LOAN RISK AND PROFITABILITY

ANALYSIS

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EXECUTIVE SUMMARY - Project at a Glance

Analyzed loan portfolio data using SQL and BI dashboards to uncover patterns in lending, borrower risk, and profitability. The focus was on loan distribution by country and purpose, default rates by borrower profile, and financial performance by loan grade and term.

Key findings include:

- Profit: $37M on $436M disbursed and $474M received
- Top Region: Milan, followed by New York & Texas
- Loan Purpose: Debt Consolidation leads overall demand
- Risk by Term: 60-month loans → 22.34% default vs. 36-month → 10.71%
- Seasonality: December sees the highest loan issuance
- Loan Grade: Grade B is the most issued

DATA OVERVIEW

Dataset Size & Scope:
Analyzed 38,576 loan records with 27 features, covering borrower demographics, loan details, and repayment history.

Feature Engineering & Key Metrics:
Performed feature engineering to create actionable metrics such as Interest Paid, Loan-to-Income ratio, and Installment-to-Income ratio, along with numeric encoding of employment length and time-based features (Year, Month) for trend analysis.

Data Quality & Cleaning:
Handled missing values and ensured data consistency across categorical and numeric fields.

Tools & Techniques:
Used Python (Pandas, NumPy), SQL, and Power BI for data cleaning, analysis, feature engineering, and visualization.

