

Project 1: Group 12

Project Team:

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Project: Dataset | Introduction & Inspiration

Dataset:

Financial Transactions Dataset: Analytics

<https://www.kaggle.com/datasets/computingvictor/transactions-fraud-datasets/code>

Introduction:

The “Financial Transactions Dataset: Analytics,” contains financial payment card and card holder demographic information from 2010 through 2019.

Objectives

Explore financial health on how it varies with:

- Select demographics
- Individual financial attributes
- Geographic regions

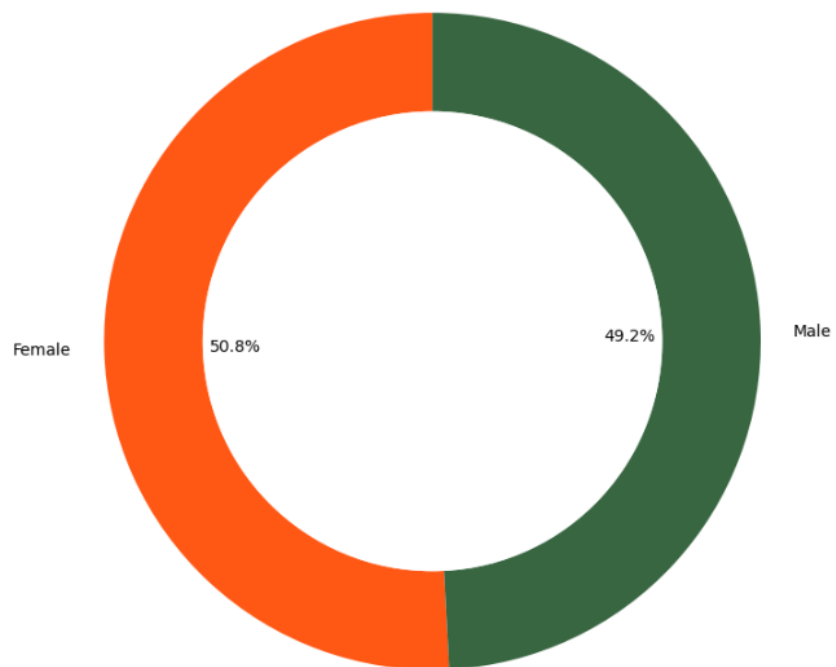
Analyze the correlations between the above characteristics and established measurement of financial health, know as the total debt-to-income (DTI) ratio

Customer Demographics

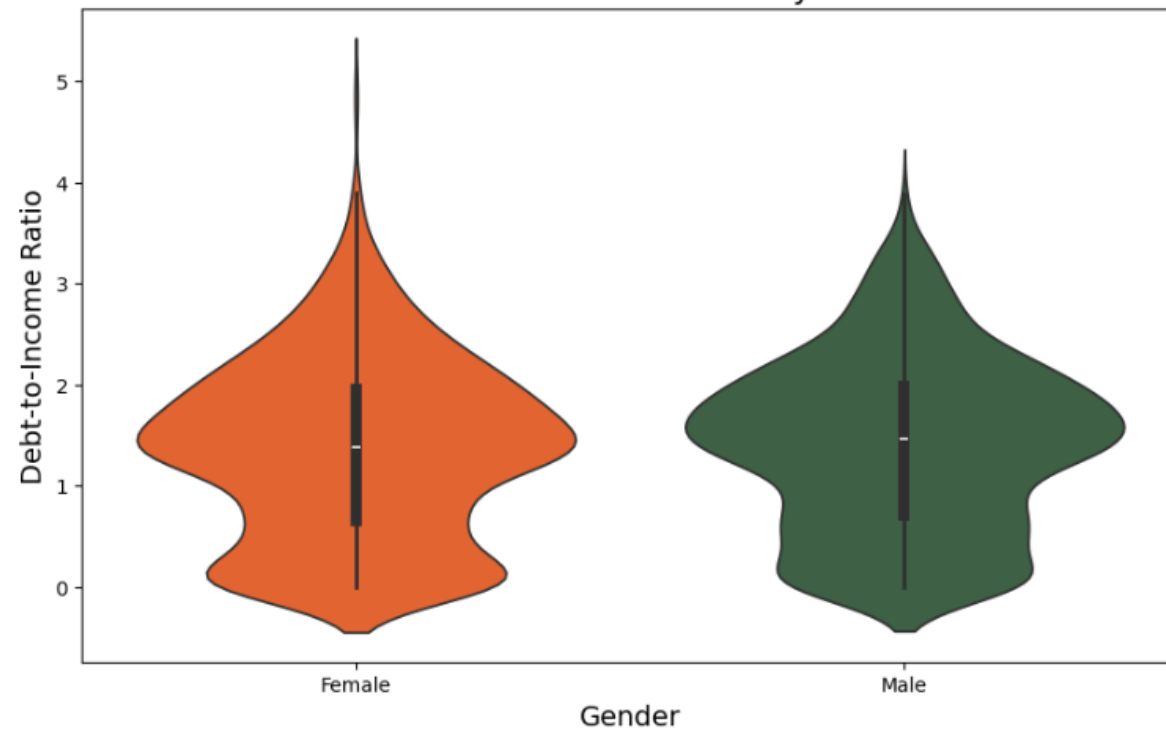
QUESTION 1: How do customer demographics (e.g., age, gender, income) correlate with customer financial health?

