

LOAN DEFaulTER ANALYTICS

Financial Services – Lending & Credit Risk Management

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CONTEXT & PROBLEM STATEMENT



SECTOR CONTEXT

- Rising credit-risk volatility and capital-efficiency pressures demand proactive default management
- Increased regulatory and investor scrutiny on NPLs and provisioning
- Need for data-driven insights to optimize risk-return across lending portfolios



PROBLEM STATEMENT

Pinpoint high-risk borrower and loan segments and refine underwriting, pricing, and terms to cut expected losses while preserving growth.



OBJECTIVE

- Set risk-based thresholds for LTV, DIR, credit score, and product features
- Align pricing (interest-rate spread) and term structures with risk
- Use default-probability scores to prioritize collections and early interventions

DATA ENGINEERING

(SOURCE TO SINK)

SOURCE

- DATASET NAME: Loan Defaulters
- SIZE : 20,000 rows× 34 columns
- TIME PERIOD : 2019

CLEANING

- Nulls
- Outliers
- Consistency
- Categorical normalization

DICTIONARY

- loan_amount
- Credit_Score
- Income_Parsed
- Property_Value
- Default Possibility

KPI & METRICS FRAMEWORK

WHAT ARE WE MEASURING?

- High Default Risk Ratio (9.41%)
- Avg. Credit Score (698.70)
- Avg. LTV Ratio (72.95)
- Risk Segmentation

WHY THESE KPIS?

- Risk Mitigation: High Default Ratio & Credit Scores flag potential losses before they happen.
- Asset Security: LTV ensures collateral is sufficient to cover the loan in case of default.
- Precision Targeting: Pinpoints high-risk clusters to refine lending policy.

KEY INSIGHTS (EDA)

PORTFOLIO & BORROWER TRENDS

- Risk Concentration: While low-risk loans lead, 9.41% of the portfolio is categorised as High Default Risk.
- Demographic Exposure: Lending is heavily concentrated in the 35–55 age bracket, representing the bank's core exposure.
- Credit Vulnerability: The 500–600 score segment accounts for 43.4% of total credit risk.

RISK & EXPOSURE SIGNALS

- Geographic Hotspots: The North and South regions drive the highest volume of default cases.
- Product Risk: Cash-Out Refinance and Home Improvement loans are the primary drivers of high-risk loan amounts.
- Long-term Liability: 84% of loans carry 25–30 year tenures, extending the bank's default exposure over decades.