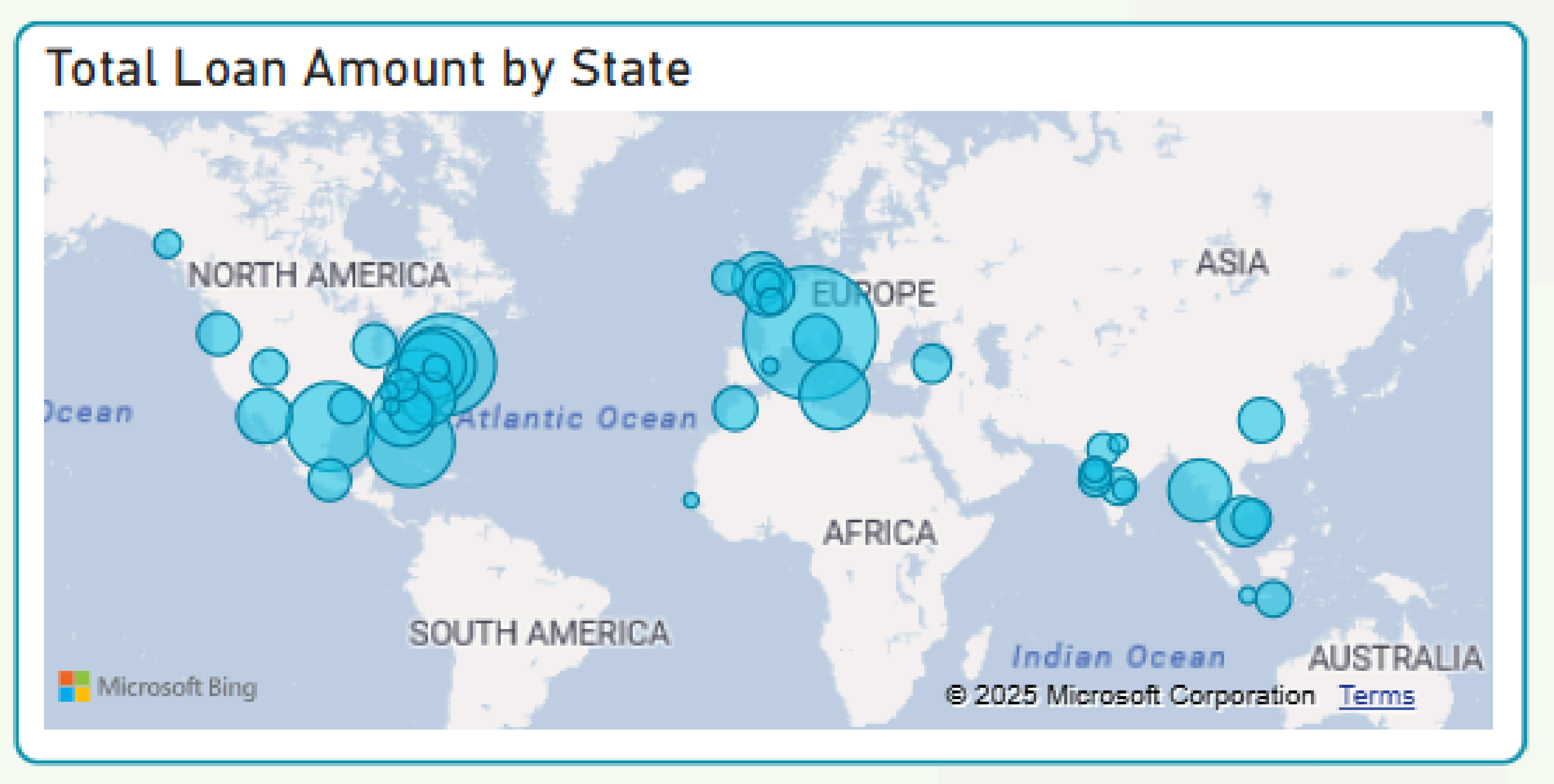
KEY FINANCIAL
Metrics

- **Positive Cash Flow**: The portfolio has a strong positive cash flow, with **$473 million** in payments received significantly exceeding the **$436 million** in total loans disbursed.
- **Profitability:** This positive flow has resulted in a total profit of **$37 million**, with the average loan amount being $11.30 thousand.
- **Profit Driver:** A healthy average interest rate of **12.05%** is the primary driver of this profit, demonstrating the portfolio is generating solid returns on its assets.

ANALYSIS AND FINDINGS

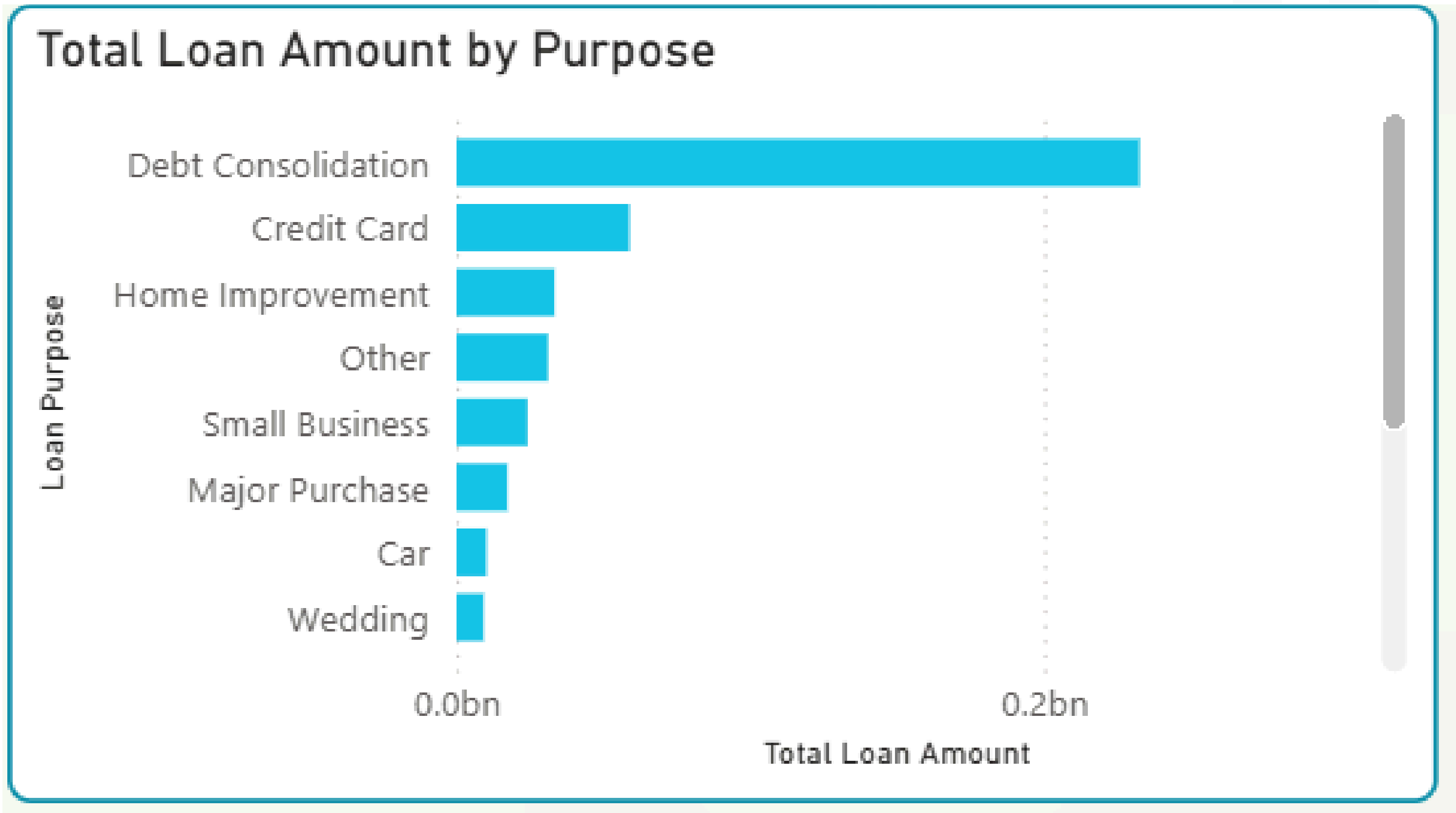
How are loans distributed across states?