client_id	current_age	birth_year	birth_month	gender	yearly_income
825	53	1966	11	Female	59696
1746	53	1966	12	Female	77254
1718	81	1938	11	Female	33483
708	63	1957	1	Female	249925
1164	43	1976	9	Male	109687
68	42	1977	10	Male	41997
1075	36	1983	12	Female	51500
1711	26	1993	12	Male	54623
1116	81	1938	7	Female	42509
1752	34	1986	1	Female	38190
192	27	1992	6	Male	56164
640	29	1990	9	Female	45727
1679	18	2002	1	Female	69149
1094	34	1985	10	Male	41442
1590	48	1971	5	Female	20513
1660	41	1978	4	Female	23123
1747	54	1966	1	Male	36497

Gender Distribution



Debt-to-Income Distribution by Gender

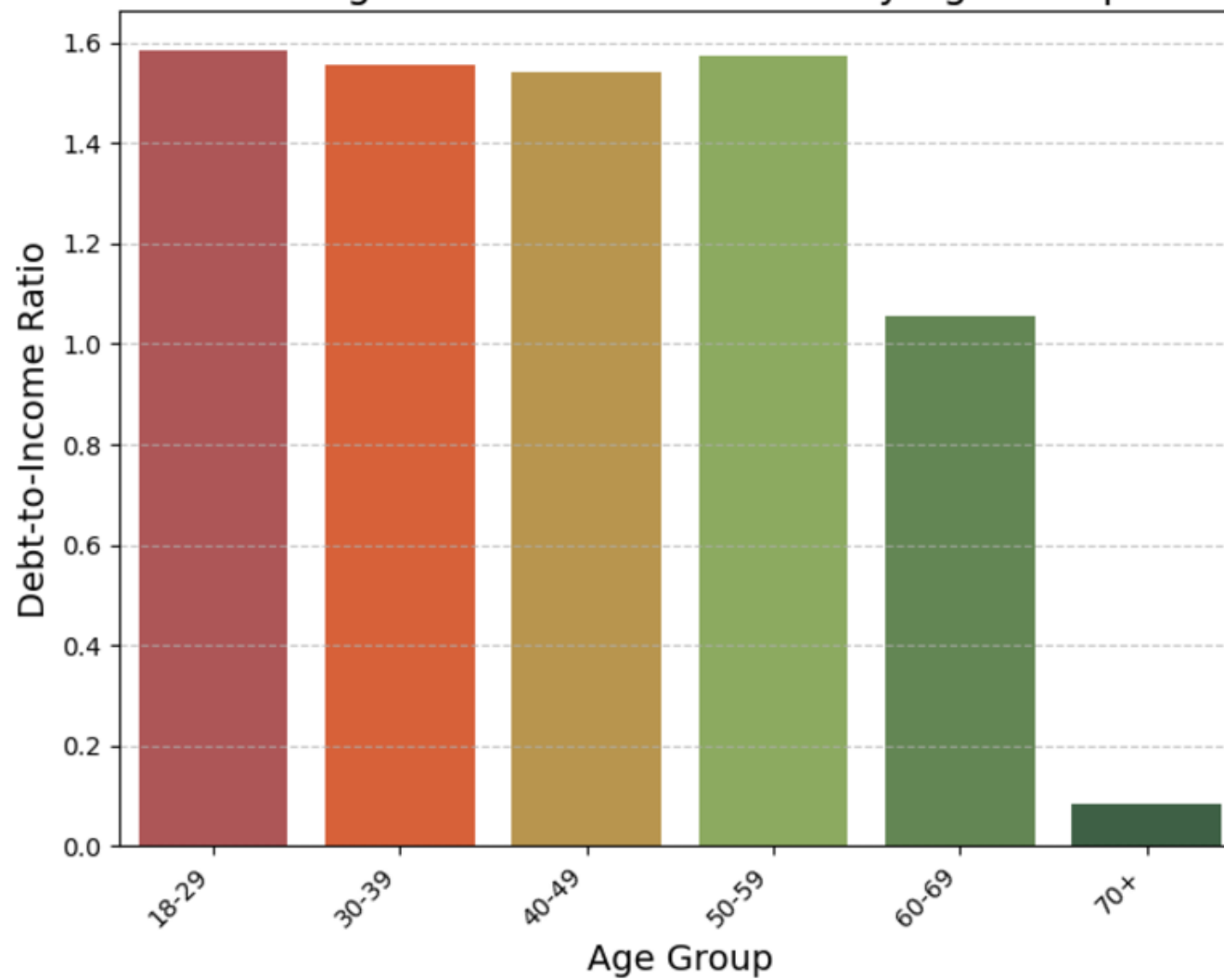


T-statistic: 0.9904944979315766

P-value: 0.32205760966566954

There is no significant difference between male and female debt-to-income ratios.