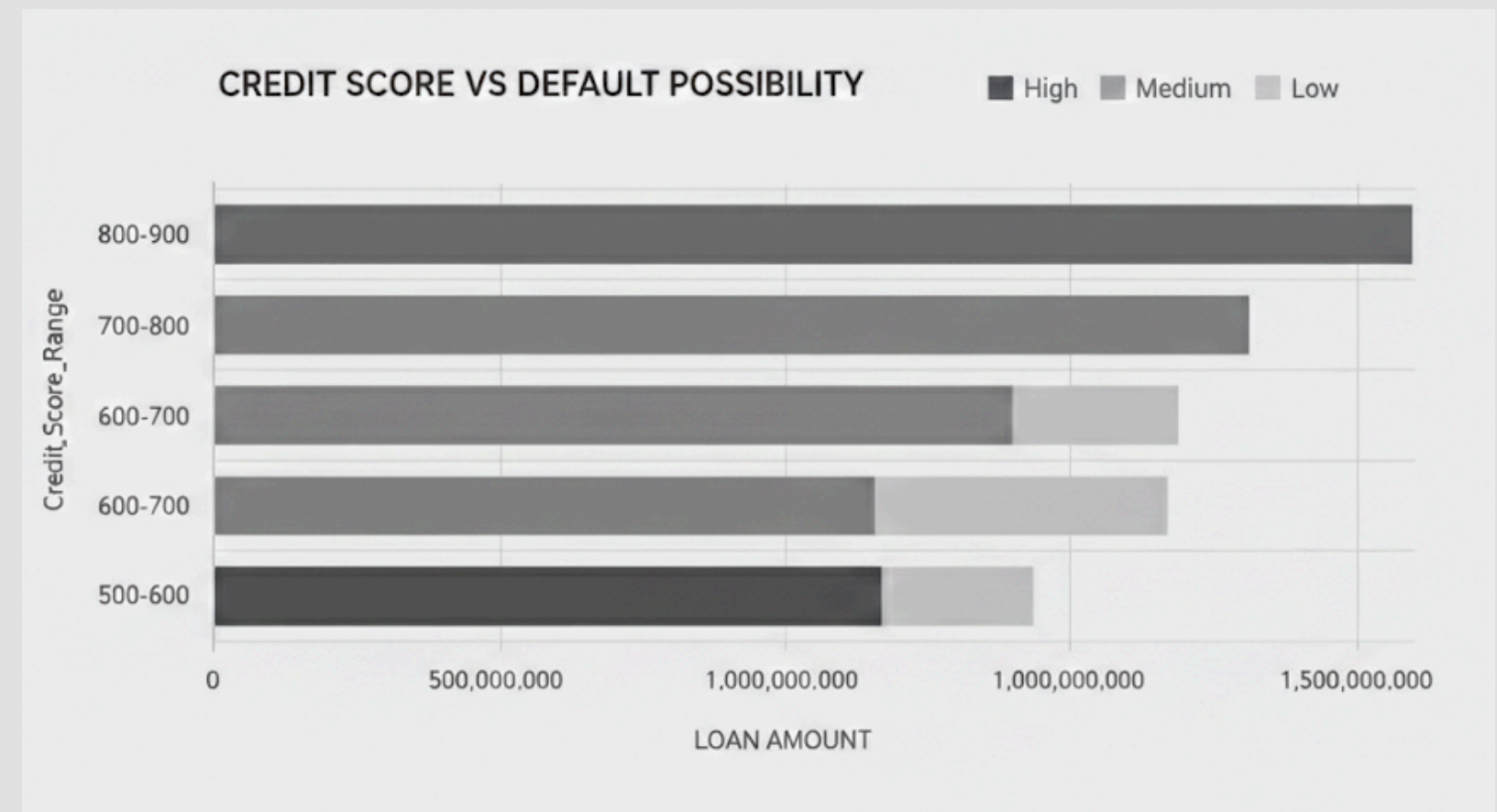
ADVANCED ANALYSIS

What we did?

- Multivariate Segmentation: Cross-analyzed Credit Scores against Loan Purpose.
- Root Cause Analysis: Isolated drivers behind the 9.41% High-Risk Ratio.

What we learned?

- Risk Intersections: Defaults peak when low credit scores (500-600) meet Cash-Out Refinancing.
- Regional Drivers: The North and South act as primary geographic risk centers.
- Structural Risk: Heavy reliance on 30-year tenures creates long-term portfolio vulnerability.



