CREDIT RISK ANALYSIS REPORT

By Vivian – Data Analyst | Power BI + DAX+ Excel

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1. What This Report Is About

This report looks into patterns that can help us understand which borrowers are more likely to default on loans.
Using **Power BI**, **DAX**, and **Excel**, I explored different borrower characteristics like income level, employment history, loan amount, purpose, and credit grade.
The goal is to **spot risks early**, make better lending decisions, and reduce financial losses.

About the Dataset

The dataset comes from **Kaggle** and includes over **33,000 loan applications**.
It contains borrower details, loan characteristics, and whether the loan was repaid or defaulted.

Key fields include:

- Age
- Income
- Loan Intent
- Loan Grade
- Employment Length
- Interest Rate
- Repayment Status

DATA DICTIONARY

Column Name	Description
person_age	Age of the loan applicant (in years).
person_income	Annual income of the applicant in USD.
person_home_ownership	Type of home ownership (e.g., RENT, OWN, MORTGAGE).

Column Name	Description
person_emp_length	Length of employment in years.
loan_intent	Purpose of the loan (e.g., EDUCATION, MEDICAL, PERSONAL).
loan_grade	Credit grade assigned to the loan (from A to G, where A is the highest).
loan_amnt	Total loan amount requested in USD.
loan_int_rate	Interest rate charged on the loan (as a percentage).
loan_status	Loan repayment status (1 = defaulted, 0 = fully paid).
loan_percent_income	Loan amount as a percentage of the applicant's income.
cb_persoNo_default_oNo_file	Indicates if applicant has previously defaulted on a loan (YES or NO).
cb_person_cred_hist_length	Length of the applicant's credit history in years.

KEY INSIGHT:

- **Loan Grade G** has the highest default rate, exceeding **20%**, indicating high-risk borrowers.
- **Lower income borrowers** (less than $20,000 annually) show a significantly higher tendency to default.
- **Borrowers with prior defaults** are nearly **twice as likely** to default again compared to those without.
- **Short employment history** (especially less than 2 years) is linked to higher default risk.
- **Larger loan amounts** and **higher interest rates** correlate with increased likelihood of default.
- **Loan purpose** like **debt consolidation, home improvement and medicals** affect default rates, showing consistently higher risks.

DATA PREPARATION

Source: credit_risk_dataset.csv from Kaggle.

Tool Used for Cleaning: Excel.

Cleaning Steps

- Filled missing loan_int_rate and person_emp_length with 0.
- Filtered out employment lengths over 12 years.
- Categorized income, loan size, and employment into bins.

Transformations:

- Created calculated columns**: income bracket, loan_size_category, default rate, total loans, avg interest rate, default status**.

KEY METRICS & KPIS

- Total Loans: **33,000**
- Defaulted Loans: **7,107**
- Default Rate (%): **21.81%**
- Average Interest Rate: **9.96%**

What I Discovered (Insights by Segment)

1. Loan Grade

- Loans graded A, B, and C had significantly fewer defaults
- Grade G loans had the highest default rate (over 20%), showing serious risk
  Chart: Default Rate by Loan Grade

2. Income Bracket

- Borrowers earning less than $20,000 annually had an **81.03%** default rate
- Those earning over $50,000 had only a **14.08%** default rate
  Chart: Default Rate by Income Level

3. Loan Size Category

- Very small loans tend to have lower risk
- Medium to large loans show a slightly higher chance of default
  Chart: Default Risk by Loan Size Category

4. Employment Length

- People with less than 2 years of job history are riskier
- Those with 6 to 12 years of employment are more stable
  Chart: Default Rate by Employment Length

5. Prior Defaults

- Applicants who have defaulted before are **nearly twice** as likely to default again
  Chart: Default Rate by Prior Defaults

CONCLUSION

Default risk isn't random — it's tied to **clear patterns**.
This analysis shows that borrowers with low credit grades, low income, short job history, and a record of past defaults are **much more likely to default again**.
Understanding these patterns allows lenders to **make smarter, more confident lending decisions**.

RECOMMENDATIONS

- Prioritize lending to borrowers with **higher credit grades** (A–C).
- Apply **stricter checks** for applicants with **low income** or **short job history**.
- Implement **risk-based interest rates** for borrowers with **larger loans** or **higher default probability**.
- Flag and further assess borrowers with a **history of defaults** before approval.