Average Debt-to-Income Ratio by Age Group

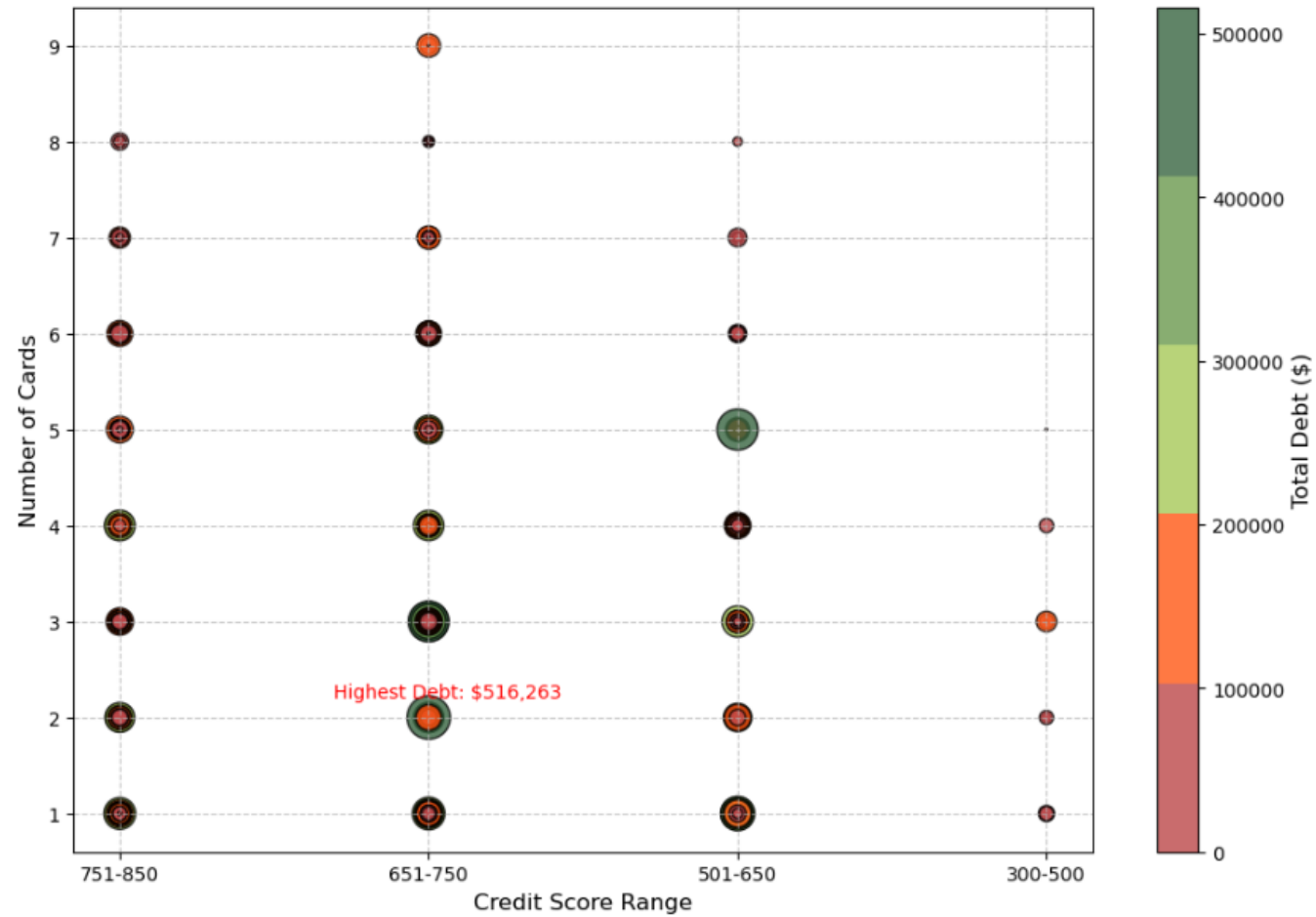


Financial Attributes

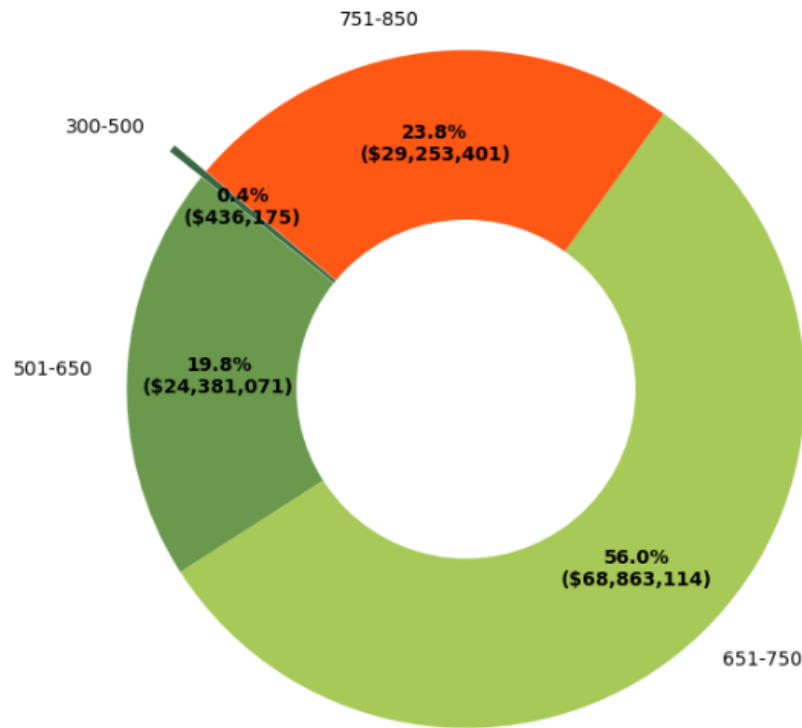
QUESTION 2: How do financial attributes (e.g., card count, credit score, total debt) correlate with customer financial health?

client_id	total_debt	credit_score	num_credit_cards
825	127613	787	5
1746	191349	701	5
1718	196	698	5
708	202328	722	4
1164	183855	675	1
68	0	704	3
1075	102286	672	3
1711	114711	728	1
1116	2895	755	5
1752	81262	810	1
192	15224	761	2
640	94016	629	1
1679	89214	776	1

