

Intro to Data Science
Final Project

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Today's Topics

Credit Decisions for
Newest Product:
Travel Card

Executive Summary

Data & Research

Analysis

Visualizations & Outputs

Conclusions

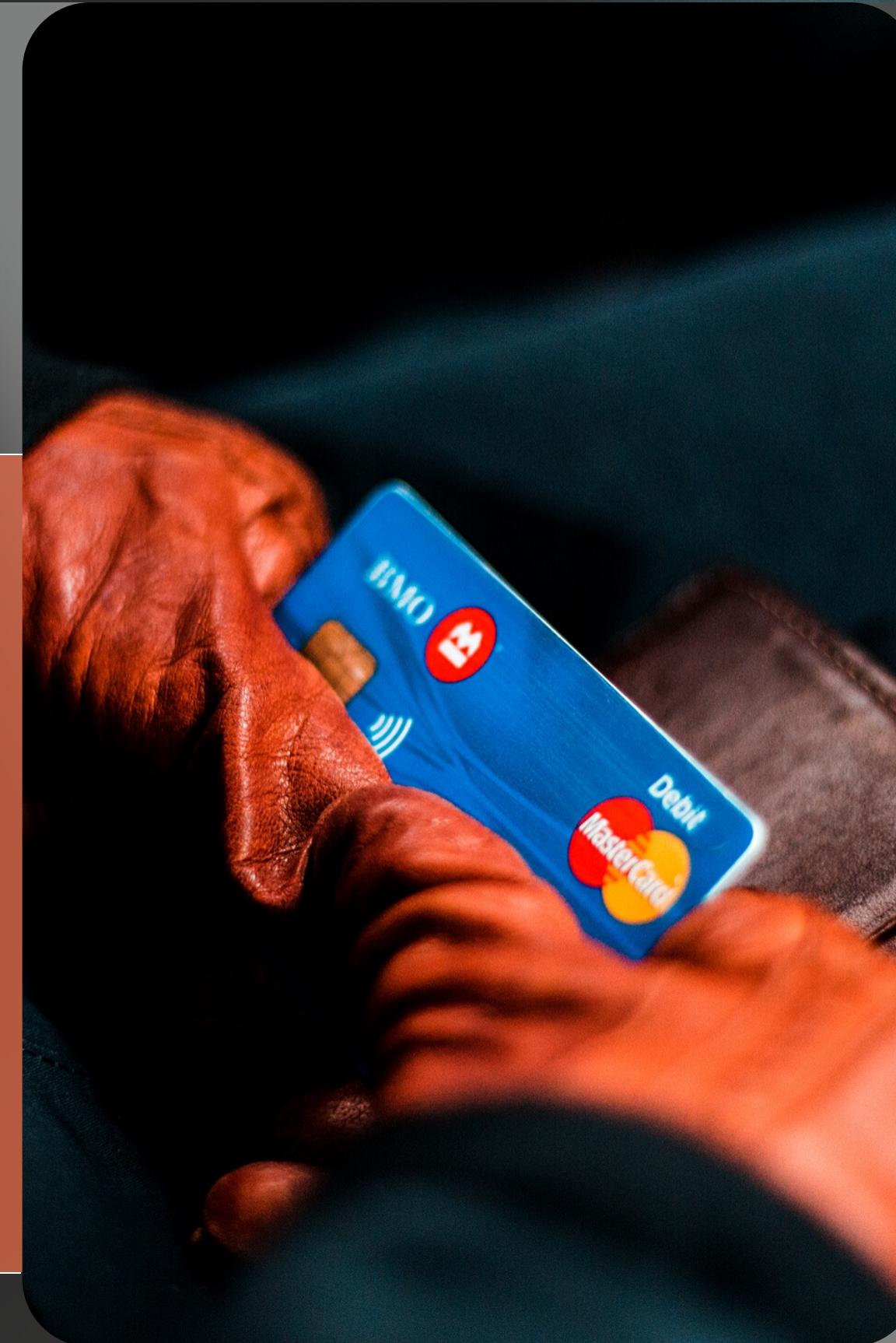
Assumptions

Q & A

Executive Summary

Engineering new algorithm to process instant credit decisions for new travel card.

