approach

Using a cleaned dataset of **49,999 consumer unsecured loans**, this project performs:

- Data Cleaning
- Feature Engineering
- KPI Framework Design
- Pivot Table Analysis
- Interactive Dashboard Development (Google Sheets)

Segmentation was built using:

- Interest Rate Bands
- Loan Amount Bands
- Loan Status

Default behavior was analyzed across these dimensions.

## 2 Sector & Business Context

Consumer lending institutions issue unsecured loans based on borrower financial characteristics.

### **Key Challenges:**

- Credit risk volatility
- Default concentration
- Exposure mispricing
- Portfolio imbalance

Reducing default risk improves:

- Portfolio profitability
- Capital efficiency
- Risk-adjusted returns

## 3 Problem Statement

Banks lack a structured, KPI-driven framework to map loan characteristics to repayment outcomes.

### **Project Objective:**

- Create a measurable KPI framework
- Identify high-risk loan segments
- Build a dashboard for portfolio monitoring

- Provide actionable credit strategy recommendations

## 4 Data Description

**Source:** Public lending dataset (GitHub)

**Records:** 49,999 loans

**Structure:** Row-level loan data (~30 attributes)

### Key Variables Used:

- loan\_id
- loan\_amount
- interest\_rate
- loan\_status

## 5 Data Cleaning & Preparation

All processing performed in **Google Sheets**.

### Steps:

- Converted interest rate from text (%) to numeric
- Standardized loan status categories
- Created segmentation bands:
  - Interest Rate Band
  - Loan Amount Band
- Handled missing values

## **Assumptions:**

- Charged Off = Default
- Fully Paid = Successful repayment
- Current = Active (non-defaulted)

## **6 KPI Framework**

KPI	Value	Business Meaning
Total Loans	49,999	Portfolio size
Total Defaults	7,579	Risk volume
Fully Paid Loans	27,074	Repayment strength
Default Rate	15.16%	Core risk metric

These KPIs form the executive summary layer of the dashboard.

## **7 Exploratory Analysis**

### **Interest Rate Band vs Default**

**Interest Band    Default Rate**

Low              3.67%

Medium        9.01%

High          17.31%

Very High    27.56%

There is a strong monotonic increase in default risk as interest rates rise.

## **Loan Amount Band vs Default**

Default rates increase with larger loan sizes.

Very High loan bands show elevated default concentration.

Medium and High loan sizes represent major exposure pockets.

# **8 Dashboard Design**

**Tool Used:** Google Sheets

**Structure:**

### **Executive Section**

- Total Loans
- Fully Paid
- Total Defaults
- Overall Default Rate

### **Analytical Section**

- Loan Status by Loan Size (Stacked Bar)
- Default Rate by Loan Size
- Loan Status by Interest Band
- Default Rate by Interest Band
- Total Loans by Interest Band (Donut Chart)

#### **Filters:**

- Interest Rate Band
- Loan Amount Band

**Objective:** Provide real-time portfolio risk visibility.

## **9 Key Insights**

- Overall Default Rate = **15.16%**
- Very High interest band default = **27.56%**
- Default risk increases consistently with higher interest rates
- Larger loan sizes show higher default concentration
- Medium and High segments form bulk portfolio exposure

## **10 Business Recommendations**

1. Tighten approvals in Very High interest band
2. Cap exposure in higher loan amount segments
3. Introduce stricter underwriting in high-risk bands

4. Develop Probability of Default (PD) scoring framework
5. Use risk-based pricing for medium-risk borrowers

## 11 Impact Estimation

If approvals in the Very High interest band reduce by 25%:

Portfolio default rate may decline by **1–2 percentage points**

Expected Benefits:

- Reduced credit loss
- Lower provisioning
- Improved ROA
- Better capital efficiency

## 12 Limitations

- No macroeconomic controls
- No predictive modeling
- Observational dataset
- Period-specific snapshot

## 13 Future Scope

- Build ML-based credit scoring model
- Estimate PD, LGD, EAD

- Integrate bureau data
- Automate risk monitoring dashboard

## 14 Conclusion

Interest Rate Band and Loan Amount are strong predictors of default concentration.

Structured KPI-driven segmentation enables:

- Smarter credit approvals
- Reduced exposure concentration
- Improved portfolio performance

## 15 Appendix

### **Interest Rate Band Formula:**

```
=IF(B2<0.08, "Low", IF(B2<=0.12, "Medium", IF(B2<=0.16, "High", "Very High")))
```

### **Loan Amount Band Formula:**

```
=IF(C2<=5000, "Low", IF(C2<=15000, "Medium", IF(C2<=30000, "High", "Very High")))
```

## Contribution Matrix

Team Member	Dataset & Sourcing	Cleaning	KPI & Analysis	Dashboard	Report Writing	PPT	Overall Role
Yashvi Goyal	Yes	Yes	Yes	Yes			
Nikith Gowda BS	Yes	Yes			Yes		
Shreya Narayani			Yes	Yes		Yes	
Trishit Swarnakar	Yes		Yes			Yes	
Dev Kothari			Yes	Yes			
Anshvardhan Badkur		Yes			Yes		
Vansh Jain	Yes			Yes			

**Declaration:** We confirm that the above contribution details are accurate and verifiable through version history and submitted artifacts.

**Team Signature Block:**