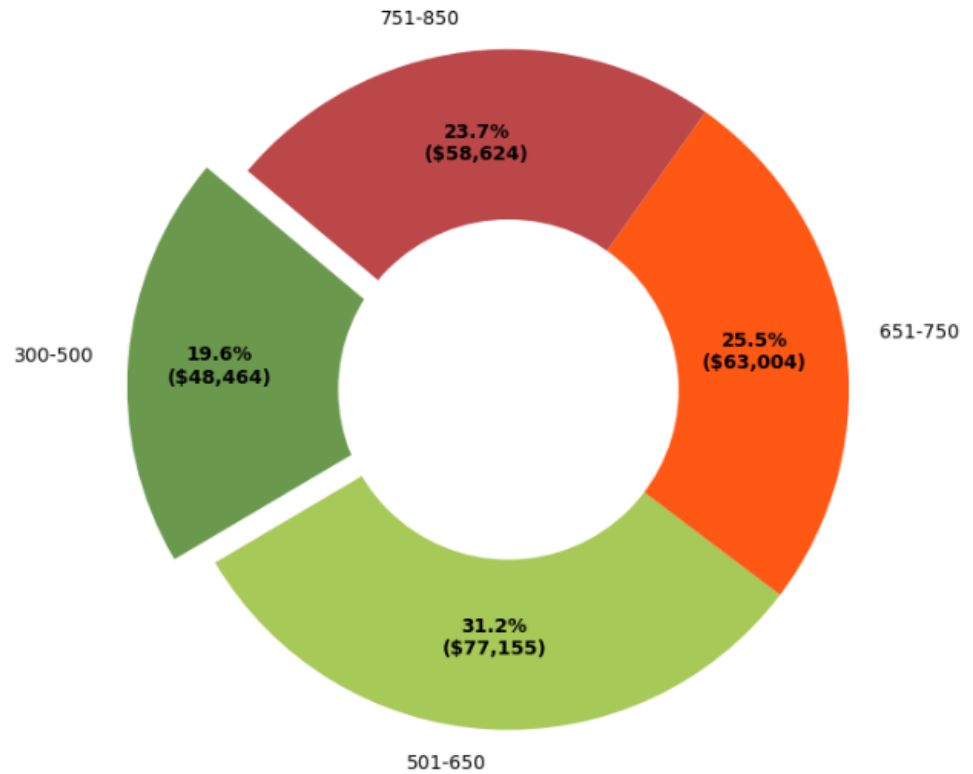
**Number of Cards by Credit Score Range
(Color and Size Indicate Total Debt)**



