



TDI BANK LOAN ANALYSIS

← BY VICTORIA JAJA →

INTRODUCTION



The Data Immersed (TDI) company is a financial service company that offers Individual loans to borrowers for different loan purposes.

Microsoft Excel will be used as the tool for this analysis to help TDI gain valuable insights for enhancing its loan approval process, lower default rates, and boost profitability.

Analyzing the customer's dataset will then be used to make data-driven decisions about its loan performance for customer satisfaction and maximizing profit.

PROBLEM STATEMENT



The Loan Data Analysis aims to address the challenges faced by TDI in managing loan portfolios.

TDI has provided a dataset with customer details and seeks to gain insights on how to improve its loan management, by finding out what makes borrowers risky, understanding why there are many loan defaults, and figuring out the best interest rates for different types of customers.

OBJECTIVES



The main objective of this analysis is to enhance the loan approval process by identifying key factors to reduce defaults and make better decisions.

The analysis also focuses on increasing profitability by determining optimal interest rates for different customer groups and understanding the impact of loan amounts based on their specific needs and purposes. Additionally, it examines regional trends to identify areas with varying borrowing rates and loan performance.

RECOMMENDATION



- Offer small amounts to low-income borrowers and vice versa to reduce default and boost profit.
- Offer flexible repayment options to high-risk borrowers, to reduce default.
- Tighten approval criteria for large loans.
- Offer financial education to improve financial stability.
- Set a minimum credit score of 40.
- Implement stricter verification processes by adjusting the loan approval strategy.
- Reduce interest rates for risky loans.
- Set a threshold on the loan amount for all borrowers relative to their income before approving a new loan.
- Suggest safer loans with collateral to borrowers to minimize potential defaults.
- Take advantage of the loan spike strategy to boost profitability.
- Targeted marketing strategies can contribute to an increase in demand for slower month periods.

DATA CLEANING



Before analyzing this dataset, some data-cleaning steps were taken, and they include:

Data Transformation: The dataset was downloaded as a zipped file, extracted, and converted to an Excel file for further analysis.

Removing empty rows: Two empty rows were identified and deleted by highlighting them and using the delete option.

Checking for duplicates: Duplicates in the Member ID column were highlighted using Conditional Formatting, and 15 duplicates were removed using the Remove Duplicates feature.

Removing unwanted columns: Irrelevant columns such as Customer ID, Loan Application Type, and Sub-grade were deleted, along with the incorrectly computed original DTI Ratio column.

Classifying the Job Length Column to levels: The Job Length column was cleaned with the TRIM function to remove extra spaces.

Classifying the Customer Address column: The IF function was used to classify the customer address column to their descriptive names in states.

DATA CLEANING



Handling missing values: Empty cells in the Job Title column were replaced with "Others," and functions were applied to standardize case and trim spaces

Categorizing the Risk Level Column: The risk levels were labeled descriptively from Critical to Low Risk using the IFS function and pasted back into the original dataset.

Classifying Homeownership Status: The homeownership status was categorized to Mortgage, Own, Rent, using the IF function after cleaning spaces with the TRIM function

Renaming columns to meaningful names: Descriptive names were assigned to each column to enhance clarity

Converting Data Types: Date fields were verified and converted to the correct format using the Text to Columns option and formatted accordingly

Removing spaces between characters: The TRIM function was applied to the Loan Status and Loan Purpose columns, and the Proper function standardized the text case

Classifying Loan Verification Status: The Loan Verification Status was categorized using the IF function after removing spaces with the TRIM function

DATA CLEANING



Checking for blank cells: Blank cells in the Annual Income, Total Payment, and Loan Amount columns were filled with the average value, using the Find and Replace function.

Using the decrease decimal option: The DTI Ratio, Loan Installment, Interest Rate, and Loan Amount columns were reduced to two decimal places, and extra spaces were checked but none were found.

Grouping columns: The Total Credit Account column was grouped into categories using the IF function, for consistency.

Currency format: All amount or payment columns were changed to currency format

Performing Calculated Columns for Further Analysis: Monthly Income was calculated by dividing Annual Income by 12, and the DTI ratio was computed to assess borrowing capacity.

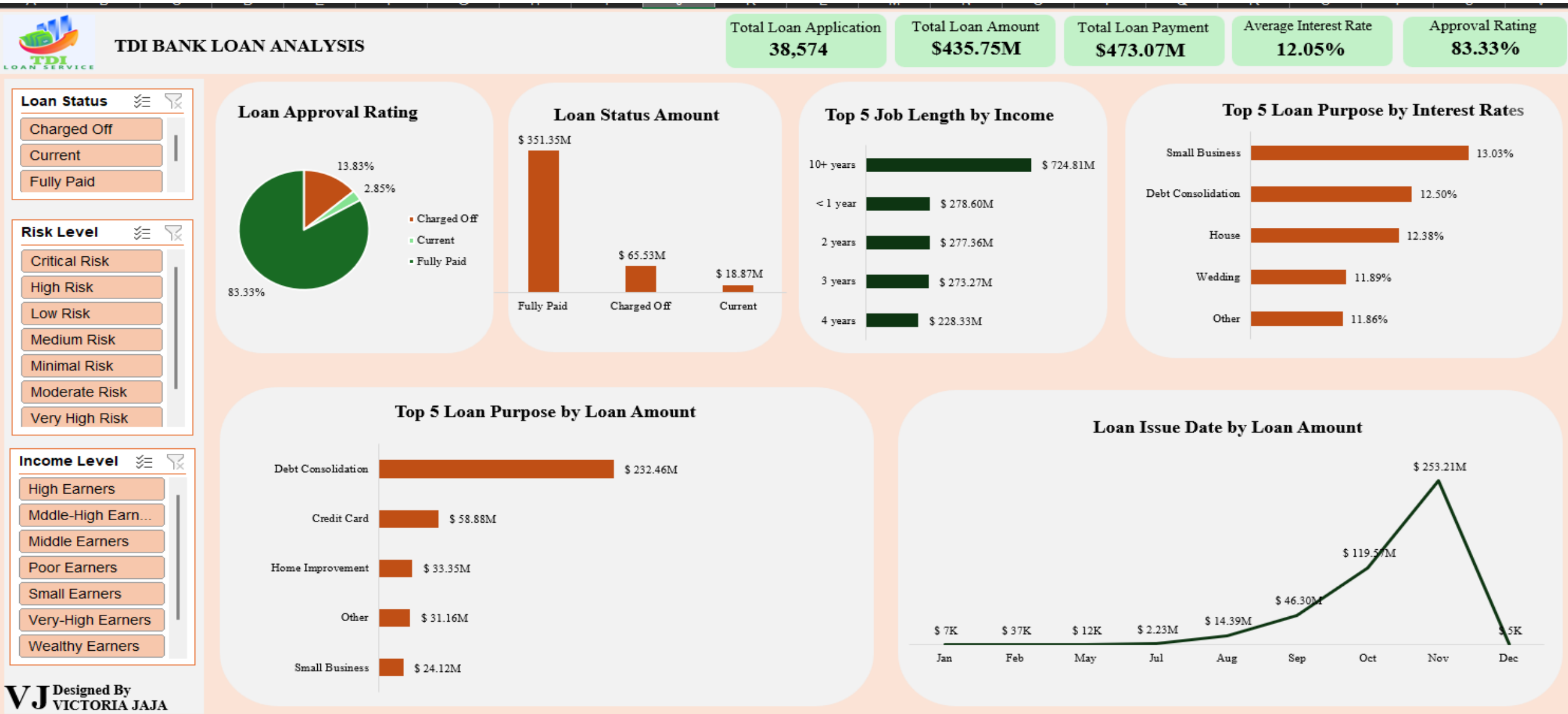
Highlighting Missing Data: The calculation of the LTV ratio was not completed due to missing appraisal values, as the specific location data required was not available.

