Nguyen Thai Gia Nhi
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TABLE OF CONTENT

CHAPTER 1: DOMAIN KNOWLEDGE

I. Introduction to Bank Loans

A bank loan gives a person or business money now that must be paid back over time with interest. Loans can be secured or unsecured and are used for things like buying a home, a car, growing a business, or covering short-term cash needs (Bank Loan: Meaning, Types, Key Features, Eligibility and Example, 2018).

To evaluate borrowers and manage loans effectively, banks rely on multiple data sources. Using different types of data helps banks improve accuracy, reduce lending risk, and make better credit decisions. Common sources of loan data include:

- **Loan applications:** The application form is the first source, it holds identity, income, and documents the borrower submits (Bank Loan: Meaning, Types, Key Features, Eligibility and Example, 2018).
- **Credit information / credit bureaus:** Banks use credit-sharing and credit-bureau data (payment history, existing debts) to evaluate risk and lending terms. Credit-information sharing strongly shapes how banks judge borrowers (Álvarez-Botas and González, 2024).
- **Bank internal systems and online portals:** Transaction logs, repayment history, and customer data from the bank's systems and online portals are stored and used for monitoring (SeABank, 2025).
- **Third-party verification services:** Lenders may call employers, use income-verification services, or other external checks to confirm the documents and claims on the application (SeABank, 2025).

II. Loan Approval Process

According to SeABank (2025), below are the common steps banks take to approve a loan. Each step reduces uncertainty about repayment.

- **Apply:** Customer submits an application and supporting documents (ID, income papers).
- **Verify identity and documents:** The bank checks IDs and verifies submitted papers to prevent fraud.
- **Credit check:** Lenders pull credit data from bureaus and use credit-sharing information to assess credit history and score.
- **Income and employment check:** The bank confirms income (pay stubs, tax forms) and may contact the employer.
- **Collateral valuation (if applicable):** For secured loans, the pledged asset is appraised.
- **Risk review and decision:** The bank combines all data to accept or reject the loan and sets the amount, interest rate, and terms.
- **Agreement, disbursement and notification:** If approved, the borrower signs the contract, the bank disburses funds, and the bank notifies the applicant (approval notices, contract signing, or funding confirmation.

After funds are paid out, the borrower repays in scheduled installments. Banks monitor payment behaviour and update internal records; missed payments trigger collection steps or further review. Continuous monitoring helps the bank spot problems early.

III. Importance of Analysing Bank Loan Data

According to Banking Analytics: Top 10 Use Cases of Data Analytics in Banking (2023), banks analyse loan data to manage risk and run the business better. Key reasons include:

- **Risk assessment:** Data helps predict defaults and set interest rates or credit limits.
- **Better lending decisions:** Models and rules use borrower data to approve or decline applications faster and more consistently.
- **Portfolio management:** Analysis shows which loan groups underperform and need provisioning or repricing.
- **Fraud detection:** Data patterns that don’t fit expectations can indicate fraud or false documents.
- **Operational checks and compliance:** Data supports required reporting and helps banks meet rules and internal controls.

CHAPTER 2: TERMINOLOGIES IN DATA

This section explains the key variables in the Excel dataset used for bank loan analysis. Each field describes a specific aspect of the loan or the borrower and helps banks evaluate risk, performance, and repayment behavior. Below is a more detailed explanation of each variable and why banks use them reference to Lendingclub Function - RDocumentation (2018) and WPAB (2024).

N.o	Variables	Definitions	Why banks use them
1	Loan ID	A unique number assigned to each loan.	To track, manage, and reference individual loans across their entire lifecycle.
2	Address State	The state where the borrower lives.	To analyse regional loan patterns, manage geographic risk, and comply with local regulations.
3	Application Type	To link multiple loans to the same customer and track borrower behavior over time.	To assess shared repayment responsibility and adjust risk evaluation.
4	Employment Length	The number of years the borrower has been employed.	Longer employment usually indicates income stability and lower default risk.
5	Employment Title	The borrower’s job or position.	To understand income sources and assess financial capacity by occupation.
6	Grade	A credit risk grade assigned to the loan.	To price loans and manage risk. Higher grades usually mean lower risk and lower interest rates.
7	Home Ownership	The borrower’s housing status (e.g., rent, own, mortgage).	To assess financial stability and potential collateral strength.
8	Issue Date	The date the loan was issued.	To track loan age, interest accrual, and maturity timelines.
9	Last Credit Pull Date	The most recent date the borrower’s credit report was checked.	To ensure credit information is up to date when assessing risk.
10	Last Payment Date	The date of the most recent payment made by the borrower.	To evaluate payment behavior and identify potential delinquency.
11	Loan Status	The current condition of the loan (fully paid, charged off, current).	To monitor loan performance and classify loans for risk analysis.
12	Next Payment	The expected date of the next	To forecast cash flows and manage