Breakdown of Total Debt by Credit Score Categories



Breakdown of Average Debt by Credit Score Categories

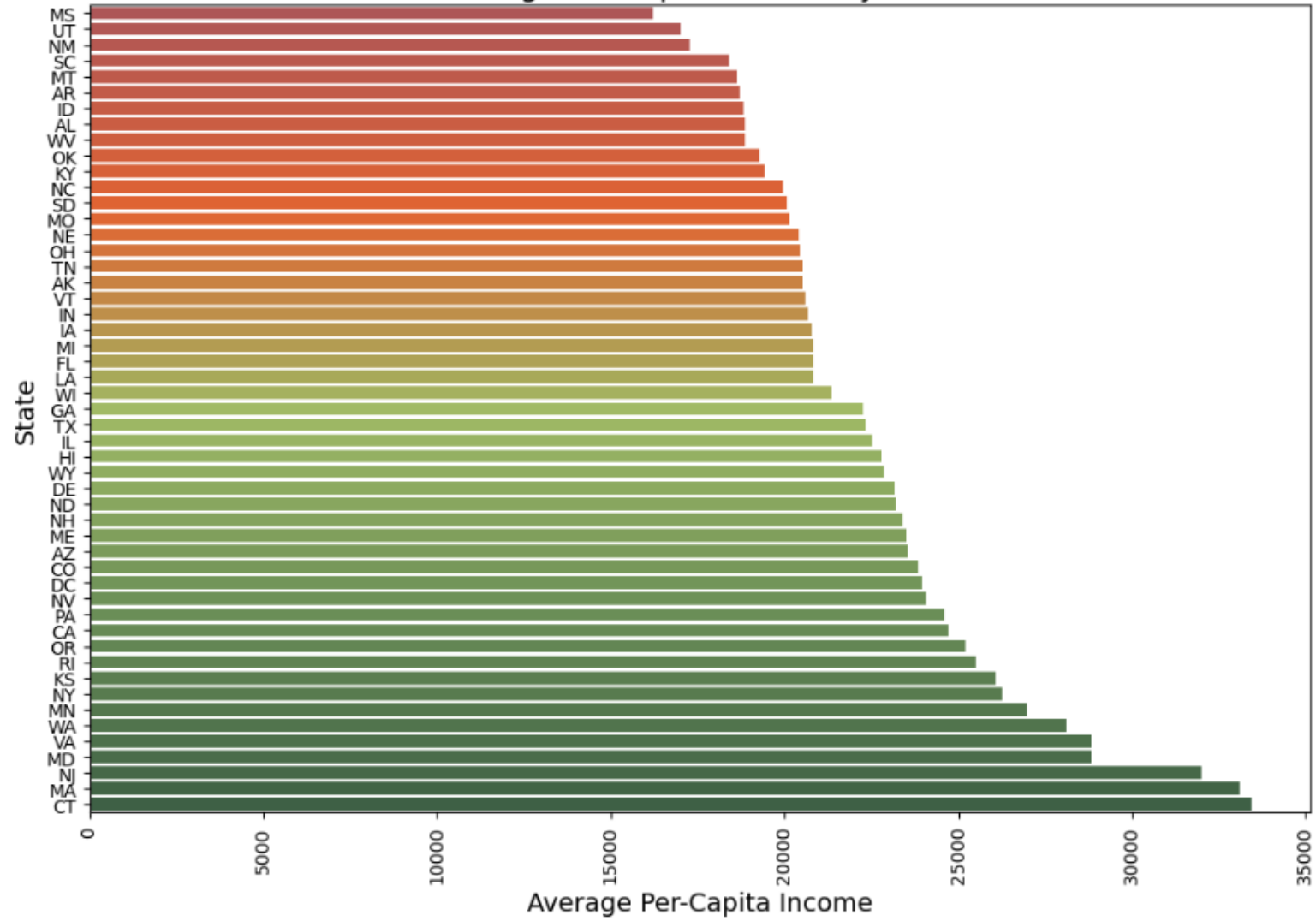


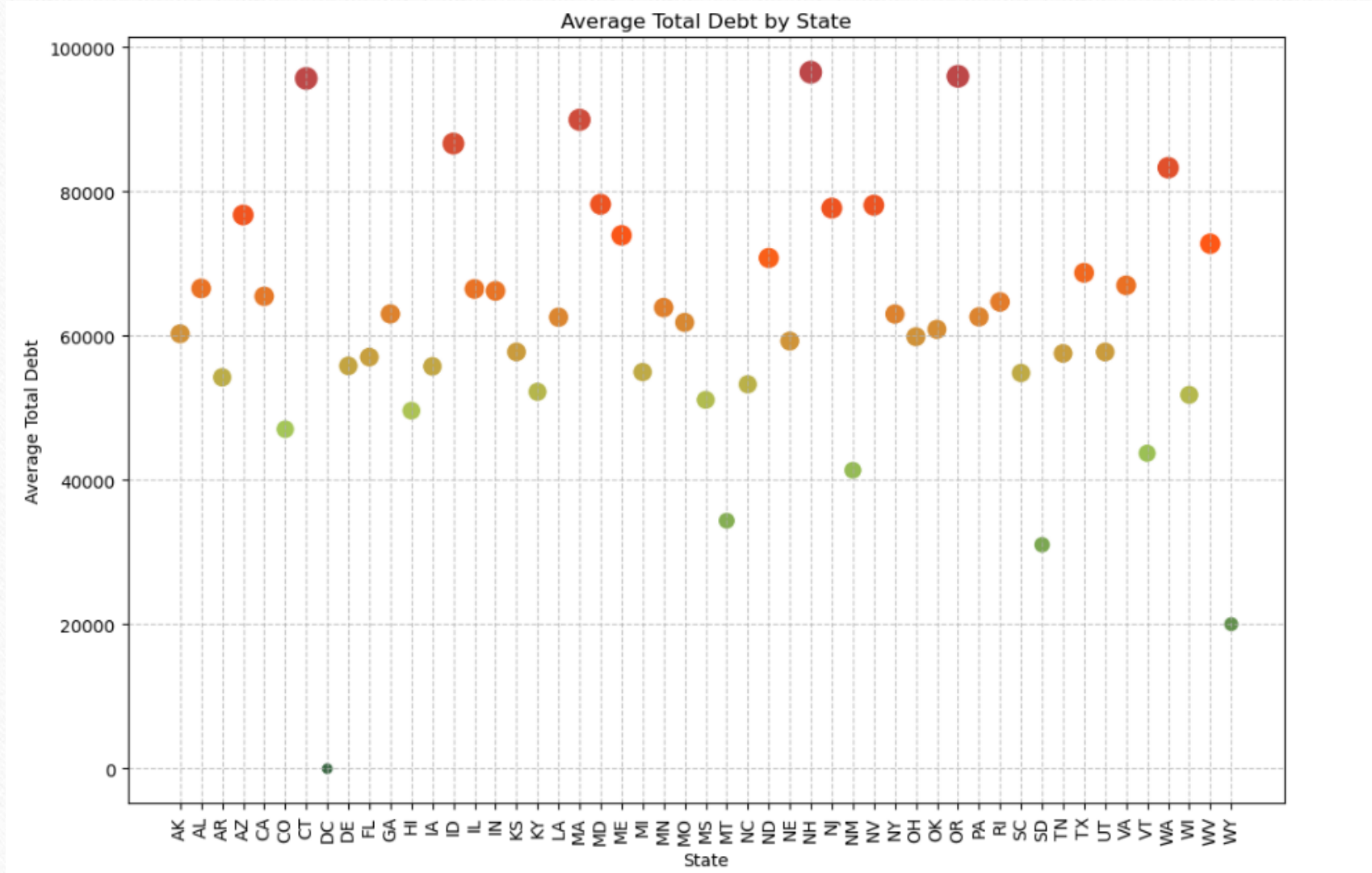
Geographic Information

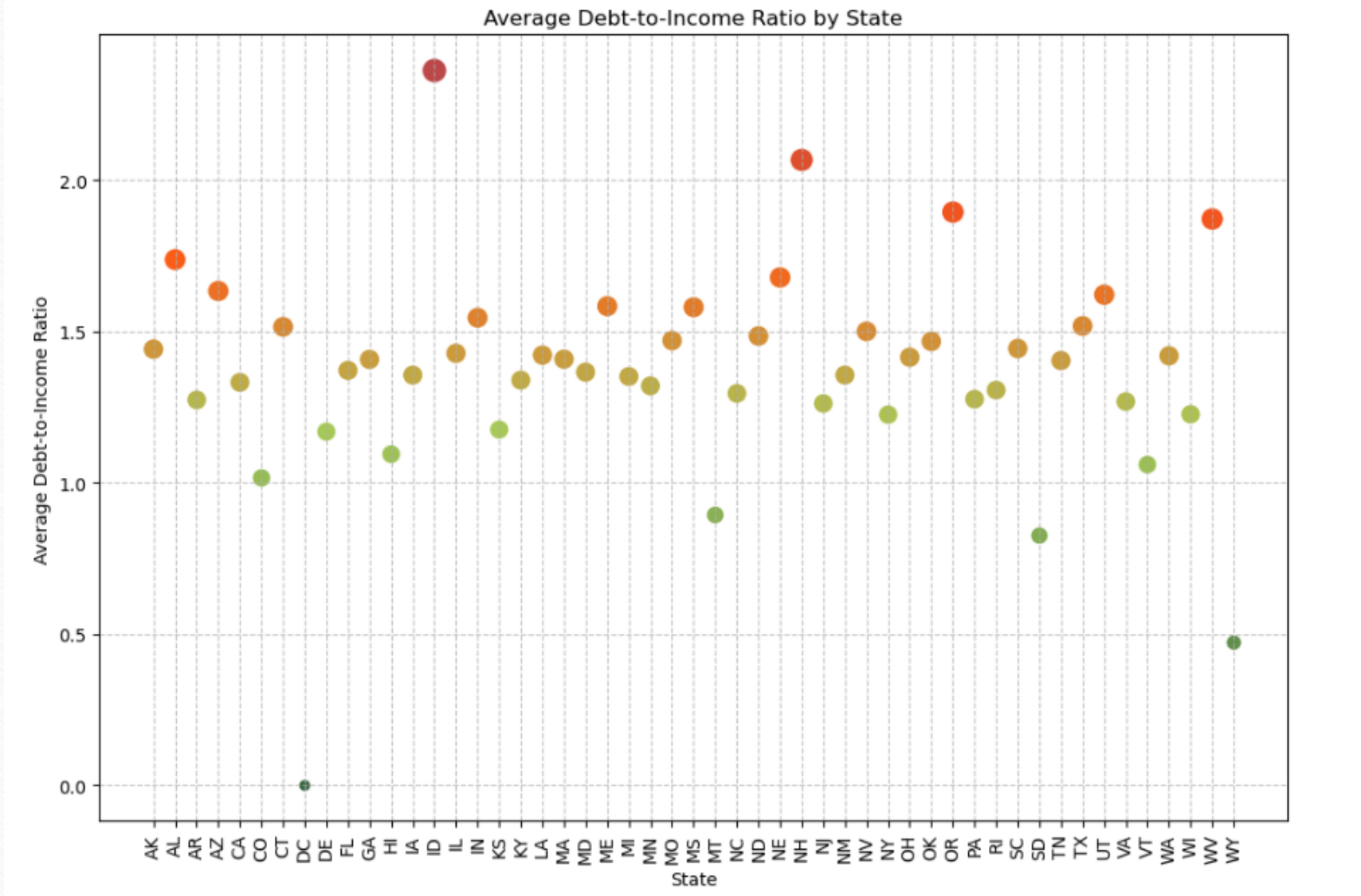
QUESTION 3: How does customer geographic information (e.g. state, city, per capita income) correlate with customer financial health?

client_id	address	state	latitude	longitude	per_capita_income
825	7481 Brydon Road, La Verne, CA, 91750, United States of America	CA	34.15	-117.76	29278
1746	51-17 Redfield Street, New York, NY, 11362, United States of America	NY	40.76	-73.74	37891
1718	Nogales Street, West Covina, CA, 91792, United States of America	CA	34.02	-117.89	22681
708	Market Slip, New York, NY, 10002, United States of America	NY	40.71	-73.99	163145
1164	24;26 Caselli Avenue, San Francisco, CA, 94114, United States of America	CA	37.76	-122.44	53797
68	entary School, 3029 North Division Street, Davenport, IA, 52804, United States of America	IA	41.55	-90.6	20599
1075	26 Forrest Street, Germantown, Louisville, KY, 40217, United States of America	KY	38.22	-85.74	25258
1711	1818 Southeast 25th Avenue, Portland, OR, 97214, United States of America	OR	45.51	-122.64	26790
1116	2 South Main Street, Telford, Bucks County, PA, 18969, United States of America	PA	40.32	-75.32	26273
1752	235 Rue Alleman, Abbeville, LA, 70510, United States of America	LA	29.97	-92.12	18730
192	701 Hillcrest Avenue, Sacramento County, CA, 95628, United States of America	CA	38.65	-121.25	27548
640	1207 38th Avenue, Greeley, CO, 80634, United States of America	CO	40.42	-104.74	22427
1679	1295, Cranston, RI, 02920, United States of America	RI	41.76	-71.48	33914