We have released a new travel credit card that has received more applications than anticipated. Our CEO has tasked us with automating and optimizing the approval process. Our direct competitors are also releasing similar programs in anticipation for post-covid travel. In order to remain competitive, we need to develop an algorithm that will provide an instant credit decision via our customers facing applications.

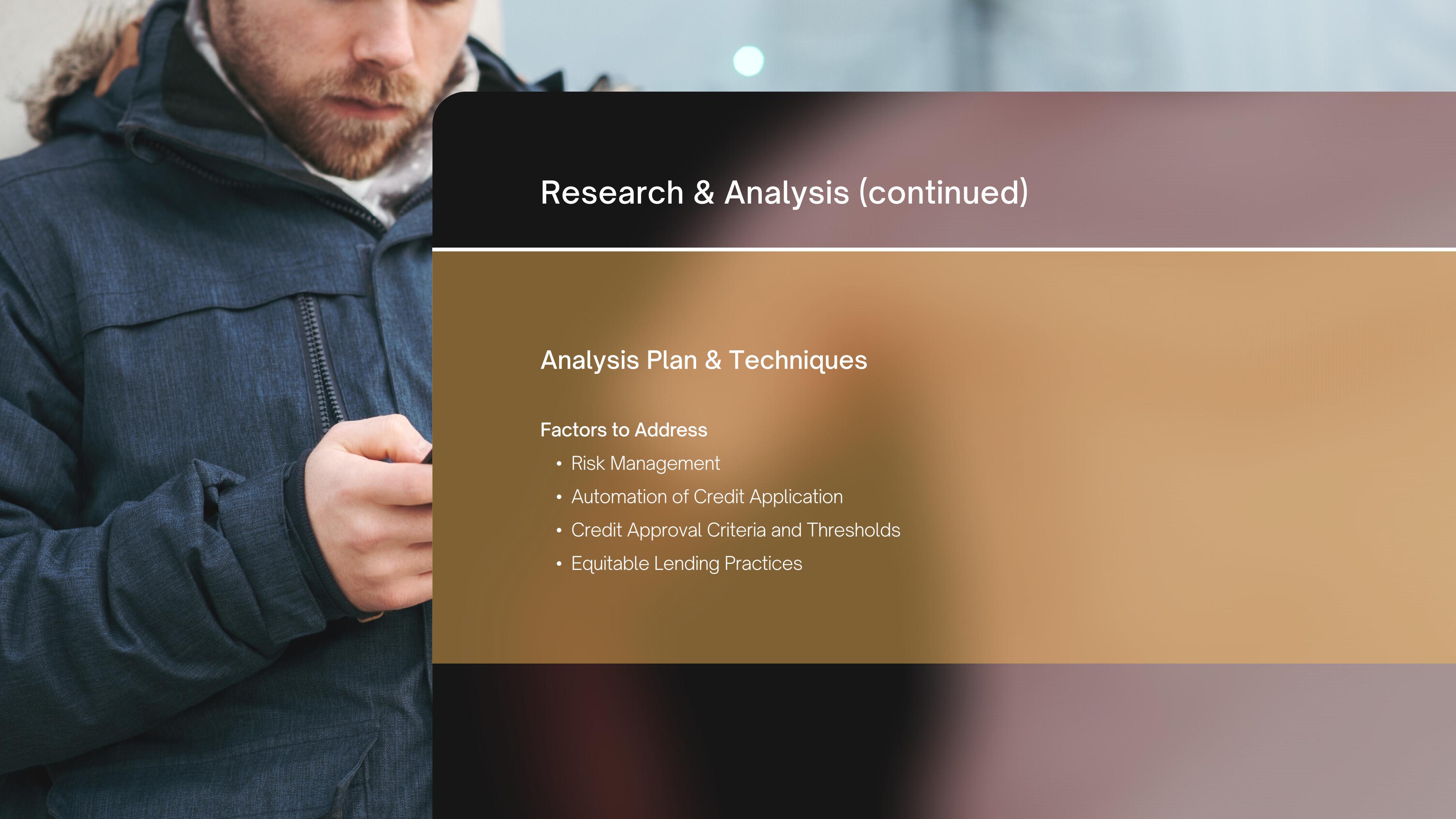




Data Collected & Research Conducted

Consumer Information

Utilizing a large dataset, we were able to focus on key subcategories and factors that are pivotal in the application decisions process. We omitted certain subcategories that are not essential to the credit decision making process.