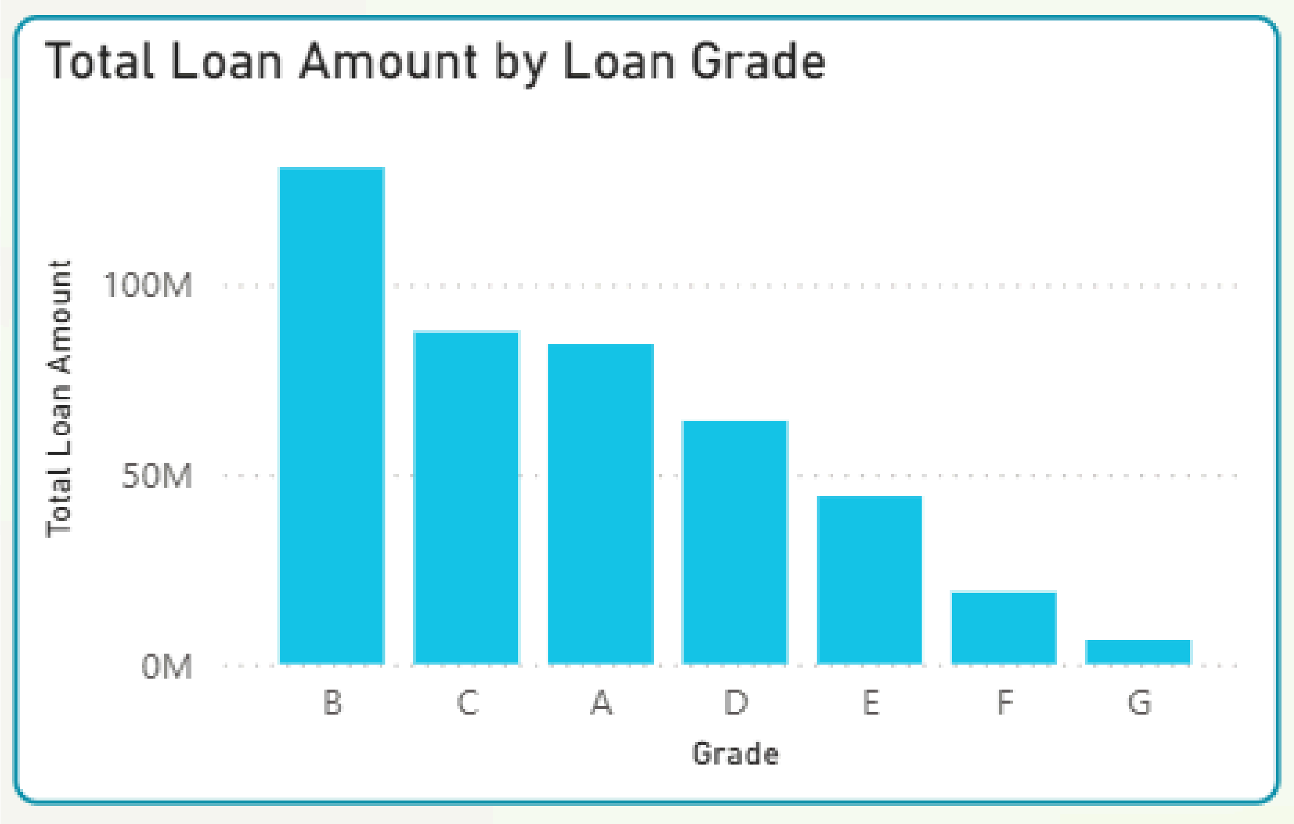
- The highest number of loans were issued in the Milan region, followed by New York and Texas, highlighting regional concentration and lending focus in these key markets.