DATASET PREVIEW

id	address_state	application_type	emp_leng	emp_title	gr	home_ownership	issue_date	last_credit_pull_date	last_payment_date	loan_status	next
1077430	GA	INDIVIDUAL	< 1 year	Ryder	C	R	11/2/2021	13-09-2021	13-04-2021	Charged Off	13-08
1072053	CA	INDIVIDUAL	9 years	MKC Accounting	E	R	1/1/2021	14-12-2021	15-01-2021	Fully Paid	15-02
1069243	CA	INDIVIDUAL	4 years	Chemat Technology Inc	C	R	5/1/2021	12/12/2021	9/1/2021	Charged Off	
1041756	TX	INDIVIDUAL	< 1 year	barnes distribution	B	MO	25-02-2021	12/12/2021	12/3/2021	Fully Paid	
1068350	IL	INDIVIDUAL	10+ years	J&J Steel Inc	A	MO	1/1/2021	14-12-2021	15-01-2021	Fully Paid	15-02
1062608	CA	INDIVIDUAL	3 years	Studio 94 Corp	C	R	17-07-2021	16-03-2021	12/8/2021	Fully Paid	
1067441	TX	INDIVIDUAL	10+ years	American Airlines	C	MO	19-11-2021	14-06-2021	13-12-2021	Fully Paid	13-01
1066424	PA	INDIVIDUAL	10+ years	SCI Mahanoy	A	O	11/6/2021	14-07-2021	14-07-2021	Fully Paid	14-08
1065254	FL	INDIVIDUAL	10+ years	Tech Data Corp	A	MO	2/9/2021	15-06-2021	12/10/2021	Charged Off	
1064589	MI	INDIVIDUAL	10+ years	tellow contracting	B	MO	9/2/2021	16-03-2021	16-03-2021	Fully Paid	16-04
1057766	TX	INDIVIDUAL	10+ years	Ericsson	B	MO	22-07-2021	13-09-2021	13-08-2021	Fully Paid	13-08
1062734	CA	INDIVIDUAL	3 years	myrvpartsplace.com	B	R	11/9/2021	13-03-2021	12/10/2021	Charged Off	
1020855	CA	INDIVIDUAL	5 years	henkel corporation	B	R	11/12/2021	14-12-2021	14-12-2021	Fully Paid	14-01
1060945	IL	INDIVIDUAL	4 years	AXA Assistance	B	R	11/10/2021	14-12-2021	14-12-2021	Fully Paid	14-01
1060995	RI	INDIVIDUAL	< 1 year	HSA-UWC	B	R	11/12/2021	14-02-2021	13-10-2021	Charged Off	13-11
1046507	TX	INDIVIDUAL	1 year	Child's Day	B	R	2/12/2021	16-04-2021	14-12-2021	Fully Paid	14-01
1059936	NY	INDIVIDUAL	4 years	OEC Freight	C	R	9/10/2021	15-09-2021	12/11/2021	Fully Paid	
1059497	FL	INDIVIDUAL	10+ years	Sandestin Beach Hilton	B	MO	12/12/2021	14-12-2021	14-12-2021	Fully Paid	14-01
1058060	MD	INDIVIDUAL	10+ years		D	O	2/2/2021	16-05-2021	15-02-2021	Fully Paid	15-03
112245	WI	INDIVIDUAL	6 years	Norman G. Olson Insurance	A	R	7/7/2021	16-04-2021	10/8/2021	Fully Paid	
207910	FL	INDIVIDUAL	< 1 year		A	MO	8/1/2021	16-05-2021	10/2/2021	Charged Off	
1068350	IL	INDIVIDUAL	10+ years	J&J Steel Inc	A	MO	1/1/2021	14-12-2021	15-01-2021	Fully Paid	15-02
1062608	CA	INDIVIDUAL	3 years	Studio 94 Corp	C	R	17-07-2021	16-03-2021	12/8/2021	Fully Paid	
1067441	TX	INDIVIDUAL	10+ years	American Airlines	C	MO	19-11-2021	14-06-2021	13-12-2021	Fully Paid	13-01
1066424	PA	INDIVIDUAL	10+ years	SCI Mahanoy	A	O	11/6/2021	14-07-2021	14-07-2021	Fully Paid	14-08
1065254	FL	INDIVIDUAL	10+ years	Tech Data Corp	A	MO	2/9/2021	15-06-2021	12/10/2021	Charged Off	
65426	MI	INDIVIDUAL	< 1 year	Infotrieve, Inc.	B	MO	9/8/2021	16-05-2021	11/6/2021	Charged Off	
211723	MD	INDIVIDUAL	4 years	self employed	C	O	8/1/2021	9/12/2021	8/8/2021	Charged Off	
662350	NV	INDIVIDUAL	10+ years	Clark County School District	A	MO	11/1/2021	13-02-2021	12/8/2021	Charged Off	
1006769	PA	INDIVIDUAL	6 years	The Mount Sinai School of Medicine	A	MO	11/11/2021	13-11-2021	13-06-2021	Charged Off	13-07
405986	GA	INDIVIDUAL	< 1 year	Blue Ridge Design Group	A	MO	9/6/2021	16-05-2021	9/12/2021	Charged Off	
445846	MI	INDIVIDUAL	10+ years	Abbott Nutrition	A	MO	9/10/2021	16-05-2021	12/2/2021	Charged Off	
659221	MI	INDIVIDUAL	3 years	rice &werthmann	A	MO	11/1/2021	16-05-2021	13-10-2021	Charged Off	13-11
782425	UT	INDIVIDUAL	6 years	Five County Assoc of Governments	A	MO	11/6/2021	16-05-2021	12/7/2021	Charged Off	
458328	GA	INDIVIDUAL	< 1 year	north ga dentention center	B	MO	10/1/2021	10/11/2021	10/7/2021	Charged Off	
744344	WA	INDIVIDUAL	6 years		B	MO	11/5/2021	16-05-2021	13-01-2021	Charged Off	13-02
1026463	FL	INDIVIDUAL	6 years	sky powersports	C	MO	11/11/2021	14-04-2021	13-12-2021	Charged Off	13-01
489679	FL	INDIVIDUAL	2 years	Synovus Bank	D	MO	10/3/2021	12/12/2021	12/7/2021	Charged Off	
519658	GA	INDIVIDUAL	< 1 year	ACUMEN FISCAL AGENT/MS ROBINSON	A	O	10/5/2021	12/1/2021	11/8/2021	Charged Off	