Research & Analysis (continued)

Analysis Plan & Techniques

Factors to Address

- Risk Management
- Automation of Credit Application
- Credit Approval Criteria and Thresholds
- Equitable Lending Practices

Dataset Exploration



Cleaning & Transforming the Data

- Variables Omitted
- Variables We Cleaned
- Variables Kept

Variables

- Annual Income
- Owning A Car
- Owning Realty
- Number of Children
- Housing Type

Exploratory Data Analysis

Mean: \$187,524.29

Median: \$160,780.50

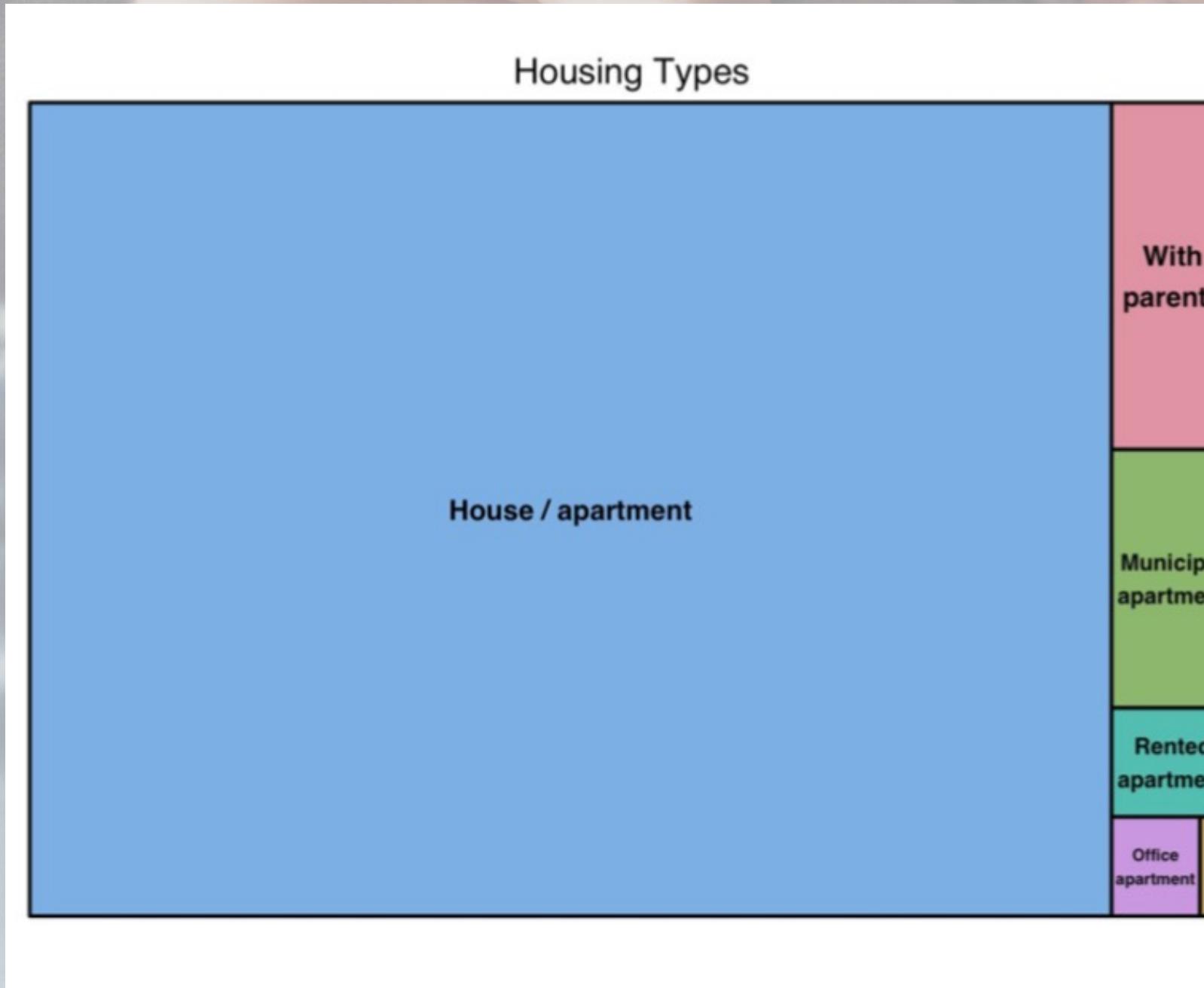
Standard Deviation: \$110,086.85

Minimum: \$26,100.00

Maximum: \$ 6,750,000.00

- 5 Number Summary & Data Visualizations

Housing Situation



Word Cloud

Sales staff
Managers
High skill tech staff
Drivers
Security staff
Private service staff
Cleaning staff
Accountants
Cooking staff
Core staff
Medicine staff
Laborers

Model Overview



Model Design

Weighted Variables

- Overall goal of the algorithm is to calculate a score between 0-100.
- Point System determines approval and APR.
- Credit Limit is determined by income tier structure.

- 50% - Annual Income
- 25% - Owning Realty
- 10% - Number of Children
- 10% - Housing Type
- 5% - Owning A Car

All applications begin with a score of zero, 5% APR, and line of credit based on their tier.

Establishing a Threshold

INCOME | Tier 1 \$0-\$250,000 | Tier 2 \$250,001-\$500,000 | Tier 3 \$500,001-\$750,000 |
Tier 4 \$750,000+

APR % | (Percent of Annual Income) Tier 1: 1% | Tier 2: 5% | Tier 3: 10% | Tier 4 15%



Approved or Denied

74.5% of total applicants were approved.

Based off the data, we were able to generate a threshold to provide instant approvals and denials, specifically for online applications.