How are loans distributed across grades and purposes?

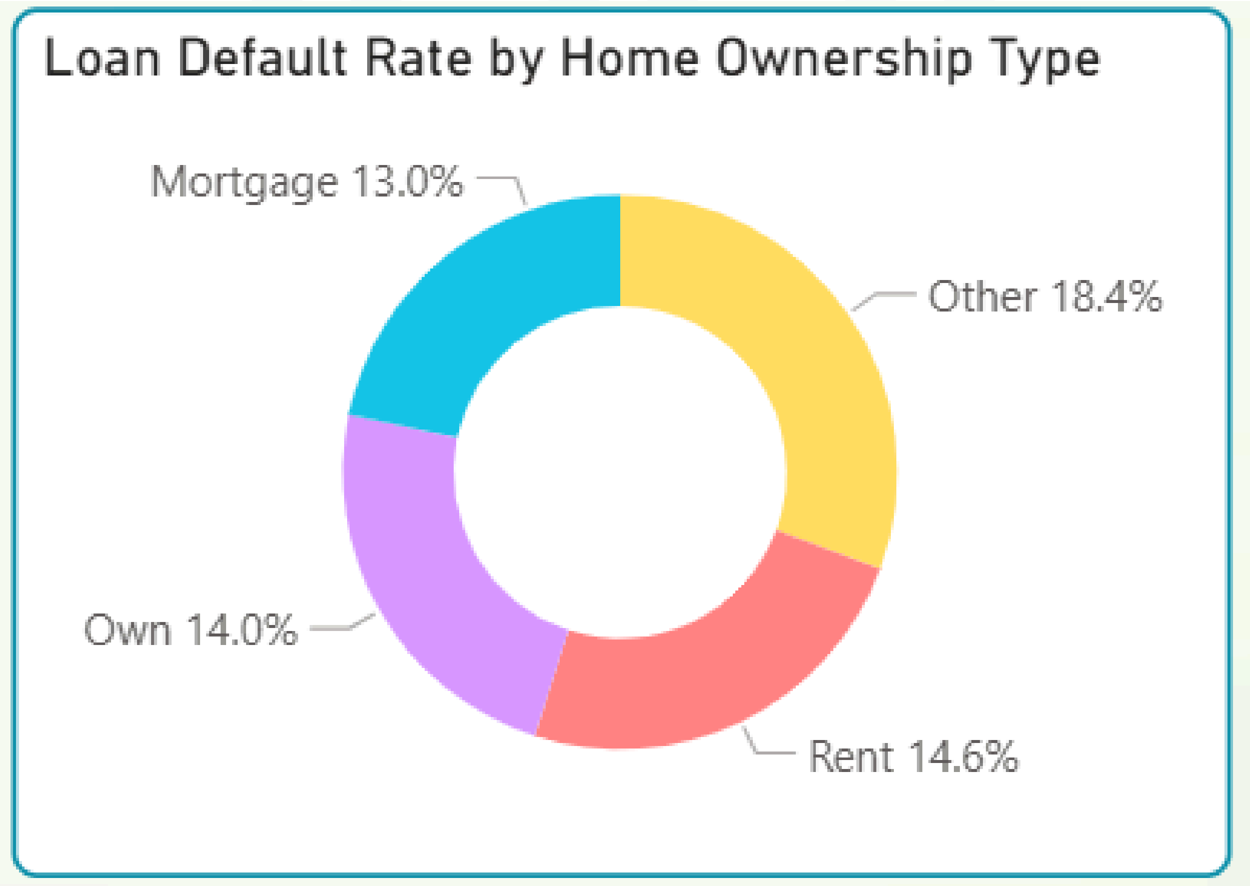
- **By Purpose: Debt consolidation is the dominant loan purpose, significantly higher than credit card loans, showing borrower preference for managing existing debt over other loan types.**
- **By Grade: Most loans were issued in grade B, followed by C and A, while grade G had the fewest loans. This shows lending is concentrated in lower-risk grades (A & B), with higher-risk grades (G) being issued cautiously.**





