

Auto Loan Application Assessment Model Report

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1. Model Overview

Model Type:	XGBoost Classifier
Model Version:	1.0
Training Date:	2025-02-24 21:14:45
Dataset Size:	10459 rows, 39 columns
Training Samples:	8367
Test Samples:	2092
Features Count:	37
Training Time:	32.90 seconds

2. Model Performance Metrics

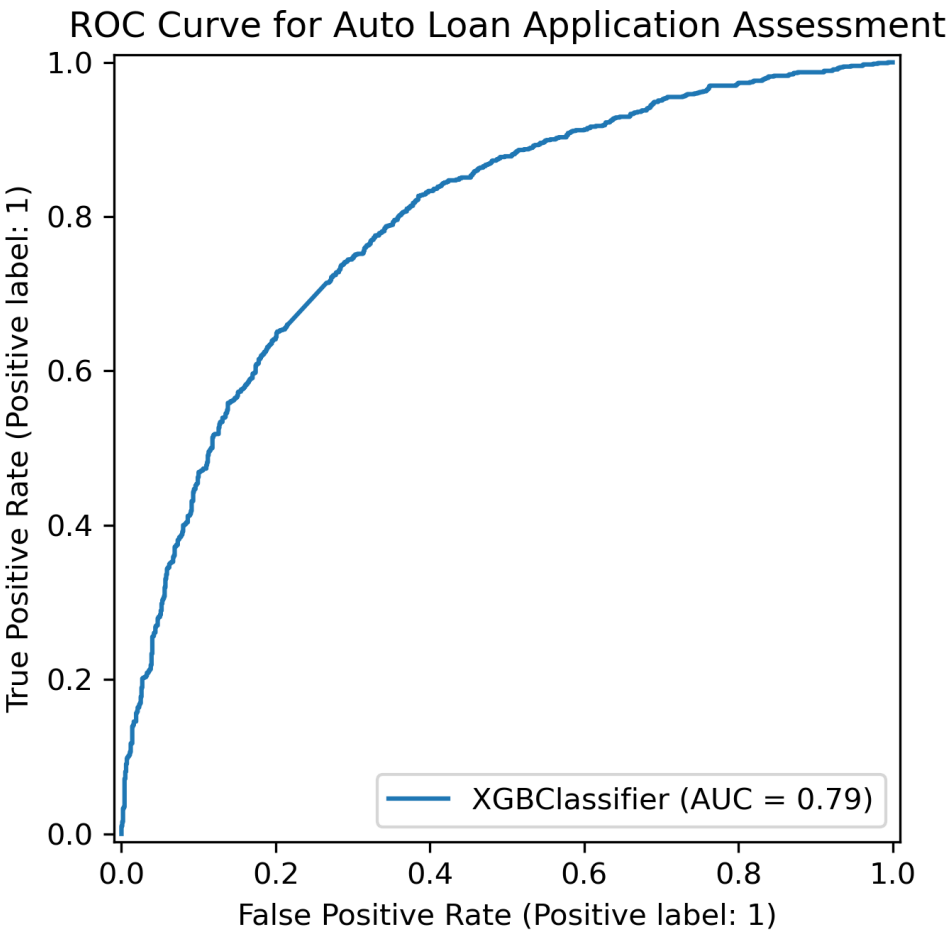
Accuracy:	0.6707
ROC-AUC Score:	0.7945
Precision:	0.9406
Recall/Sensitivity:	0.0870
Specificity:	0.9940
F1 Score:	0.1593