Job Length	Customers Address	Job Title	Risk Level	Home Ownership Status	Loan Issue Date	Last Credit Pull Date	Last Payment Date	Loan Status	Next Payment Date	Member ID
< 1 year	Georgia	Ryder	Moderate Risk	Rent	11/02/21	09/13/21	04/13/21	Charged Off	05/13/21	1314167
9 years	California	Mkc Accounting	High Risk	Rent	01/01/21	12/14/21	01/15/21	Fully Paid	02/15/21	1288686
4 years	California	Chemat Technology Inc	Moderate Risk	Rent	05/01/21	12/12/21	01/09/21	Charged Off	02/09/21	1304116
< 1 year	Texas	Barnes Distribution	Low Risk	Mortgage	02/25/21	12/12/21	03/12/21	Fully Paid	04/12/21	1273024
10+ years	Illinois	J&J Steel Inc	Minimal Risk	Mortgage	01/01/21	12/14/21	01/15/21	Fully Paid	02/15/21	1302971
3 years	California	Studio 94 Corp	Moderate Risk	Rent	07/17/21	03/16/21	08/12/21	Fully Paid	09/12/21	1294481
10+ years	Texas	American Airlines	Moderate Risk	Mortgage	11/19/21	06/14/21	12/13/21	Fully Paid	01/13/22	1301833
10+ years	Pennsylvania	Sci Mahanoy	Minimal Risk	Own	11/06/21	07/14/21	07/14/21	Fully Paid	08/14/21	1291243
10+ years	Florida	Tech Data Corp	Minimal Risk	Mortgage	02/09/21	06/15/21	10/12/21	Charged Off	11/12/21	1299335
10+ years	Michigan	Tellow Contracting	Low Risk	Mortgage	09/02/21	03/16/21	03/16/21	Fully Paid	04/16/21	1298401
10+ years	Texas	Ericsson	Low Risk	Mortgage	07/22/21	09/13/21	08/13/21	Fully Paid	09/13/21	1289131
3 years	California	Myrvpartsplace.Com	Low Risk	Rent	11/09/21	03/13/21	10/12/21	Charged Off	11/12/21	1295018
5 years	California	Henkel Corporation	Low Risk	Rent	11/12/21	12/14/21	12/14/21	Fully Paid	01/14/22	1249642
4 years	Illinois	Axa Assistance	Low Risk	Rent	11/10/21	12/14/21	10/14/22	Fully Paid	12/14/22	1293124
< 1 year	Rhode Island	Hsa-Uwc	Low Risk	Rent	11/12/21	02/14/21	10/13/21	Charged Off	11/13/21	1292578
1 year	Texas	Child's Day	Low Risk	Rent	02/12/21	04/16/21	12/14/21	Fully Paid	01/14/22	1277552
4 years	New York	Oec Freight	Moderate Risk	Rent	09/10/21	09/15/21	11/12/21	Fully Paid	12/12/21	1291775
10+ years	Florida	Sandestin Beach Hilton	Low Risk	Mortgage	12/12/21	12/14/21	12/14/21	Fully Paid	01/14/22	1291322
10+ years	Maryland	Others	Medium Risk	Own	02/02/21	05/16/21	02/15/21	Fully Paid	03/15/21	1289636
6 years	Wisconsin	Norman G. Olson Insurance	Minimal Risk	Rent	07/07/21	04/16/21	08/10/21	Fully Paid	09/10/21	112227
< 1 year	Florida	Others	Minimal Risk	Mortgage	08/01/21	05/16/21	02/10/21	Charged Off	03/10/21	183496
< 1 year	Michigan	Infotrieve, Inc.	Low Risk	Mortgage	09/08/21	05/16/21	06/11/21	Charged Off	07/11/21	232106
4 years	Maryland	Self Employed	Moderate Risk	Own	08/01/21	12/09/21	08/08/21	Charged Off	09/08/21	211606
10+ years	Nevada	Clark County School District	Minimal Risk	Mortgage	11/01/21	02/13/21	08/12/21	Charged Off	09/12/21	847024
6 years	Pennsylvania	The Mount Sinai School Of Medicine	Minimal Risk	Mortgage	11/11/21	11/13/21	06/13/21	Charged Off	07/13/21	1233120
< 1 year	Georgia	Blue Ridge Design Group	Minimal Risk	Mortgage	09/06/21	05/16/21	12/09/21	Charged Off	01/09/22	454145
10+ years	Michigan	Abbott Nutrition	Minimal Risk	Mortgage	09/10/21	05/16/21	02/12/21	Charged Off	03/12/21	544784
3 years	Michigan	Rice &Werthmann	Minimal Risk	Mortgage	11/01/21	05/16/21	10/13/21	Charged Off	11/13/21	843127
6 years	Utah	Five County Assoc Of Governments	Minimal Risk	Mortgage	11/06/21	05/16/21	07/12/21	Charged Off	08/12/21	985412
< 1 year	Georgia	North Ga Dentention Center	Low Risk	Mortgage	10/01/21	11/10/21	07/10/21	Charged Off	08/10/21	570309
6 years	Washington	Others	Low Risk	Mortgage	11/05/21	05/16/21	01/13/21	Charged Off	02/13/21	942813
6 years	Florida	Sky Powersports	Moderate Risk	Mortgage	11/11/21	04/14/21	12/13/21	Charged Off	01/13/22	1255647
2 years	Florida	Synovus Bank	Medium Risk	Mortgage	10/03/21	12/12/21	07/12/21	Charged Off	08/12/21	624878
< 1 year	Georgia	Acumen Fiscal Agent/MS Robinson	Minimal Risk	Own	10/05/21	01/12/21	08/11/21	Charged Off	09/11/21	671773
10+ years	California	Inspired Automation Inc	Minimal Risk	Own	10/01/21	03/12/21	10/11/21	Charged Off	11/11/21	593245
10+ years	New Hampshire	Self	Low Risk	Own	09/05/21	06/11/21	01/11/21	Charged Off	02/11/21	432187
1 year	Texas	Able Electronics	Low Risk	Own	11/04/21	12/13/21	07/13/21	Charged Off	08/13/21	920793
< 1 year	Pennsylvania	Abraxas I	Moderate Risk	Own	09/07/21	05/16/21	10/09/21	Charged Off	11/09/21	506847

DASHBOARD



DASHBOARD



TDI BANK LOAN ANALYSIS

Total Loan Application
38,574

Total Loan Amount
\$435.75M

Total Loan Payment
\$473.07M

Average Interest Rate
12.05%

Approval Rating
83.33%

DTI Ratio Level

- High
- Low
- Manageable

Total Credit ...

- Heavy Credit (8...)
- High Credit (41-...)
- Low Credit (1-20)

Loan Verific...