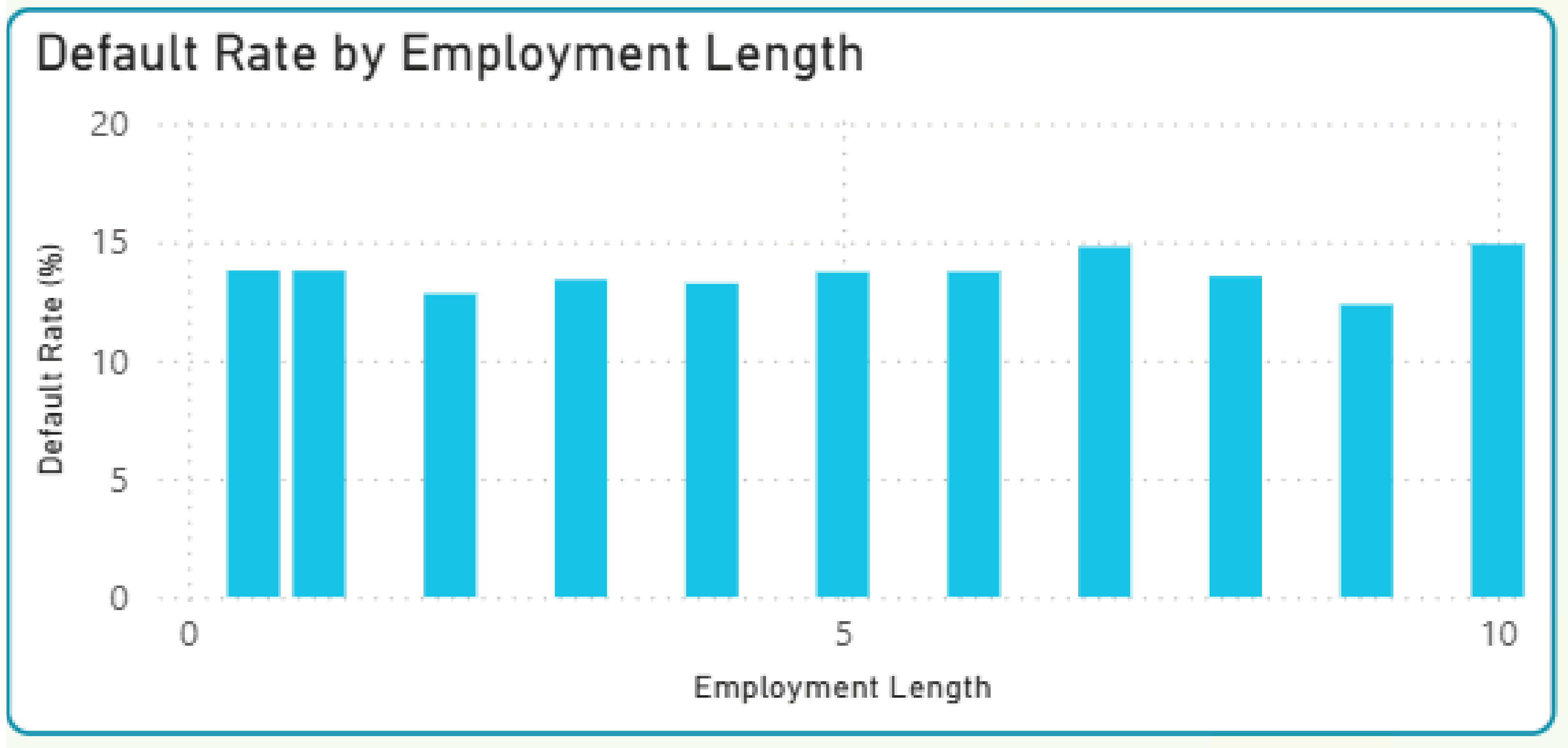
How does a borrower's homeownership status affect the default rate?