3. Best Model Parameters

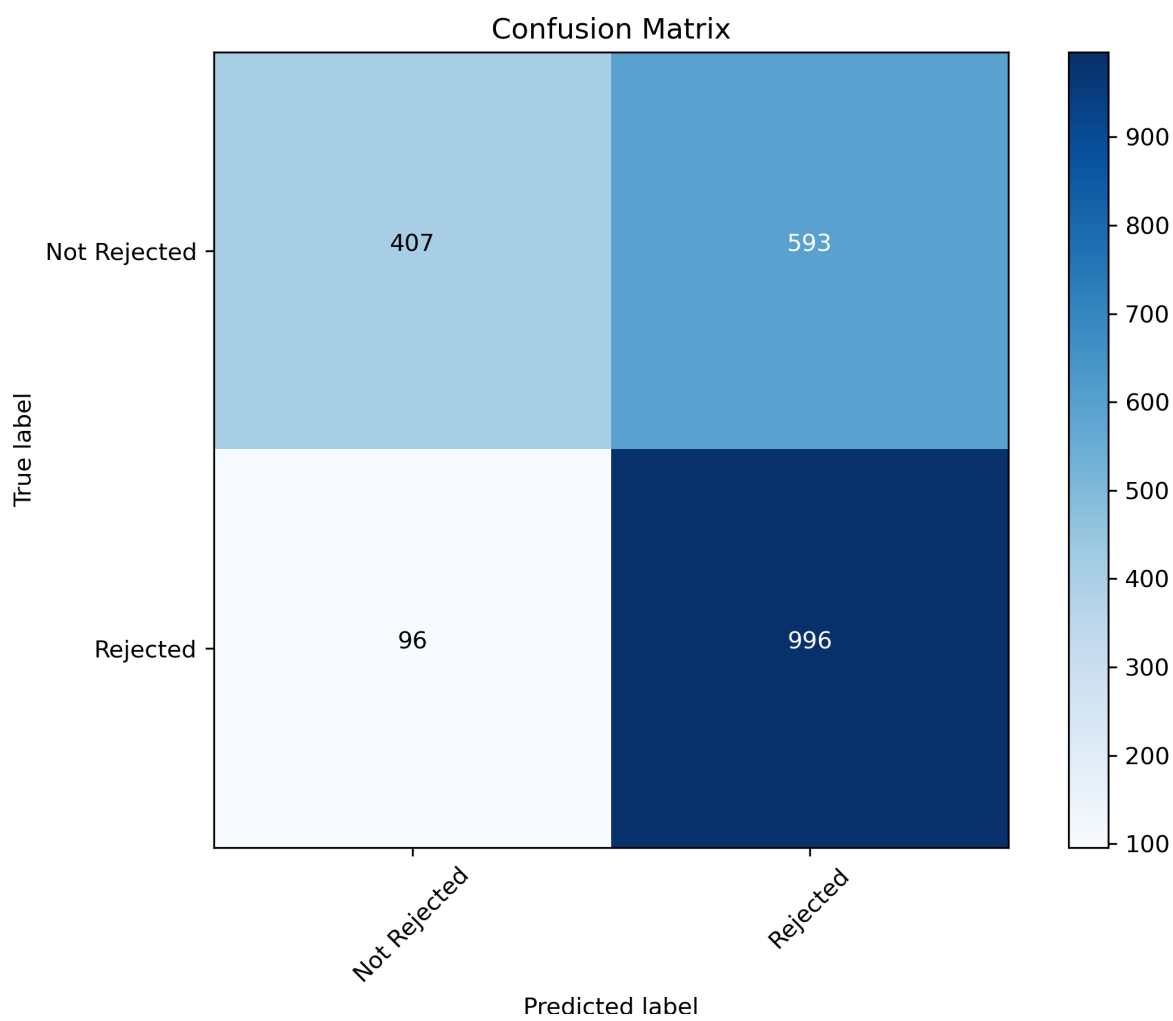
subsample:	0.9
scale_pos_weight:	3
n_estimators:	200
min_child_weight:	2
max_depth:	3
learning_rate:	0.1
lambda:	0.8
gamma:	0.2
colsample_bytree:	0.5
alpha:	0.5