- Not Verified
- Source Verified
- Verified

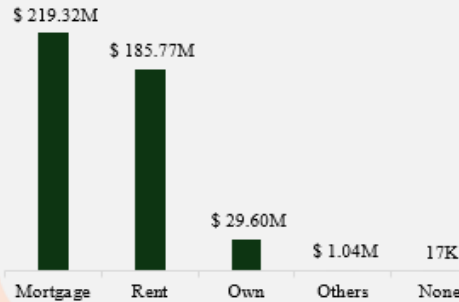
Loan Term (...)

- 36
- 60

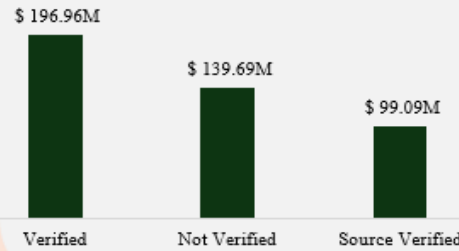
Home Owne...

- Mortgage
- None
- Others

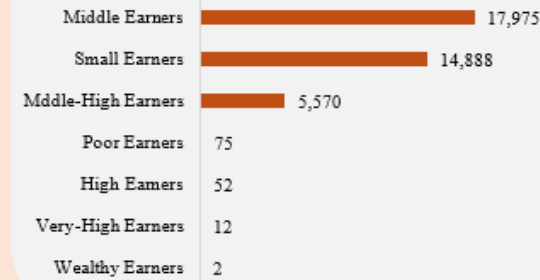
Home Status by Loan Amount



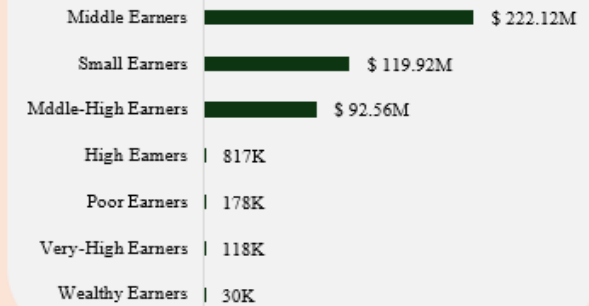
Verificatin Status by Loan Amount



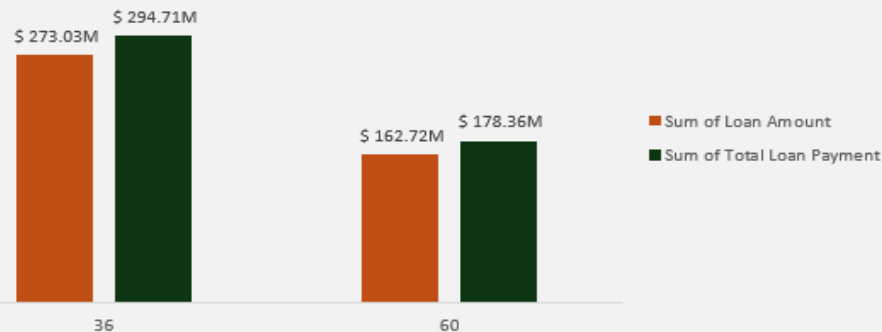
Income by Credit Lines



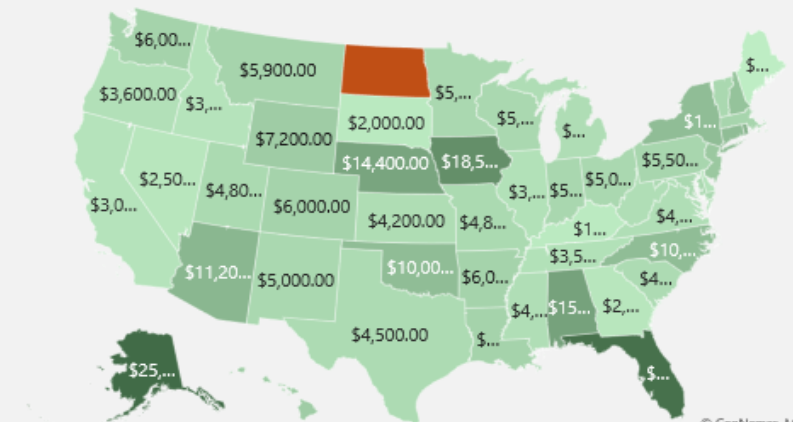
Income by Loan Amount



Loan Term by Amount Given & Received



Regions by Loan Amount



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KEY PERFORMANCE INDICATORS



Total Loan Application	Total Loan Amount	Total Loan Payment	Average Interest Rate	Approval Rating
38,574	\$435.75M	\$473.07M	12.05%	83.33%

From the analysis, the following KPIs were generated.

The total loan amount disbursed by Data Immersed (TDI) to borrowers is \$435.75M.

TDI has received a total of 38,574 loan applications.

The average interest rate attached to TDI loans is 12.05%.

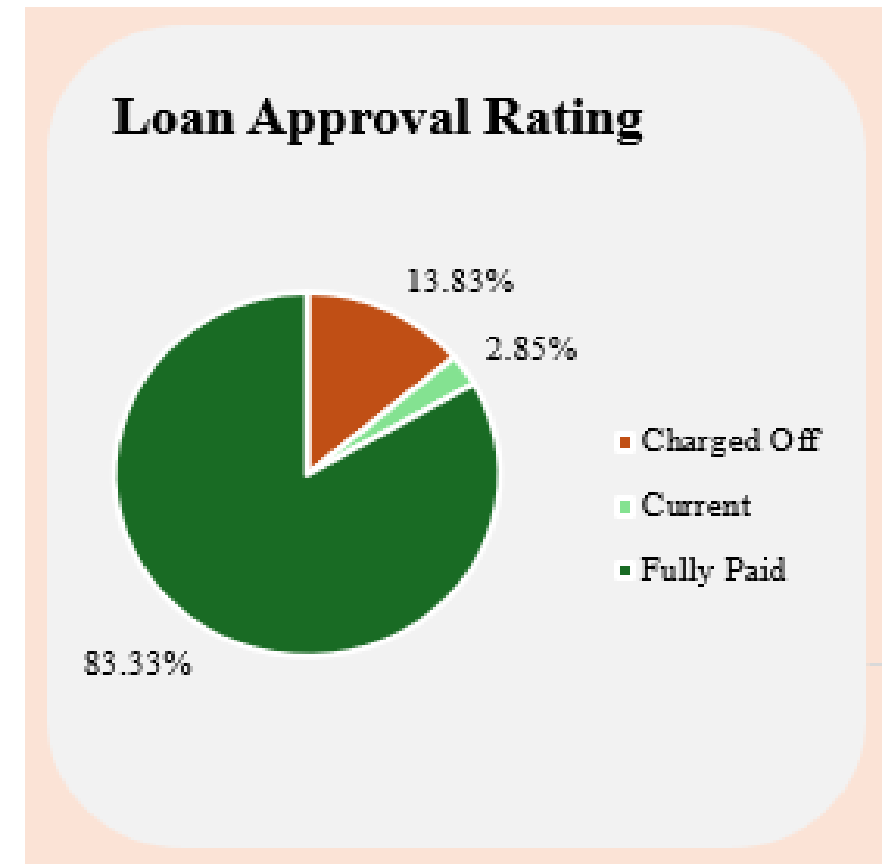
The total amount generated from all paid loans is \$473.07M

TDI has generated 83.33% of total paid loans by borrowers.