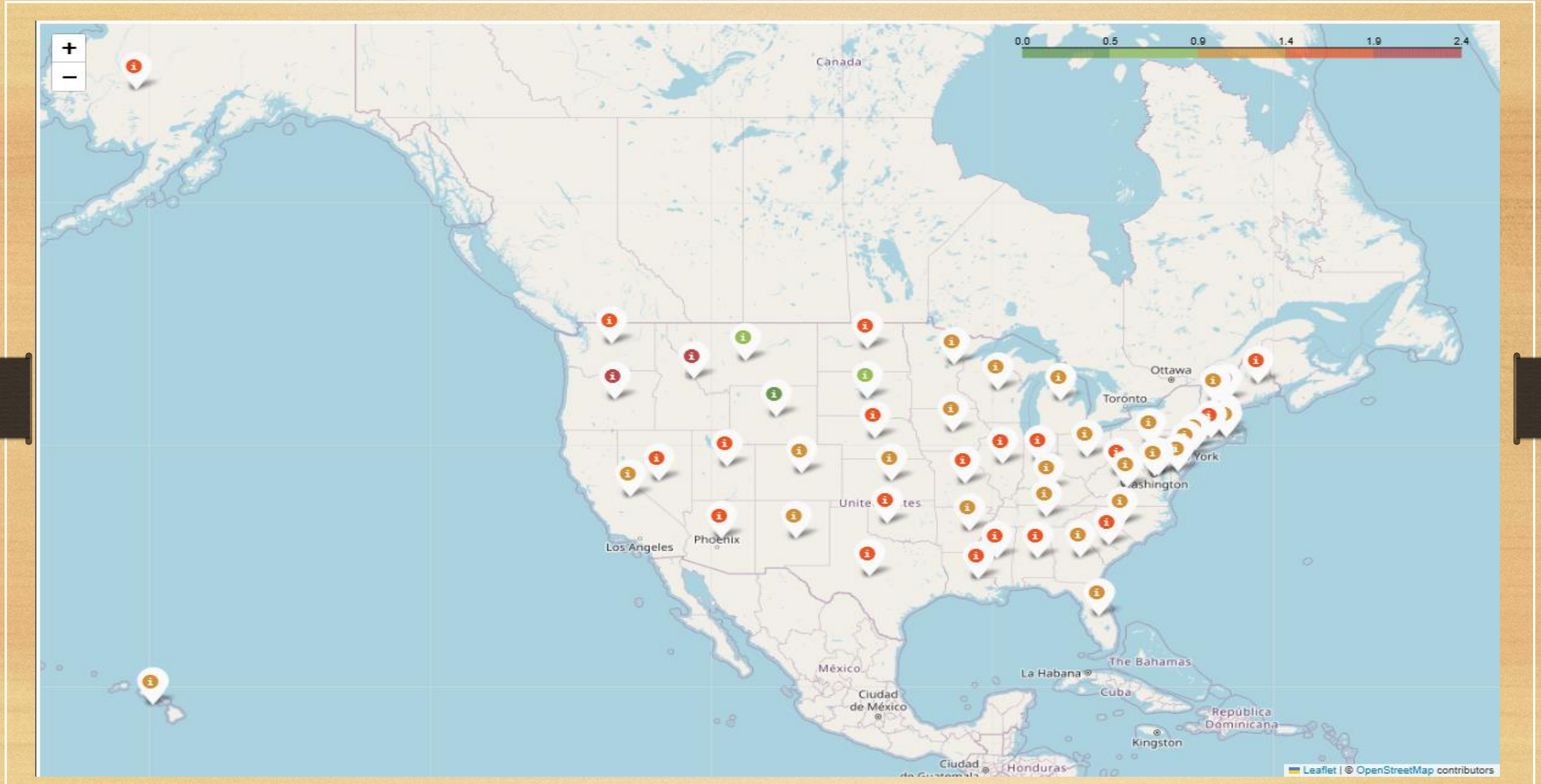
Average Per-Capita Income by State







Average Debt-to-Income (DTI) by State



Bias and Limitations

Limitations:

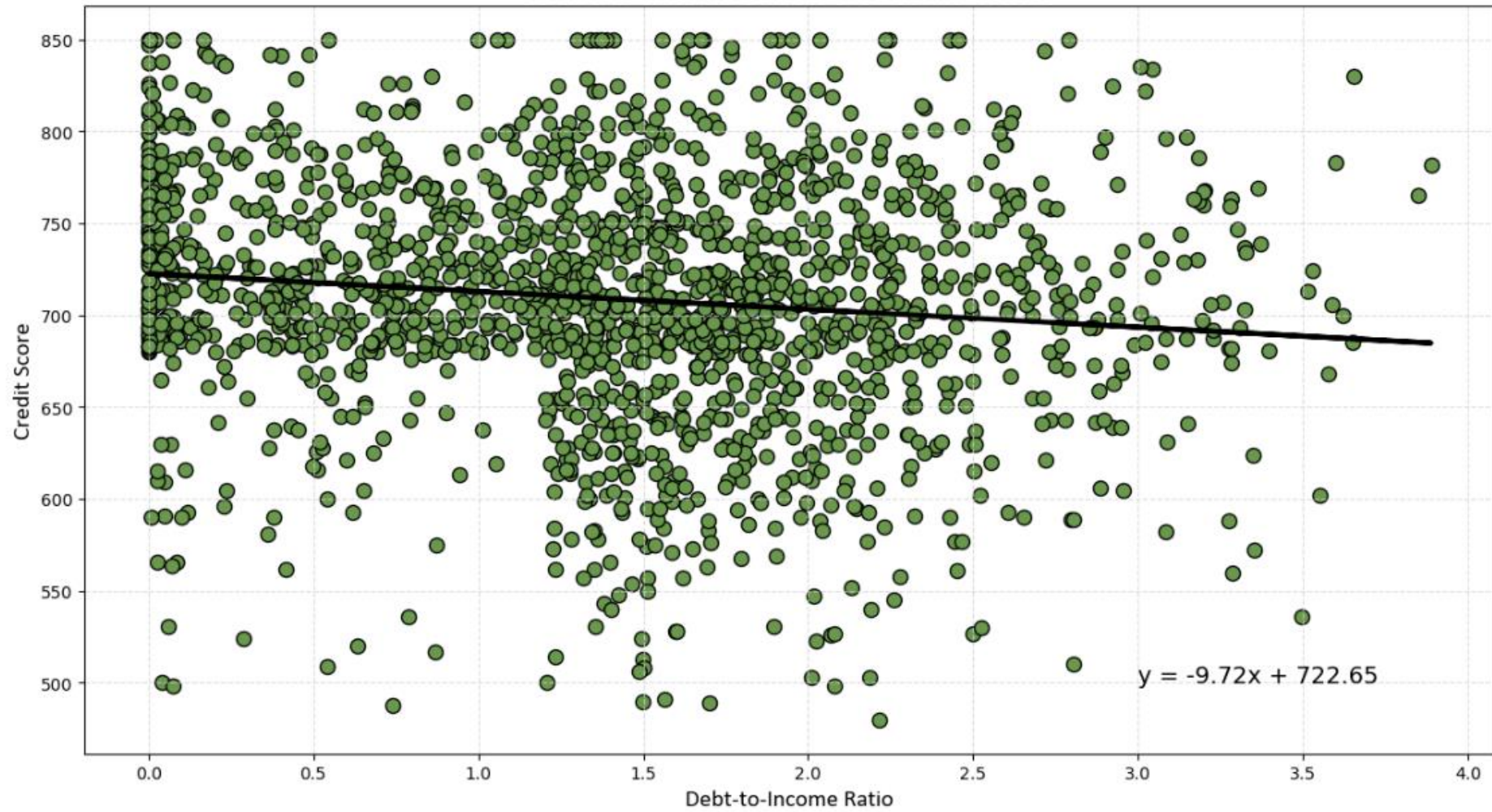
- Fictitious data – Use for exercise
- Some states had very small sample size