	Date	loan payment.	liquidity planning.
13	Member ID	A unique identifier assigned to each borrower in the system.	A unique identifier assigned to each borrower in the system.
14	Loan Purpose	The reason the borrower took the loan (e.g., debt consolidation, education).	To segment borrowers and design loan products that match customer needs.
15	Subgrade	A more detailed risk level within each grade.	To further differentiate risk and set more accurate loan terms.
16	Term	The length of the loan, usually measured in months.	To structure repayment schedules and manage loan maturities.
17	Verification Status	Indicates whether the borrower's financial information has been verified.	To assess data reliability and reduce information risk.
18	Annual Income	The borrower's total yearly income.	To evaluate repayment ability and calculate affordability metrics.
19	Debt-to-Income Ratio (DTI)	The ratio of monthly debt payments to monthly income.	To measure how much debt a borrower can reasonably handle.
20	Instalment	The fixed monthly payment, including principal and interest.	To assess payment affordability and create amortization schedules.
21	Interest Rate	The annual percentage cost of borrowing.	To price loans, manage profitability, and reflect credit risk.
22	Loan Amount	The total amount borrowed by the customer.	To determine exposure size and manage portfolio risk.
23	Total Accounts	The total number of credit accounts the borrower currently has.	The total number of credit accounts the borrower currently has.
24	Total Payment	The total amount the borrower has paid on the loan so far.	The total amount the borrower has paid on the loan so far.

CHAPTER 3: DATA ANALYSIS

I. Dashboard 1: Summary

This dashboard provides a high-level view of the bank's financial health, growth momentum, and emerging risk trends.

1. Key Performance Indicators (KPIs) Requirements

Indicators	Total/Average (2021)	MTD (December, 2021)	MoM (December, 2021)
Total Loan Applications	38,576	4,314	+6.91%
Total Funded Amount	$435.76M	$53.98M	+13.04%
Total Amount Received	$473.07M	$58.07M	+15.9%
Average Interest Rate	12.05%	12.36%	+3.47% (relative)
Average DTI	13.33%	13.67%	+2.73% (relative)

In 2021, the bank transitioned from stable growth to rapid expansion. Loan applications remained relatively steady from January to May (around 2,200-2,500 per month), then increased consistently from June onward, peaking at year-end. This pattern signals a deliberate shift toward more aggressive portfolio growth rather than short-term volatility.

Loan disbursement accelerated even faster than application growth, especially in December. Total funded amount rose from approximately $25M in January to $54M in December, making it the fastest-growing KPI. This reflects both higher loan volumes and increased capital deployment per loan.

Despite rapid expansion, liquidity remained strong. Total cash received reached $473M, exceeding the total funded amount ($436M). This confirms effective capital recovery and indicates that growth was supported by cash flow rather than financed at the expense of liquidity.

Average interest rates trended upward throughout the year, increasing from 11.4% to 12.3%. This reflects a gradual tightening of pricing policy and improved yield. However, higher rates also increase borrower repayment pressure, which may translate into higher credit risk if not carefully managed.

Average DTI rose slightly toward year-end but remains around 13-14%, well below the 36% safety threshold. Borrower leverage is therefore still manageable. That said, a continued upward trend toward 15% would justify tighter underwriting standards to protect asset quality as the portfolio scales.

2. Good Loan vs Bad Loan KPI's

Loan Category	Total Loan Applications	Total Funded Amount	Total Amount Received
Good Loan	33243 (86.18%)	$370.22M	$435.79M
Bad Loan	5333 (13.82%)	$65.33M	$37.28M

Good loans (fully paid and current) account for 86.18% of applications, around 85% of funded amount, and over 92% of total cash received. Cash recovered from good loans alone ($435.8M) already exceeds the total funded amount of the entire portfolio, meaning the bank has effectively broken even and moved into true profitability.

In contrast, bad loans (charged off) represent 13.82% of applications, which is materially higher than the typical banking benchmark of 5-7%. For this segment, the bank disbursed $65.5M but recovered only $37.3M, implying an approximate 43% loss on charged-off loans. This confirms that higher interest rates on risky borrowers do not sufficiently compensate for credit losses.