LOAN APPROVAL RATING

The pie chart on the Loan Data Analysis Dashboard shows that 83.33% of loans are fully paid, reflecting strong lending practices, while 13.83% are charged off, highlighting potential risks in borrower evaluation.

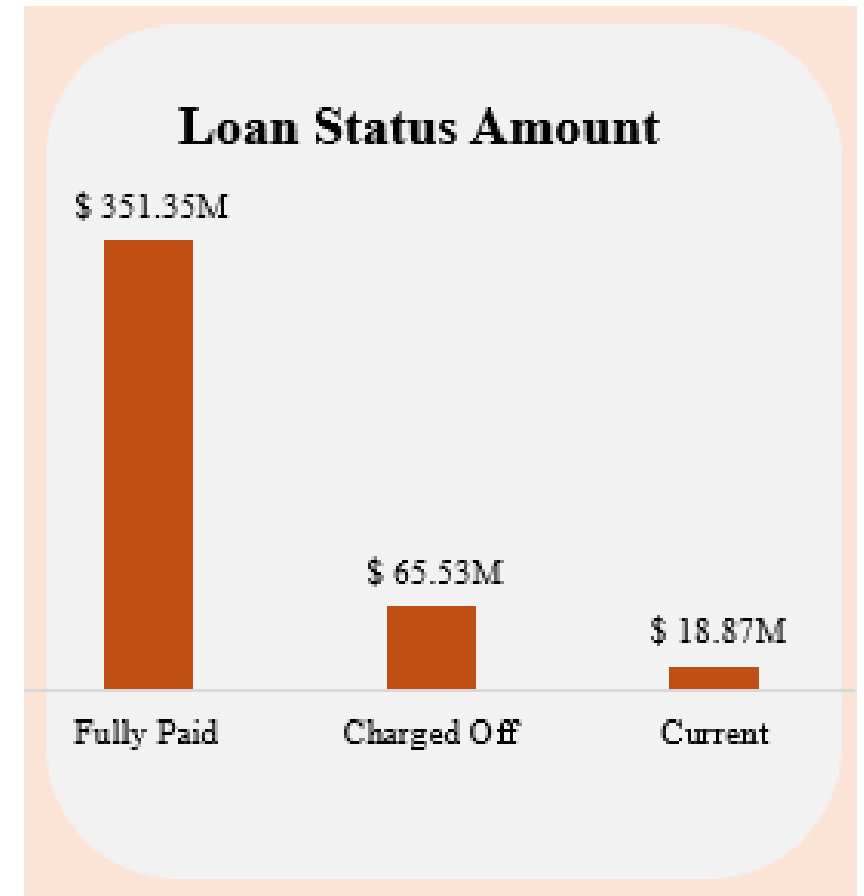
Additionally, 2.85% of loans are currently active, suggesting the need for monitoring to prevent future payment issues.



LOAN STATUS AMOUNT

TDI has successfully generated \$351.35M in fully paid loans, indicating strong loan management and positive customer repayment behavior. However, the \$65.53M in charged-off loans suggests that improvements are needed in risk assessment and loan approval processes.

The \$18.87M in current loans should be closely monitored to assess their future impact on TDI's loan portfolio.



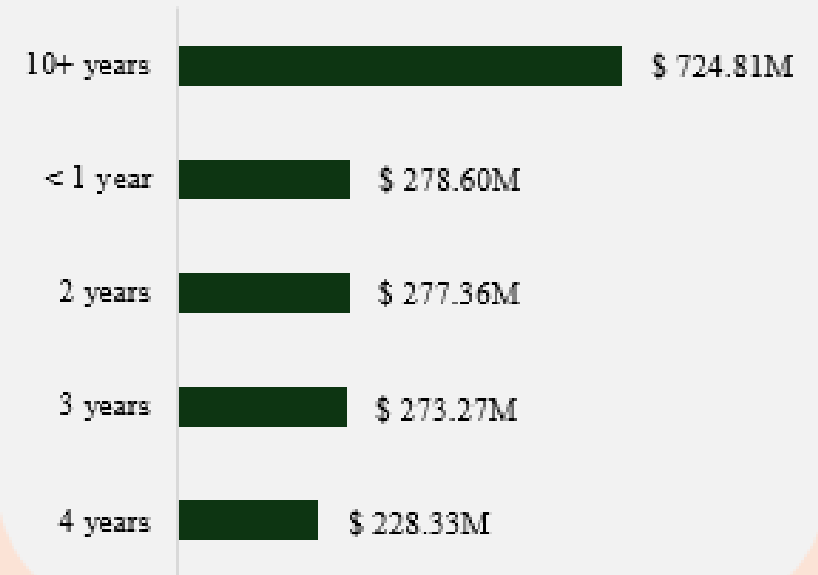
JOB LENGTH BY INCOME



Borrowers with 10 years or more in their jobs earn the most at \$724.81 million, but those with shorter job lengths sometimes earn more than those with 6-9 years of experience.

This suggests that job length doesn't always predict income, which could be important for TDI when checking income for loan approval.