- **The data reveals a clear relationship between homeownership and default risk. The highest default rate is in the "Other" category at 18.4%, followed by those who rent at 14.6%. This indicates that these borrower segments pose a higher risk to the portfolio, which is a key factor to consider in future lending decisions.**



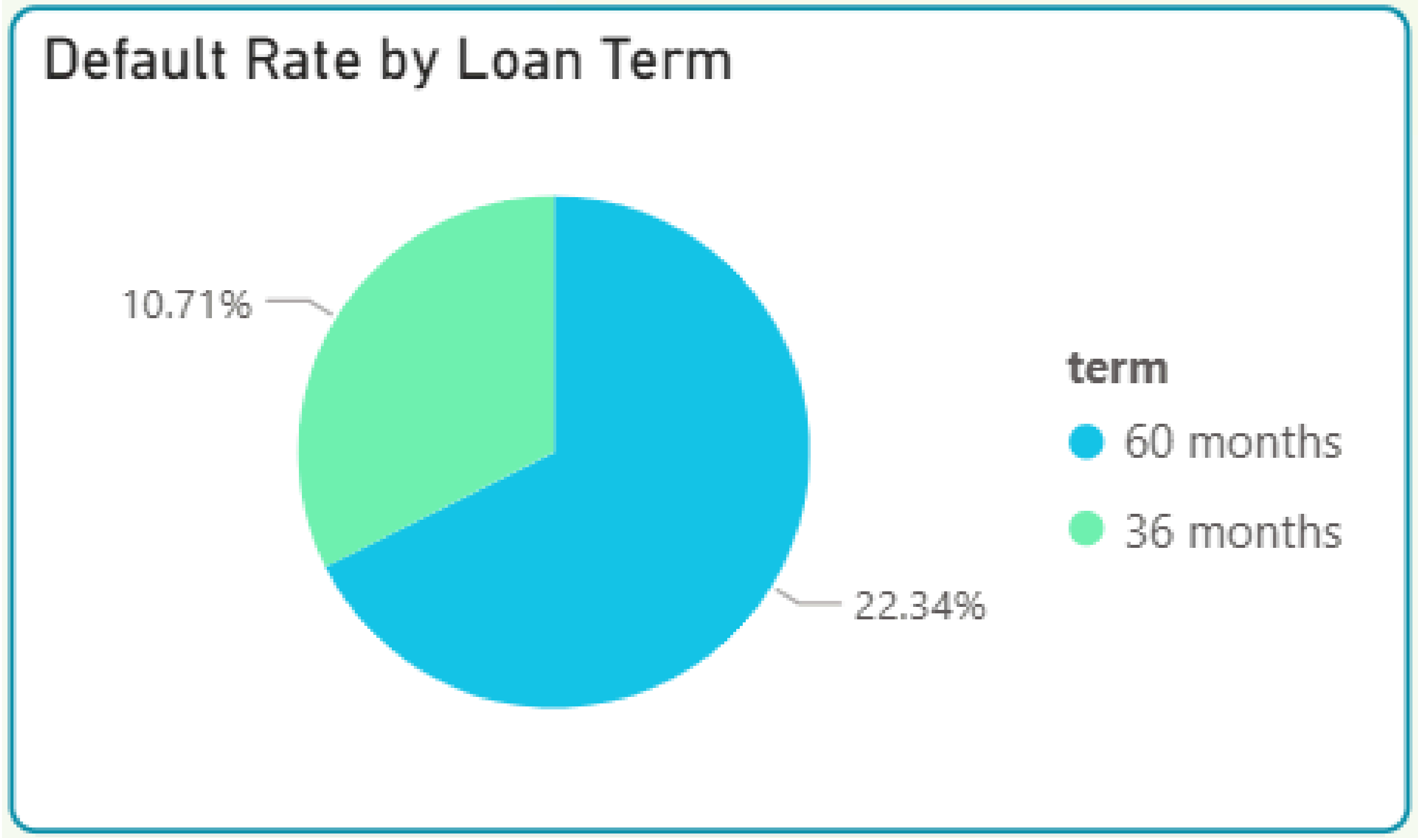
Does a borrower's employment length impact the default rate?