3. Loan Status Grid View

Loan Status	Total Loan Applications	Total Funded Amount	MTD Funded Amount	Total Amount Received	MTD Amount Received	Average Interest Rate	Average DTI
Charged Off	5333	$65.53M	$8.73M	$37.28M	$5.32M	13.88%	14.00%
Current	1098	$18.87M	$3.95M	$24.2M	$4.93M	15.10%	14.72%
Fully Paid	32145	$351.36M	$41.3M	$411.59M	$47.82M	11.64%	13.17%

Fully paid loans are the foundation of the portfolio, with 32,145 applications and $351.36M funded. Cash recovery is strong at $411.59M, exceeding disbursements and confirming solid profitability and liquidity. Month-to-date performance remains healthy, while the lower average interest rate (11.64%) and moderate DTI (13.17%) reflect high borrower quality. This segment should be treated as the benchmark for underwriting standards.

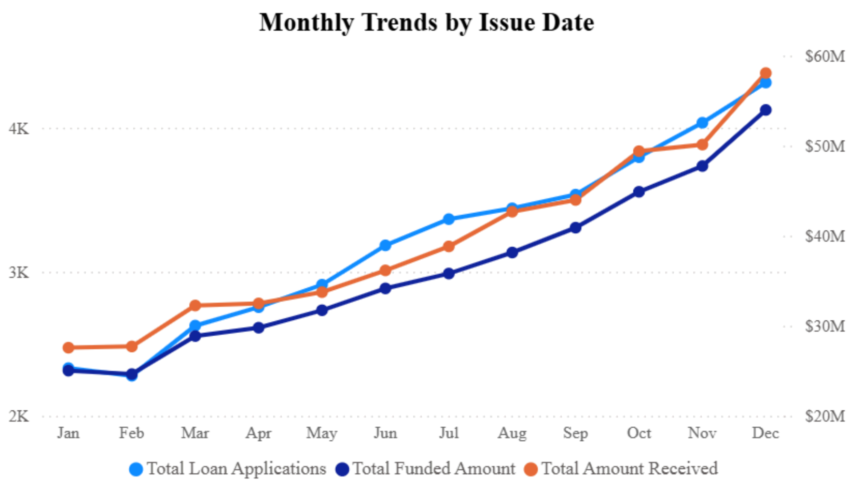
Charged off loans are the main source of losses. The bank funded $65.53M but recovered only $37.28M, implying a around 43% loss. Despite a higher average interest rate (13.88%), repayment performance is weak, and the higher DTI (14.00%) signals elevated borrower risk. Pricing alone is insufficient to offset credit losses in this group.

Current loans form a smaller but risk-sensitive segment. With $18.87M funded and $24.20M received, performance is positive for now, but the highest interest rate (15.10%) and highest DTI (14.72%) indicate potential downside risk if conditions worsen.

II. Dashboard 2: Overview

This dashboard answers two core questions: who is borrowing, and for what purpose.

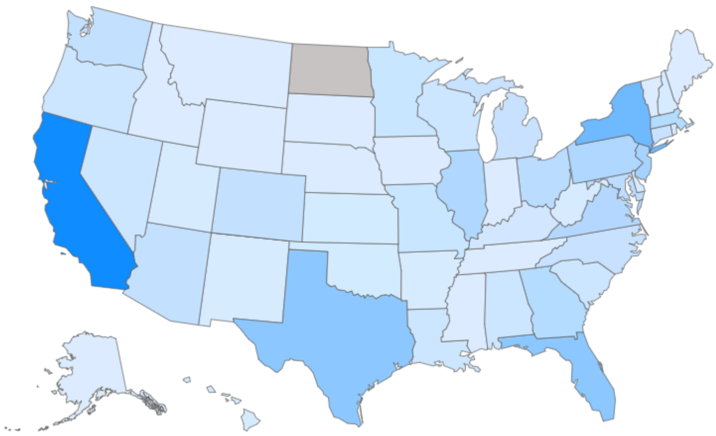
1. Monthly Trends by Issue Date



Over the 12-month period, the bank followed an ambitious yet well-controlled growth trajectory. Loan applications nearly doubled, rising from 2,332 to 4,314, reflecting strong and consistent demand. At the same time, the total amount received exceeded the total funded amount every month, indicating healthy cash circulation. The bank successfully scaled disbursements, up 13% in the final month, while maintaining strong capital recovery, enabling continuous reinvestment.