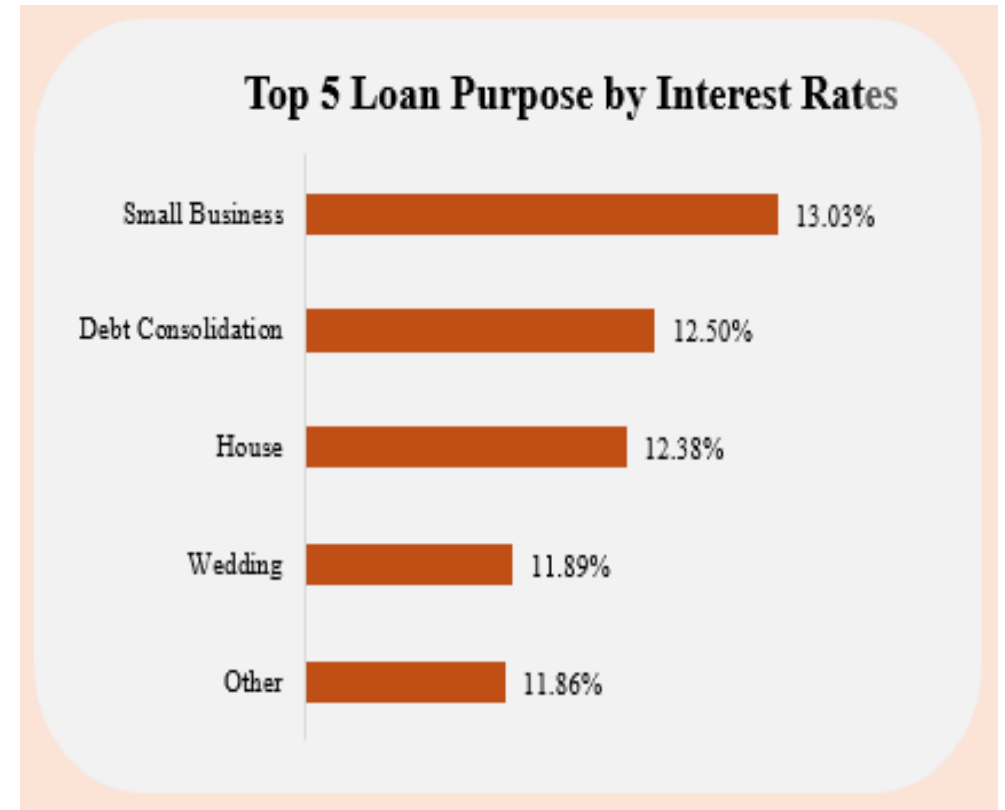
Top 5 Job Length by Income



LOAN PURPOSE BY INTEREST RATES

Small Business, Debt Consolidation, and House Loans have the highest interest rates at 13.03%, 12.50%, and 12.38% making them riskier for both TDI and borrowers, while Car Loans have the lowest rates, making them safer.

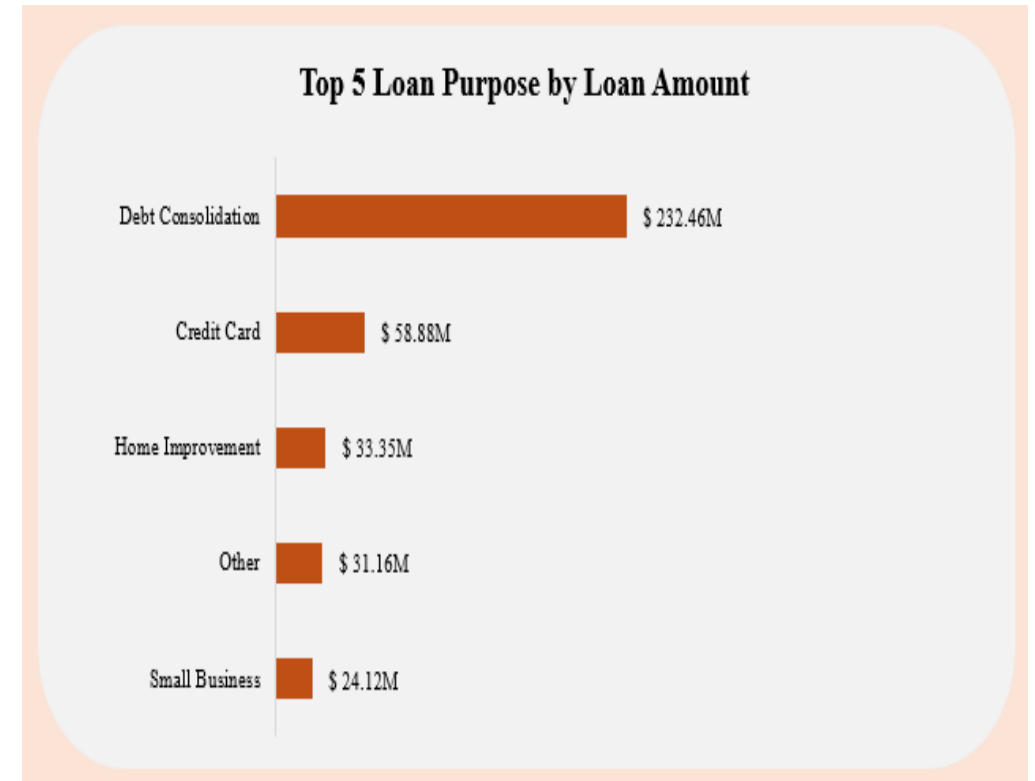
Medical and personal loans have lower interest rates, around 11%, which is below the average of 12.05%.



LOAN PURPOSE BY LOAN AMOUNT

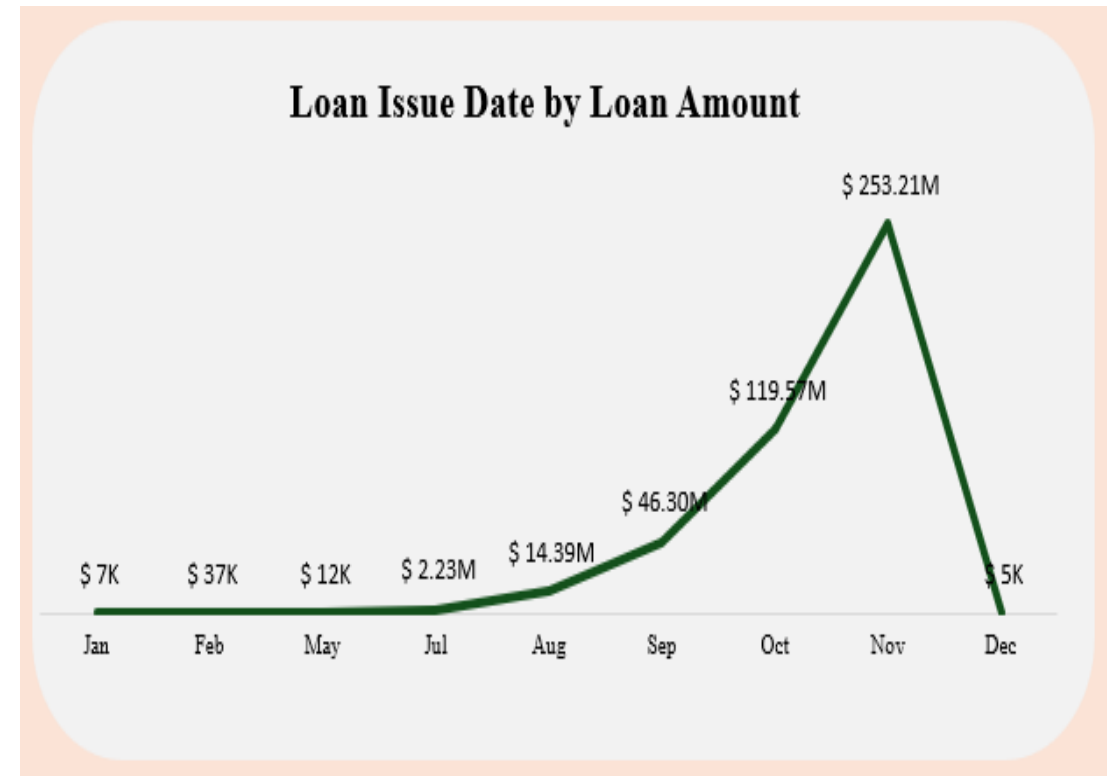
The analysis shows that Debt Consolidation, Credit Cards, and Home Improvement loans have the highest amounts. Debt Consolidation loans have led to over \$36 million in losses for TDI.