- **The data reveals that a borrower's employment length is not a key indicator of default risk. The default rates across all categories are uniform, consistently ranging from 13% to 15%. This suggests we should prioritize other factors for risk assessment.**



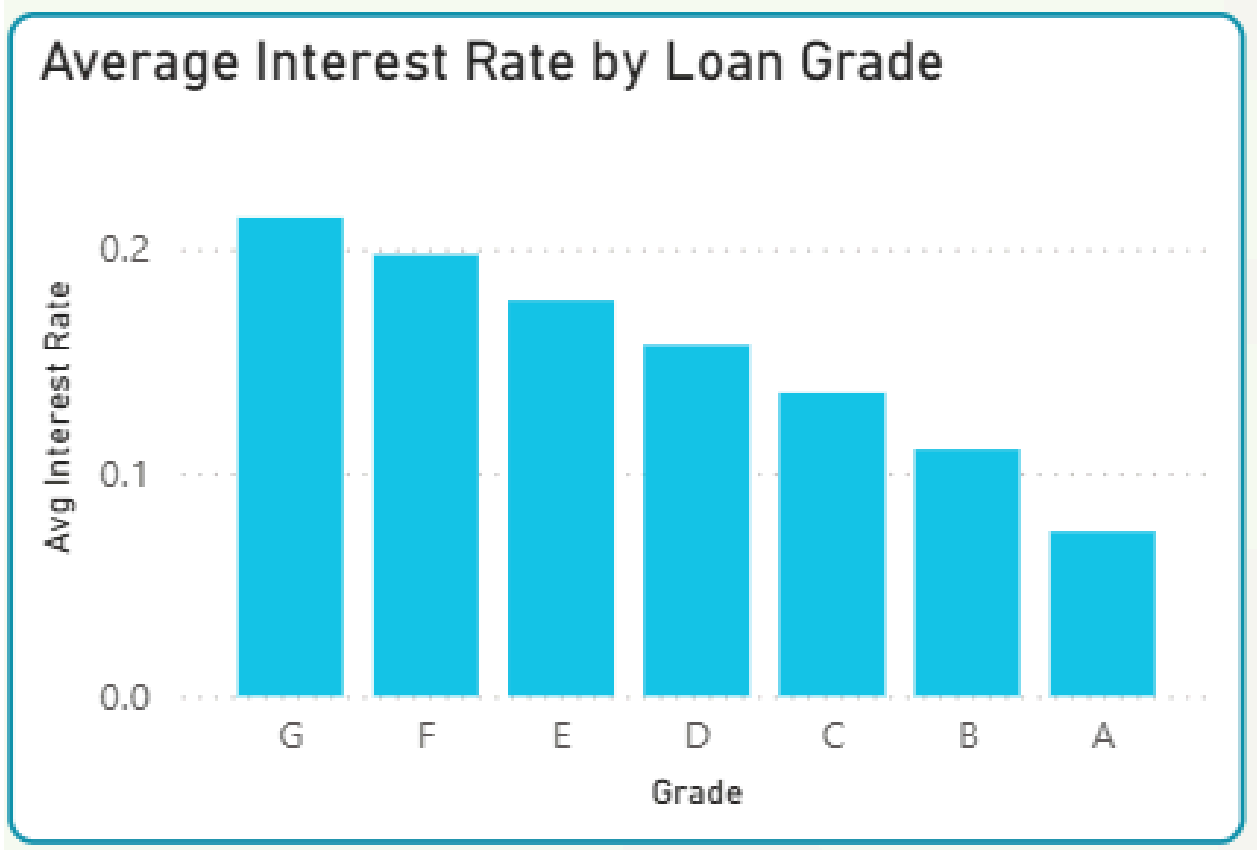
How does a loan's term affect its default rate?

- The data shows that loan term is a major indicator of default risk. The default rate for 36-month loans is 10.71%, while the rate for 60-month loans is 22.34%. This indicates that longer loan terms carry a substantially higher risk of non-payment.