4. Visualizations

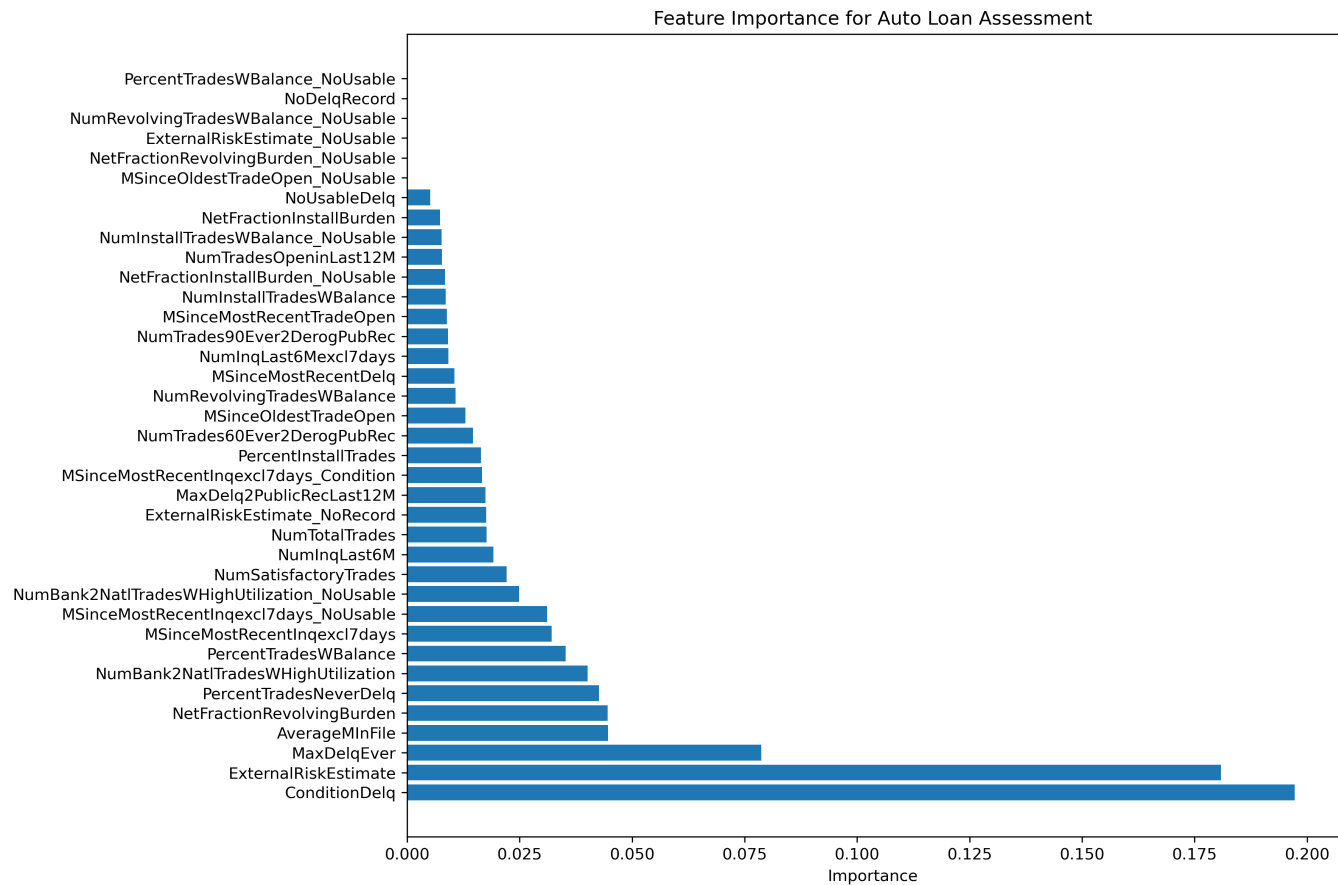
ROC Curve



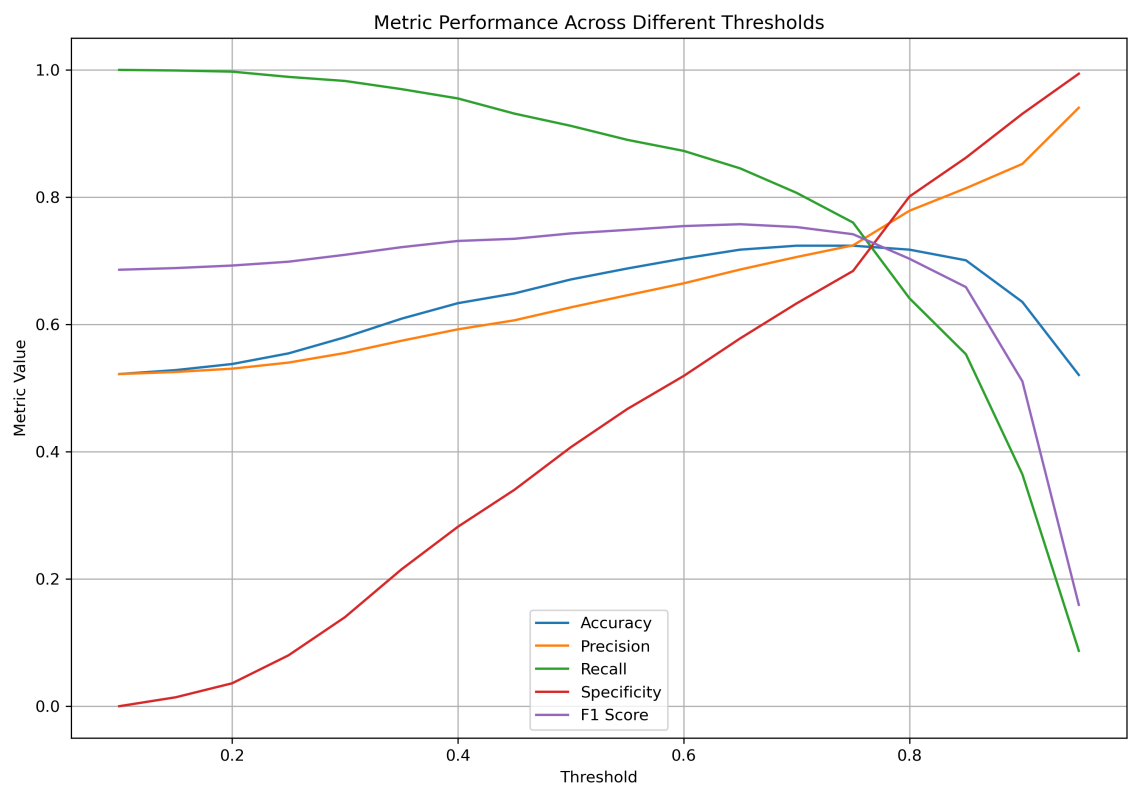
Confusion Matrix



Feature Importance



Threshold Analysis



Top 5 Optimal Thresholds (by F1 Score)

Threshold	Accuracy	Precision	Recall	Specificity	F1 Score
0.65	0.7175	0.6862	0.8452	0.5780	0.7575
0.60	0.7036	0.6646	0.8727	0.5190	0.7546
0.70	0.7237	0.7059	0.8068	0.6330	0.7530
0.55	0.6879	0.6458	0.8901	0.4670	0.7486
0.50	0.6707	0.6268	0.9121	0.4070	0.7430

5. Top 10 Most Important Features

Feature	Importance Score
ConditionDelq	0.1972
ExternalRiskEstimate	0.1808
MaxDelqEver	0.0787
AverageMInFile	0.0447
NetFractionRevolvingBurden	0.0446
PercentTradesNeverDelq	0.0426
NumBank2NatlTradesWHighUtilization	0.0401
PercentTradesWBalance	0.0352
MSinceMostRecentInqexcl7days	0.0321
MSinceMostRecentInqexcl7days_NoUsable	0.0311

6. Conclusions and Recommendations

Based on the model performance, we recommend using a probability threshold of 0.65 for optimal balance between precision and recall. This provides the best F1 score and helps ensure that loan applications are properly classified with minimal false positives and false negatives.

The model performance indicates that the features selected are strong predictors for loan application assessment. Regular retraining is recommended as market conditions change.