Furthermore, when looking at the loans that were charged off compared to their total amounts, it suggests a higher chance of non-repayment, making these loans high-risk for TDI.



LOAN ISSUE DATE BY LOAN AMOUNT

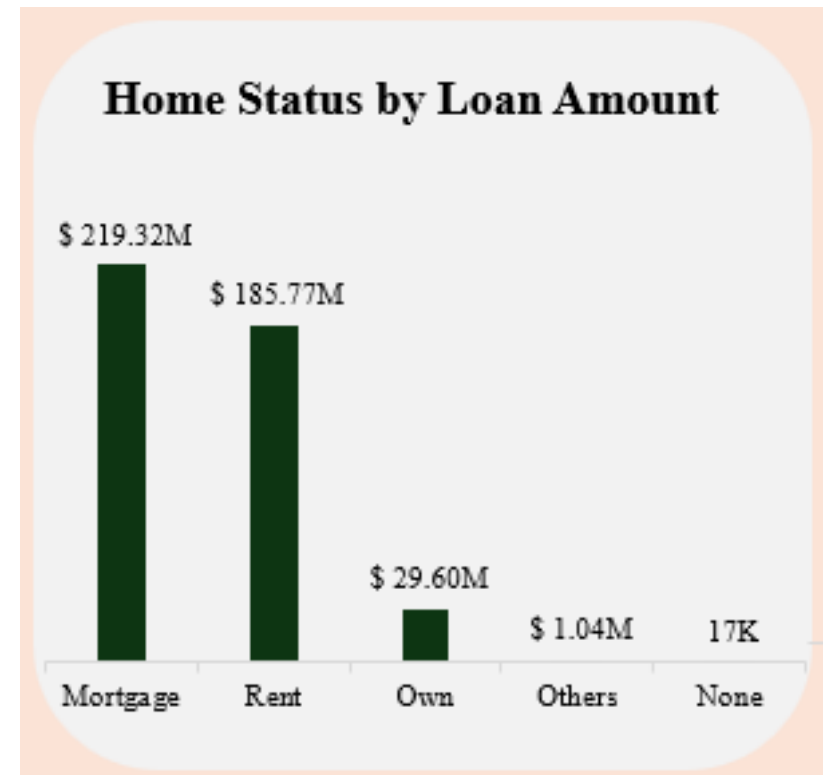
The analysis of loan amounts over time shows a steady increase from \$7,000 in January to \$37,000 in February, followed by stability until a significant spike from \$12,000 to \$232 million between July and November, with November marking the peak of loan activity.



HOME STATUS BY LOAN AMOUNT

People with mortgages borrow the most, around \$219.32 million, likely to pay for their homes or make improvements.

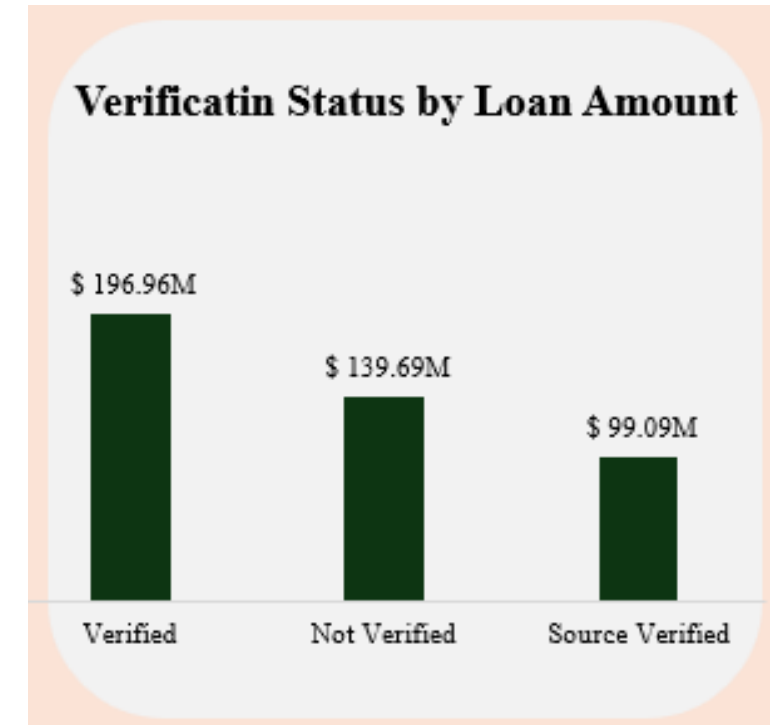
Renters borrow about \$185.77 million, possibly due to higher expenses, while homeowners borrow the least, around \$29.60 million, as they may not need loans since they don't have a mortgage.



VERIFICATION STATUS BY LOAN AMOUNT

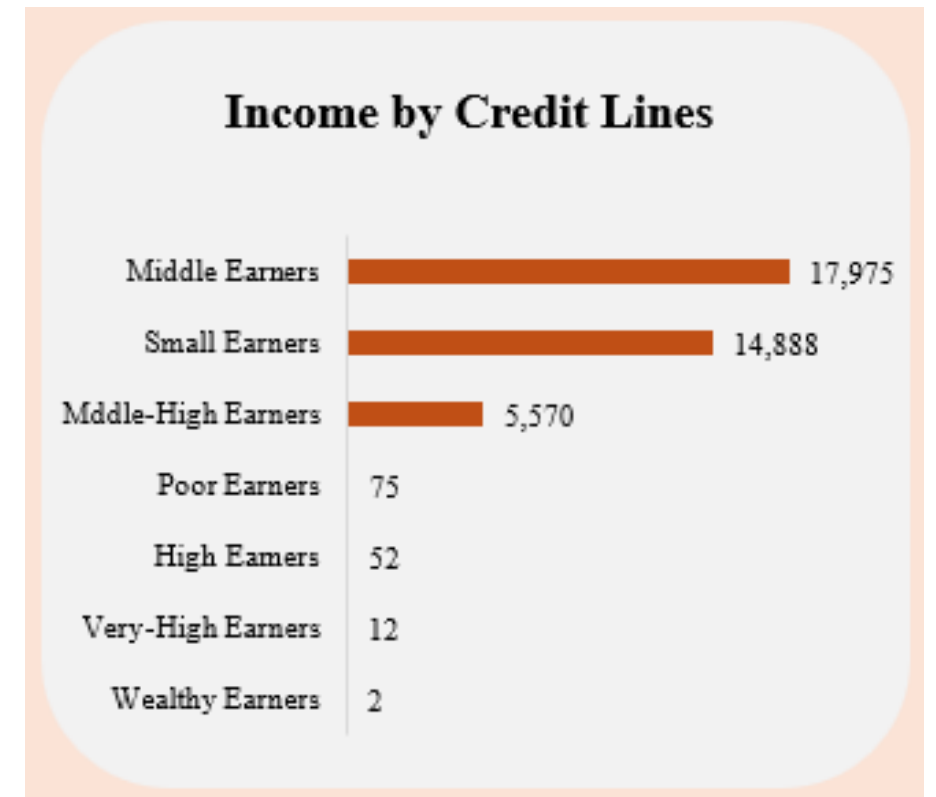
Borrowers in the Verified category have the highest total loans of \$196.96 million, as TDI has confirmed their information through proper documents.