APR

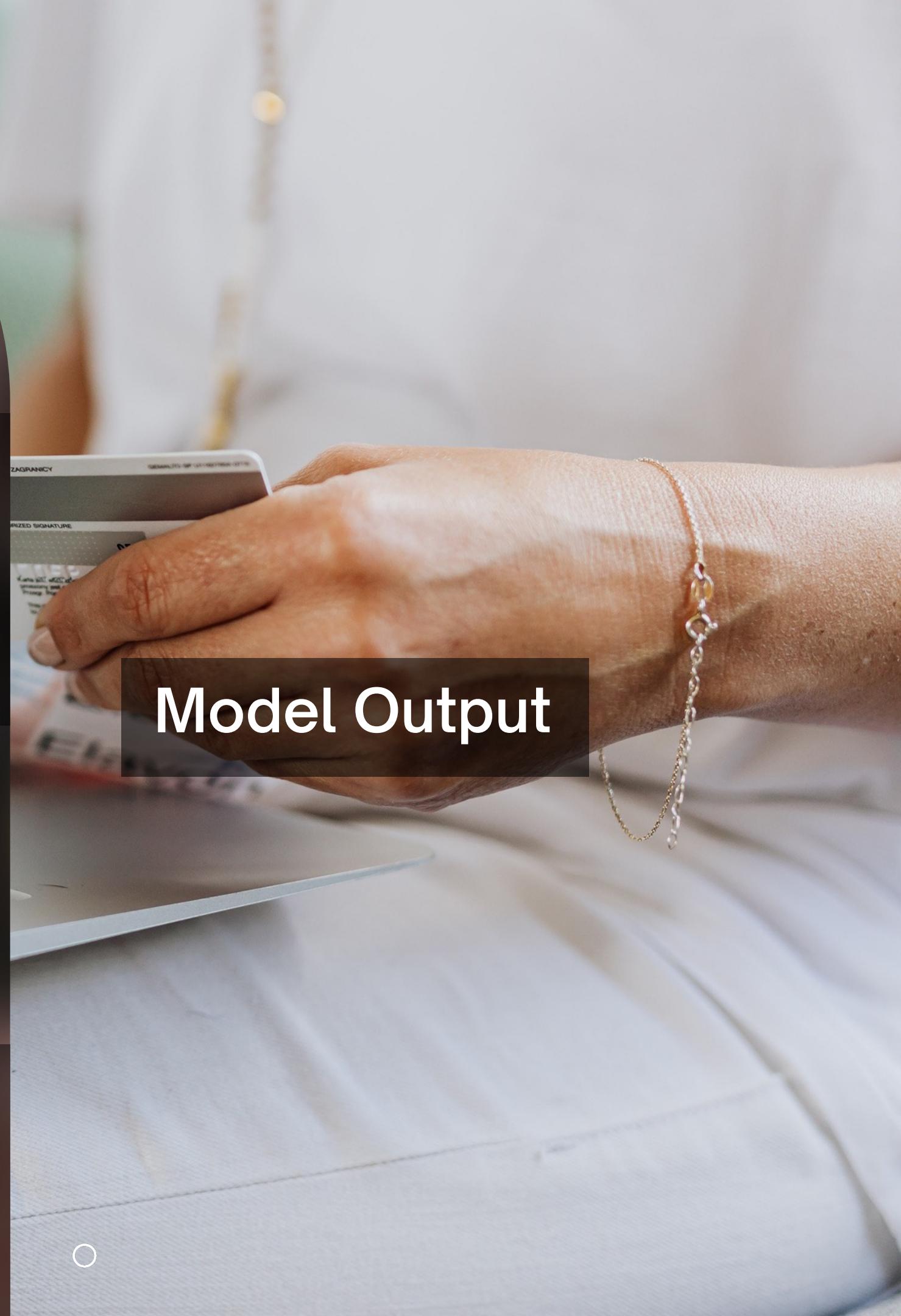
The average APR provided was 23.8%.

Credit Limit

The average line of credit applicants were approved for was \$6,000.

Customer Profile

68% of applicants were female and 32% were male. The average annual income was \$188,000.



Assumptions

With more data...

With a larger dataset, we could determine more segments of the bank's customer base to standardized tiers to further manage and reduce risk.