2. Regional Analysis by State

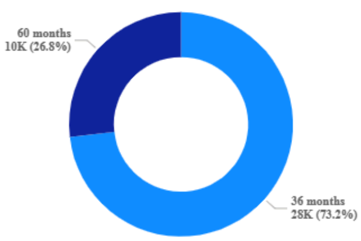
Regional Analysis by State



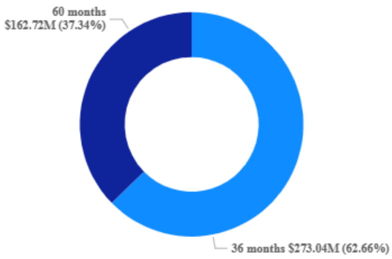
Loan activity is highly concentrated in large economic states. California is the dominant market, accounting for 17.8% of total applications (6,894 out of 38,576). Other key states such as New York and Texas also show strong lending volumes, with cash collections exceeding funded principal. While this concentration supports scale efficiency, it also exposes the portfolio to regional risk, as economic shocks in California could affect nearly 20% of overall performance.

3. Loan Term Analysis

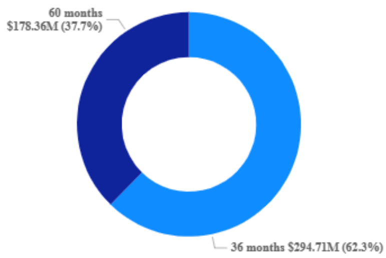
Total Loan Applications



Total Funded Amount

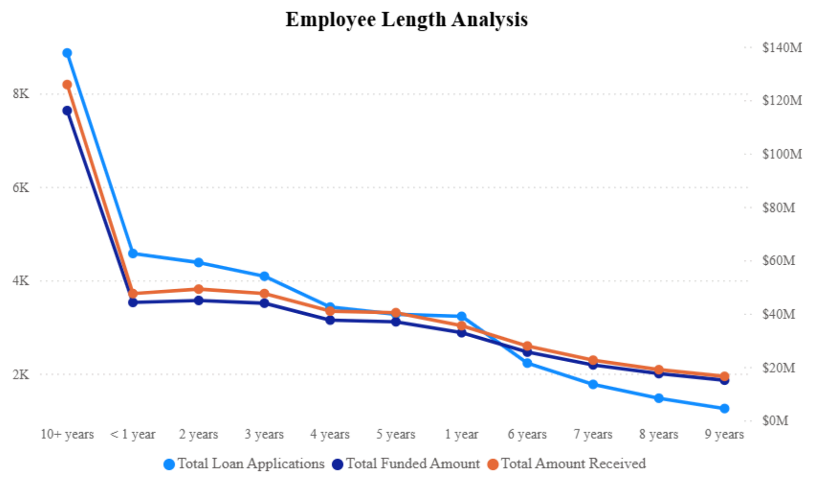


Total Amount Received



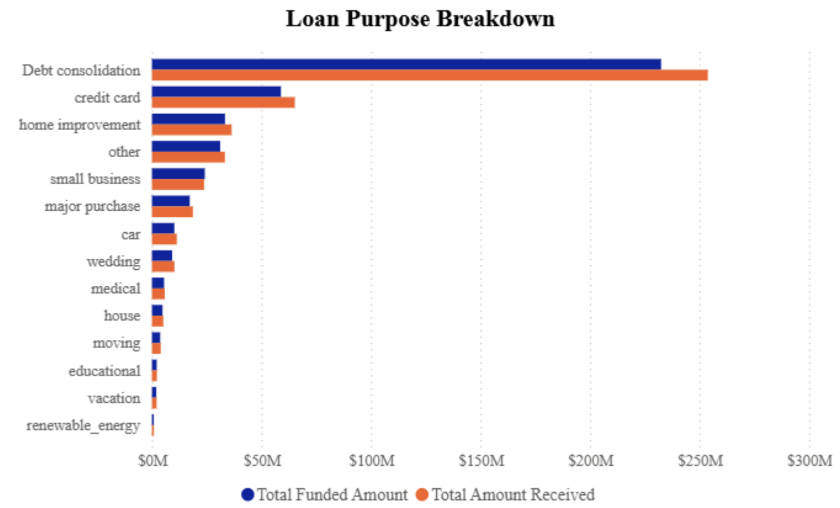
The portfolio is anchored by 36-month loans, which account for 73% of total applications. This segment delivers fast capital turnover and stable cash flow (around $294.7M received and $273M funded). In contrast, 60-month loans are fewer in number but carry a much higher average loan size (around $15.7k received and $9.6k funded). This structure shows a clear strategy: 36-month loans drive liquidity, while 60-month loans enhance profitability per customer.