Not-verified customers have borrowed \$139.69 million, as TDI accepts their information without formal checks, and source-verified customers, who have their information confirmed directly with employers, have the lowest total loans at \$99.09 million.



INCOME BY CREDIT LINES

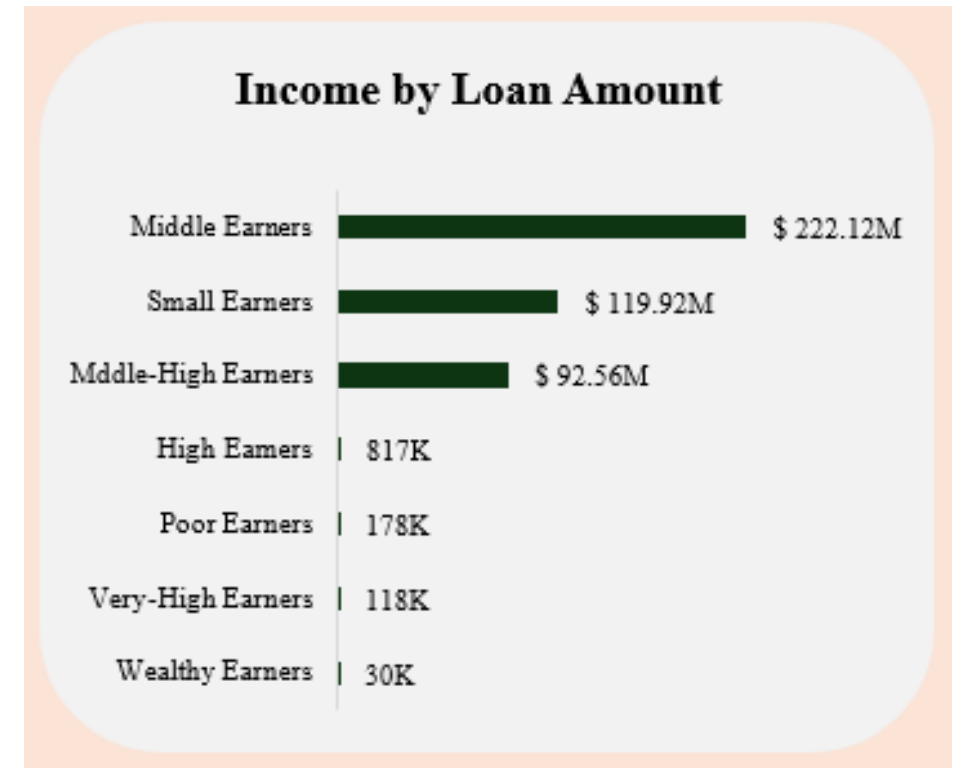
Analyzing TDI borrowers' income levels alongside their credit lines shows that many lower-income borrowers have a lot of credit lines. This suggests they may struggle to make payments on multiple loans, increasing their risk of not paying back. TDI should be careful when approving loans or giving more credit to these borrowers



INCOME BY LOAN AMOUNT

Knowing how borrowers' income levels relate to their loan amounts can help lenders understand the risk of not getting paid back.

The analysis shows that middle earners, small earners, and middle-high earners have taken out larger loans than other groups. This raises concerns because giving larger loans to people with lower incomes increases the chances of defaults.



LOAN TERM BY AMOUNT

Borrowers prefer shorter loans of 36 months, which have a total amount of \$273.03 million, compared to \$162.72 million for 60-month loans.

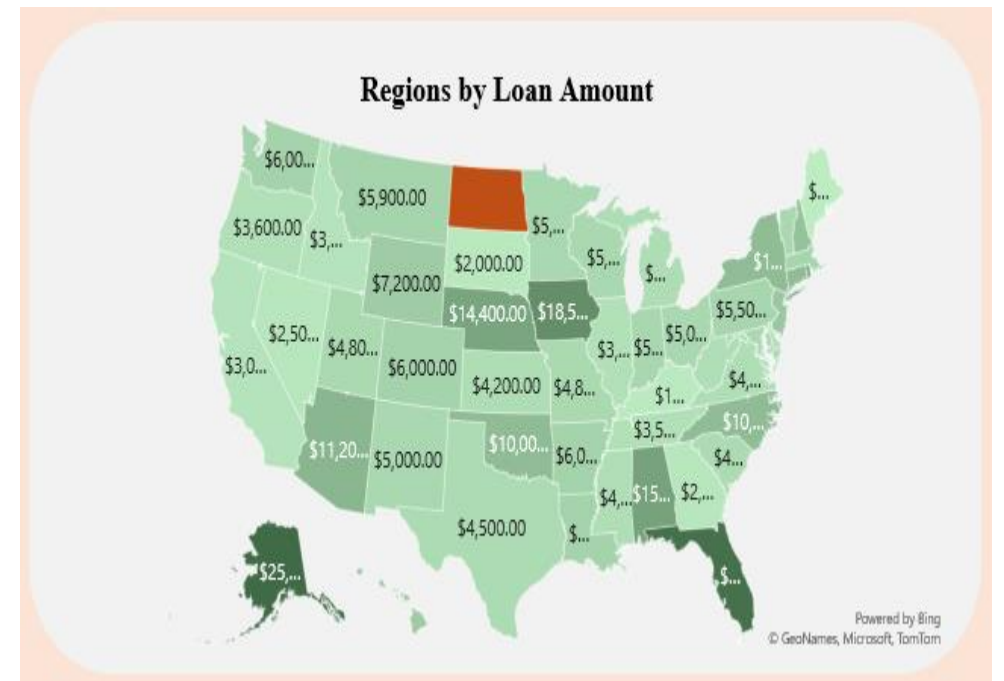
Short-term loans may have higher monthly repayments due to a shorter repayment period, while long-term loans allow for larger amounts and smaller monthly payments but can result in paying more total interest over the loan term.



REGION BY LOAN AMOUNT

TDI sees where people are asking for the most money and where they might need more help.

California has the highest loan amount at \$78.48M, while New York is close behind at \$42.07M. On the other hand, Maine has the lowest loan amount at only \$9K, which suggests people there may not be borrowing as much.



CONCLUSION



TDI's loan analysis reveals that a large majority of loans are paid back, but there are still significant charged-off loans that indicate a need for better risk management. The interest rates differ by loan type, with some loans being riskier than others, suggesting TDI may need to adjust these rates. By focusing on verifying borrower information and recognizing where demand is high, TDI can improve its lending process and better serve its customers

A large green triangle is positioned in the top-left corner of the slide, pointing downwards and to the right.

QUESTIONS



THANK YOU