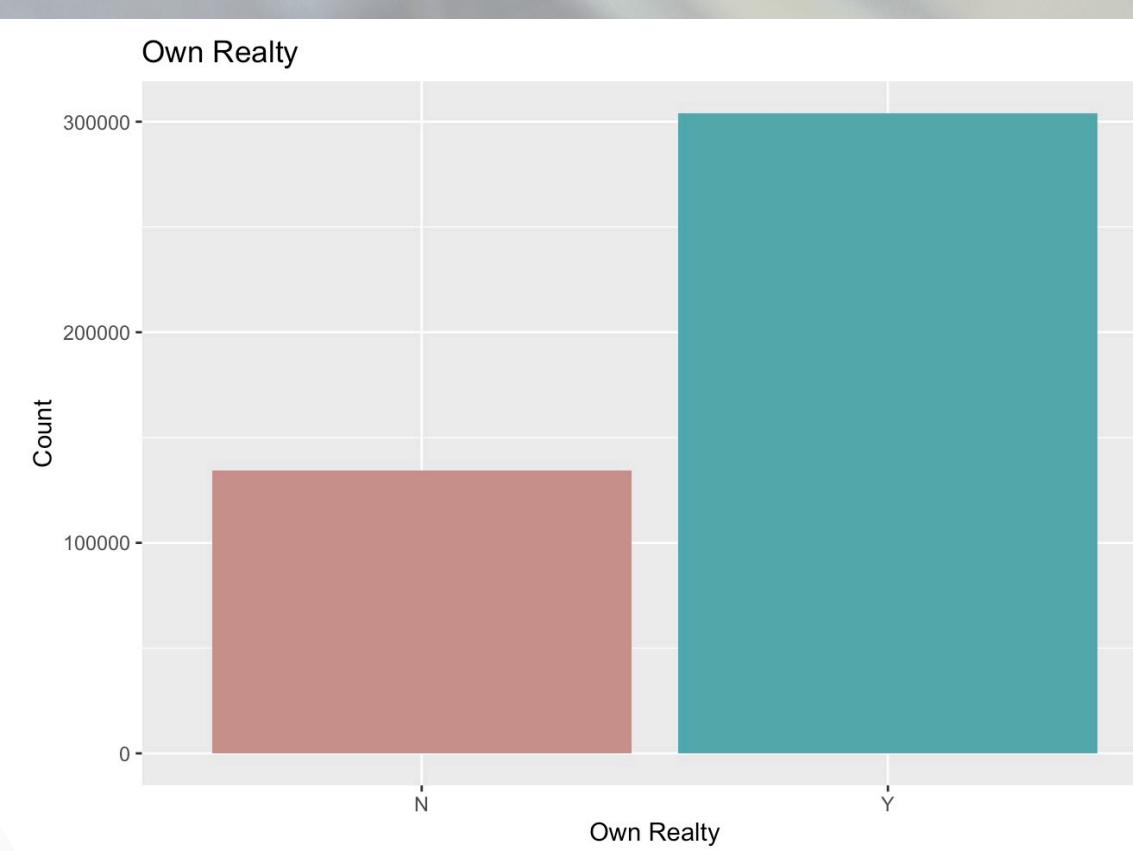
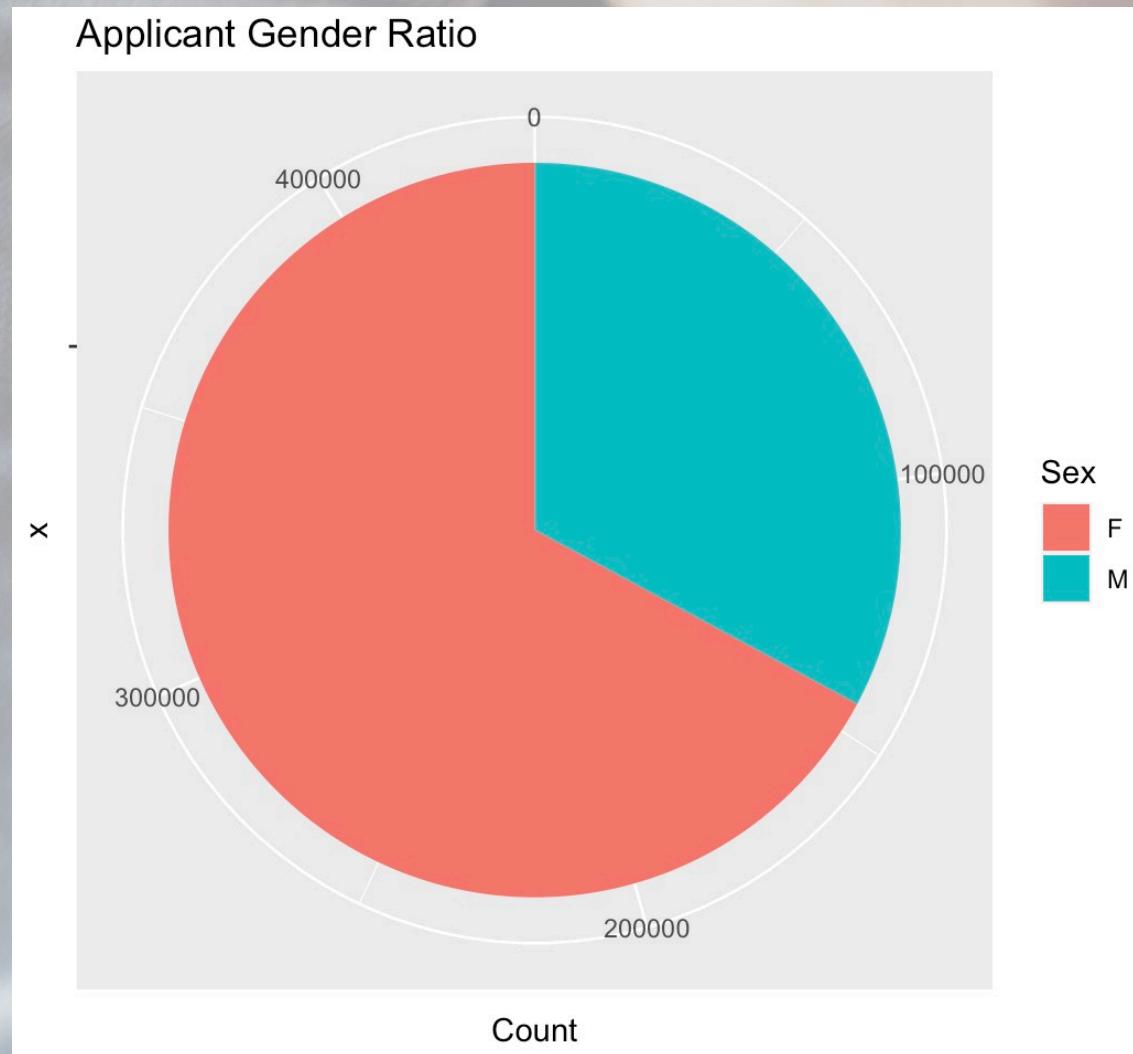
Applicant's credit score would have been helpful.
No sufficient data on all sources of income and assets per applicant. This would allow for better model interpretation.

