PROJECT REPORT: Bank Loan Risk & Performance Analytics

Author: Dara Sum | Data Analyst
Date: January 20, 2026
Tools: SQL Server, Power BI, Excel
Domain: Fintech / Banking

---

1. Project Executive Summary

This project focuses on providing a comprehensive analysis of a bank's loan portfolio. By leveraging SQL for data extraction and Power BI for visualization, the goal was to transform raw loan data into actionable insights regarding lending performance, credit risk, and borrower behavior.

---

2. Problem Statement

The bank required a data-driven approach to monitor its lending health. Key requirements included:

- **KPI Tracking:** Real-time monitoring of applications, funded amounts, and repayments.
- **Risk Assessment:** Clearly distinguishing between "Good Loans" and "Bad Loans" to evaluate credit risk.
- **Trend Analysis:** Understanding seasonal patterns and geographic distributions of loans.
- **Operational Efficiency:** Providing a granular view of individual loan records for auditing purposes.

---

3. Domain Knowledge & Business Context

To ensure the analytics were meaningful, the project was grounded in the **Bank Loan Lifecycle**:

1. **Submission & Documentation:** Gathering borrower details and income stability.
2. **Credit Evaluation:** Analyzing DTI (Debt-to-Income) ratios and Credit Bureau scores.
3. **Risk Decisioning:** Assigning loan **Grades** and **Interest Rates** based on risk profiles.
4. **Monitoring:** Tracking the loan through its lifecycle (Fully Paid, Current, or Charged Off).

---

4. Data Understanding & Classification

The dataset contains **38,576** records with a total funded amount of **$435.8M**.

Loan Categorization:

- **Good Loans:** Status is either 'Fully Paid' or 'Current'.
- **Bad Loans:** Status is 'Charged Off' (Indicates default).

Key Metrics Defined:

- **MTD (Month-to-Date):** Performance for the current month (December 2021).
- **MoM (Month-over-Month):** Percentage change from the previous month (November).

---

5. Technical Execution: SQL Development

The data was processed using SQL Server to create views and validate metrics before visualization.

Key Query Logic:

- **Good Loan Percentage:**

  code SQL

  downloadcontent_copy

  expand_less

```
SELECT
    (COUNT(CASE WHEN loan_status = 'Fully Paid' OR loan_status =
'Current' THEN id END) * 100.0) /
    COUNT(id) AS Good_Loan_Percentage
FROM bank_loan_data;
```

- **MTD Total Funded Amount:**

  code SQL

  downloadcontent_copy

  expand_less

```
SELECT SUM(loan_amount) AS MTD_Total_Funded_Amount
FROM bank_loan_data
WHERE MONTH(issue_date) = 12 AND YEAR(issue_date) = 2021;
```

- **Monthly Trend Extraction:**

code SQL

downloadcontent_copy

expand_less

```
SELECT
    MONTH(issue_date) AS Month_Number,
    DATENAME(MONTH, issue_date) AS Month_Name,
    COUNT(id) AS Total_Loan_Applications
FROM bank_loan_data
GROUP BY MONTH(issue_date), DATENAME(MONTH, issue_date)
ORDER BY Month_Number;
```

---

6. Power BI Visualization Process

I developed a three-page interactive dashboard to serve different organizational levels:

Page 1: Executive Summary

- **Objective:** High-level health check for C-suite executives.
- **Key Visuals:** KPI Cards (MTD & MoM), Gauge Charts for Good vs. Bad Loan percentages, and a **Loan Status Grid** comparing Interest Rates vs. DTI.

Page 2: Portfolio Overview

- **Objective:** Tactical analysis of trends and distributions.
- **Key Visuals:**
    - **Line Chart:** Monthly Lending Trends (showing growth from $28M in Jan to $58M in Dec).
    - **Filled Map:** Regional analysis by State (identifying CA, NY, and TX as top markets).
    - **Donut Chart:** Loan Term distribution (36 months vs. 60 months).
    - **Bar Charts:** Analysis by Purpose (Debt Consolidation as the #1 driver) and Employment Length.

Page 3: Detailed View

- **Objective:** Operational tool for deep-diving into individual records.
- **Key Visuals:** A comprehensive table with dynamic filters (Grade, Purpose, State) to allow auditors to track specific loan IDs.

---

7. Key Insights & Findings

1. **Portfolio Quality:** The bank maintains a healthy portfolio with an **86.2% Good Loan rate**.
2. **Profitability vs. Risk:** "Charged Off" loans have a significantly higher average interest rate (**13.88%**) compared to "Fully Paid" loans (**11.64%**), confirming the risk-premium model.

3. **Growth Trend:** Loan applications show a steady upward trajectory throughout the year, with a **6.9% MoM increase** in the latest month.
4. **Dominant Segment:** Borrowers with **10+ years of employment** represent the highest funded segment ($126M), indicating a preference for stable, long-term employees.

---

8. Recommendations

- **Risk Mitigation:** Implement stricter DTI thresholds for "Small Business" loans, as this segment often carries higher volatility.
- **Marketing Focus:** Target states with low loan penetration but high economic growth using the Geographic Map insights.
- **Customer Retention:** Develop "Loyalty Refinancing" packages for the 32k+ "Fully Paid" borrowers to encourage repeat business.