4. Employee Length Analysis



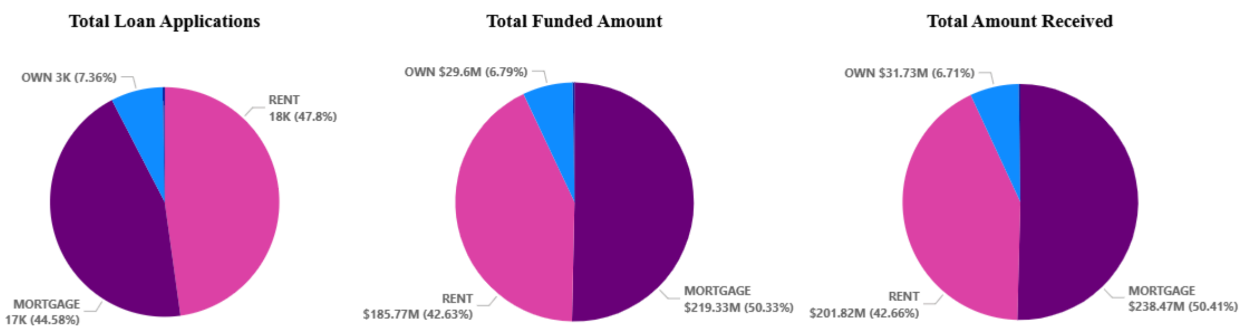
Borrowers with 10+ years of employment form the most reliable segment, with 8,870 loans and $116.1M funded. Underwriting clearly favors long-tenure borrowers, who provide more predictable repayment behavior and act as a stability anchor for the overall portfolio.

5. Loan Purpose Breakdown



Debt consolidation is the dominant loan purpose, with 18,214 loans and $232M funded, representing over 50% of total deployed capital. Demand is primarily driven by borrowers restructuring existing debt. While this presents a major growth opportunity, it also introduces cyclical risk if rising interest rates weaken repayment capacity.

6. Home Ownership Analysis



Borrowers with a mortgage generate the highest total funded amount ($219.3M) despite having fewer applications than renters. This indicates higher credit limits and larger ticket sizes for property-backed profiles. In contrast, renter loans are smaller and more granular, helping contain potential loss severity.

III. Dashboard 3: Details

Diving deeper into loan-level details, several risks emerge that are not fully visible in aggregate dashboards. Portfolio profitability is highly concentrated. Fully paid loans generate cash inflows that more than offset losses from charged-off loans, meaning overall profitability depends heavily on a single high-quality segment. Charged-off loans recover only a portion of funded capital, confirming that losses are structural rather than temporary.

In addition, risk compounds at the borrower level. Individually, DTI, interest rate, and employment length remain within acceptable ranges, but when combined, these factors significantly weaken repayment performance. In addition, a large portion of recently issued loans has not yet been stress-tested through a full credit cycle, meaning current portfolio health may slightly overstate long-term resilience.

Finally, a significant portion of recently issued loans has not yet completed a full credit cycle, suggesting that current portfolio health reflects realized performance rather than fully tested risk.

CHAPTER 4: CONCLUSION AND RECOMMENDATION

The analysis confirms that the bank achieved strong and well-controlled growth in 2021. Loan volumes and disbursements expanded rapidly, while liquidity remained healthy, as total cash received consistently exceeded total funded amounts. The portfolio has moved beyond break-even, indicating that growth has been supported by effective capital recovery rather than increased risk-taking.

However, profitability is highly concentrated. Fully paid loans form the core of portfolio performance and generate cash flows that offset structural losses from charged-off loans. Higher interest rates on riskier borrowers do not compensate for credit losses, and portfolio stability therefore depends on maintaining the quality of a relatively narrow borrower segment. Loan-level analysis also shows that risk compounds when higher DTI, elevated pricing, and weaker employment profiles coexist within the same loan.

To sustain performance as the portfolio scales, underwriting standards observed in fully paid loans should be treated as benchmarks (Federal Deposit Insurance Corporation, n.d.), and reliance on interest-rate-based risk pricing should be reduced in favor of stricter borrower screening (United States government, 2016). Growth should remain focused on shorter-term loans that provide faster capital turnover and better visibility into repayment behavior (Hayes, 2024). Finally, recent loan vintages should be closely monitored, as a significant portion of new loans has not yet been tested through a full credit cycle and may pose latent risk (Bhalla, n.d.).

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