More details needed on how customers owned their property and the amount of debt reported to credit agencies. It would help to accurately determine debt-to-income ratio.

A close-up photograph of a person's hands holding a large stack of US one-hundred-dollar bills. The hands are positioned as if counting or displaying the money. The background is dark, making the white and green of the dollar bills stand out.

Q & A

Extra References



Column Name	Description
+ "ID"	Application ID number
+ "CODE_GENDER"	Applicant gender (M/F)
+ "FLAG_OWN_CAR"	If the applicant owns a car (Y/N)
+ "FLAG_OWN_REALTY"	If the applicant owns realty (Y/N)
+ "CNT_CHILDREN"	How many children the applicant has
+ "AMT_INCOME_TOTAL"	Applicant's Annual income
+ "NAME_INCOME_TYPE"	Type of employment the applicant has (Student, Working, Pensioner, etc.)
+ "NAME_EDUCATION_TYPE"	Level of education
+ "NAME_FAMILY_STATUS"	Marital status (Single, Married, Widowed, etc.)
+ "NAME_HOUSING_TYPE"	Type of housing the applicant lives in (House, Apartment, With Parents, etc.)
+ "Age"	Age of the applicant
+ "DAYS_EMPLOYED"	How long the applicant has been employed
+ "FLAG_MOBIL"	If the applicant owns a mobile phone
+ "FLAG_WORK_PHONE"	If the applicant owns a work/company phone
+ "FLAG_EMAIL"	If the applicant owns a work/company phone
+ "OCCUPATION_TYPE"	If the applicant owns an email address
+ "CNT_FAM_MEMBERS"	How many individuals live in the household

Annual Income	Points Awarded
< Tier 1	0
Tier 1	12.5
Tier 2	25
Tier 3	37.5
Tier 4	50

Own Car	Points Awarded
Yes	5
No	2.5
No Car	0

NumChildren	Points Awarded
0	10
1	9
2	8
3	7
4-6	5
7-10	3
10+	1

House Type	House TypePts	Own/Rent	Own/RentPts	Total Points Awarded
House / apartment	25	Own	10	35
Rented apartment	25	Own	10	35
Office apartment	25	Own	10	35
Co-op apartment	25	Own	10	35
With parents	25	Own	7	32
Municipal apartment	25	Own	4	29
Co-op apartment	20	Rent	6	26
House / apartment	12.5	Rent	7	19.5
Rented apartment	12.5	Rent	6	18.5
With parents	12.5	Rent	5	17.5
Office apartment	12.5	Rent	5	17.5
Municipal apartment	12.5	Rent	4	16.5
None	0	NA	0	0