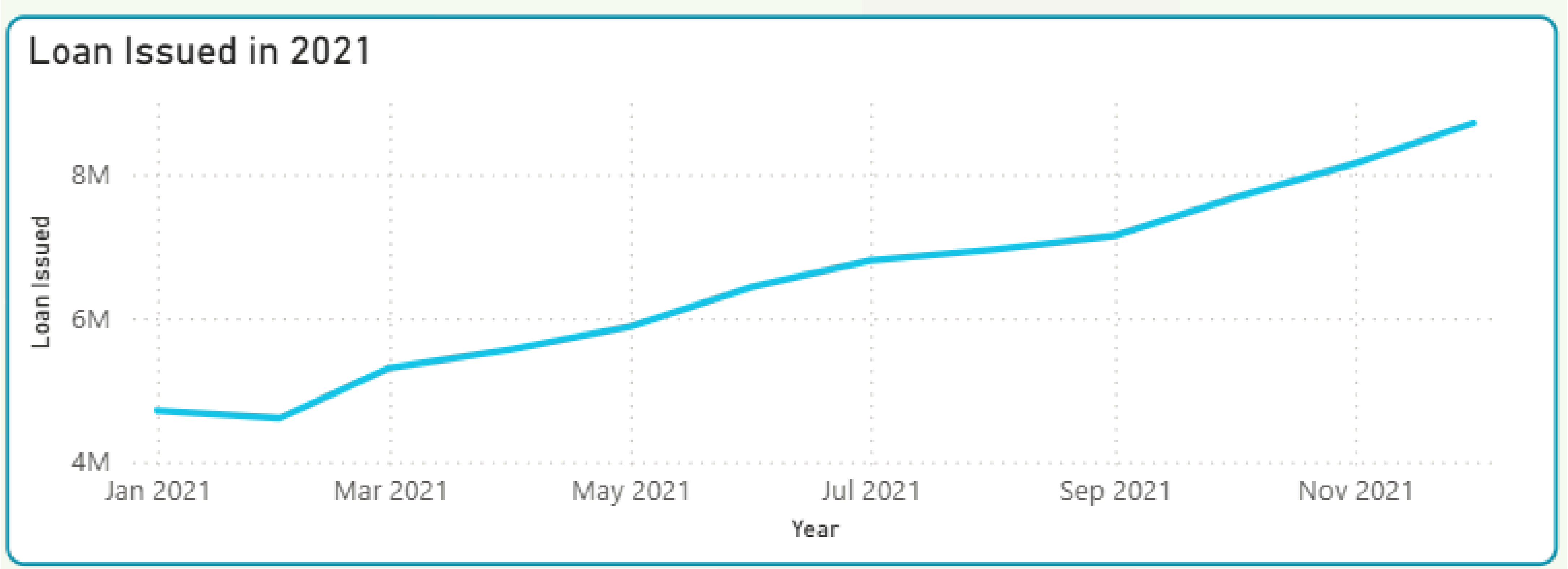
How does a loan's quality level affect its interest rate?

- The data confirms a fundamental principle of lending: risk dictates price. The riskiest loans (Grade G) are assigned a high average interest rate of 21% to protect the portfolio from potential losses. In stark contrast, the safest loans (Grade A) are priced at a much lower rate of just 7%. This strategic difference demonstrates that the company is effectively pricing risk to maximize profitability while controlling for potential defaults.



What is the trend of loans issued over time?

- The data shows a clear and positive trend of steady upward growth in loan issuance throughout 2021. The total amount of loans issued consistently increased over the course of the year, indicating a healthy and expanding portfolio.



RISK & RECOMMENDATION

The data shows that 60-month loans and borrowers who rent or are in the "Other" home status category are much more likely to default.

- **Recommendation: Adjust lending rules to be tougher on these high-risk groups. This will help reduce potential losses and protect the portfolio's profitability.**

Using a person's employment length to check for risk is not effective. The numbers show that people with long and short employment histories have similar default rates.

- **Recommendation: Stop using employment length as a main reason to approve or deny a loan, as the data proves this information is not helpful.**

The portfolio is growing very quickly, which can bring new and unexpected risks if not handled carefully.

- **Recommendation: Keep a close eye on this growth. Make sure risk checks are always up to date and can keep up with the increasing number of loans.**

Thank You!

Happy to connect!

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