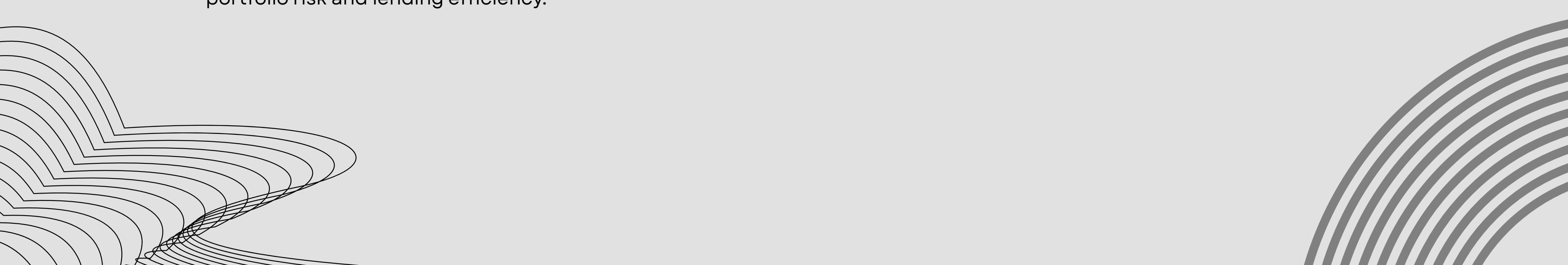


DASHBOARD WALKTHROUGH

Executive View

- Total Exposure: Tracks \$6.63B in total loan value across 20,000 accounts.
- Health Check: Monitors the 9.41% High Default Risk Ratio and 698.70 Average Credit Score.
- Purpose: Provides leadership an instant snapshot of overall portfolio risk and lending efficiency.

Operational View

- Risk Hotspots: Pinpoints the North region as a primary driver of high-risk cases (943 defaults).
 - Vulnerability Analysis: Identifies the 500–600 credit score range as the highest risk segment by loan volume.
 - Purpose: Enables teams to refine lending criteria for specific regions and borrower profiles.
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RECOMMENDATIONS

- *Tighten Approvals: Stricter criteria for 500–600 credit scores (43.4% of total risk).*
- *Regional Caps: Limit exposure in North/South regions to lower high-risk volume.*
- *Product Shift: Reduce Cash-Out Refinance and Home Improvement loan concentrations.*
- *Term Reduction: Incentivize shorter tenures to mitigate 30-year exposure (84% of portfolio).*
- *Active Monitoring: Use the 9.41% Risk Ratio as a trigger for early borrower intervention.*

IMPACT & VALUE

- **Risk Reduction:** Stricter 500–600 credit score policies could mitigate up to 43.4% of high-risk exposure.
- **Capital Preservation:** Addressing the 9.41% High Default Risk protects the \$6.63B total loan portfolio.

- **Operational Efficiency:** Targeting the North/South regions optimizes debt collection and resource allocation.
- **Long-term Stability:** Reducing 30-year term dominance lowers the bank's decade-long vulnerability to market shifts.

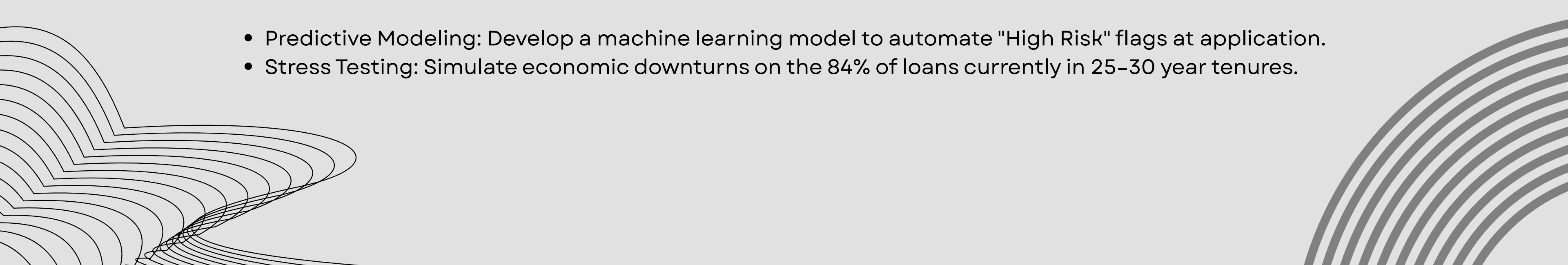


LIMITATIONS & NEXT STEPS

Limitations (Data Gaps)

- Static Snapshot: Analysis lacks historical default trends over time to see if the 9.41% risk is rising or falling.
- Missing Variables: Current data lacks borrower income-to-debt ratios and employment history.
- Geographic Detail: Regional data is broad; city-level data would enable more precise targeting.

Next Steps

- Predictive Modeling: Develop a machine learning model to automate "High Risk" flags at application.
 - Stress Testing: Simulate economic downturns on the 84% of loans currently in 25–30 year tenures.
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THANK YOU