Bias:

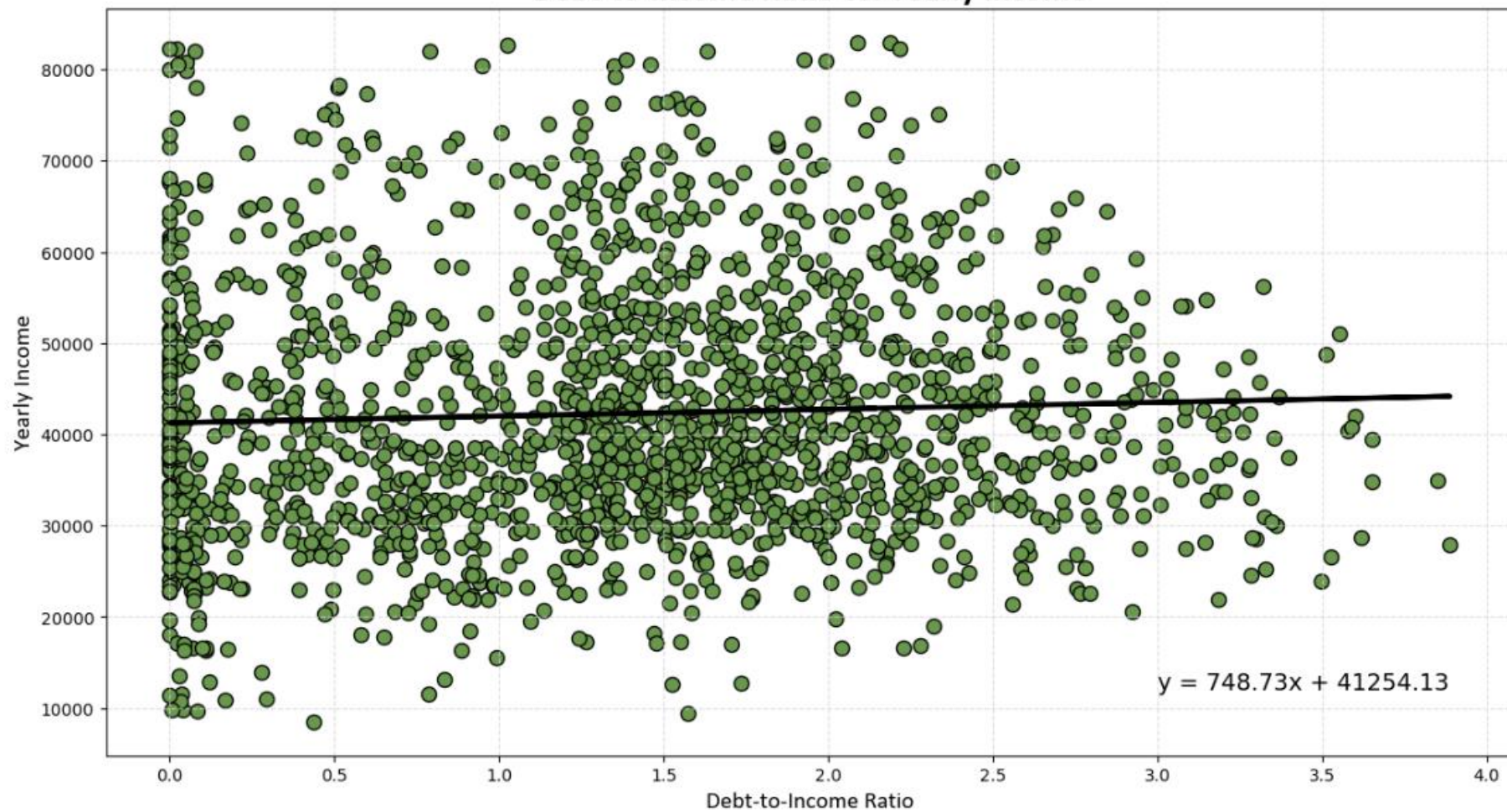
- Distribution of Male(49.2%)to Female (50.8%)
 - Wasn't a 50/50 split but is Reflective of US Population
- # of outliers impacted 'gold standard of measurement' (e.g. Age, State, DTI Ratio)
 - Removed outliers in total debt and yearly income to ensure that the DTI was smoothed out
 - May have unintentionally created bias by being selective of the outliers we removed

Regression Analysis

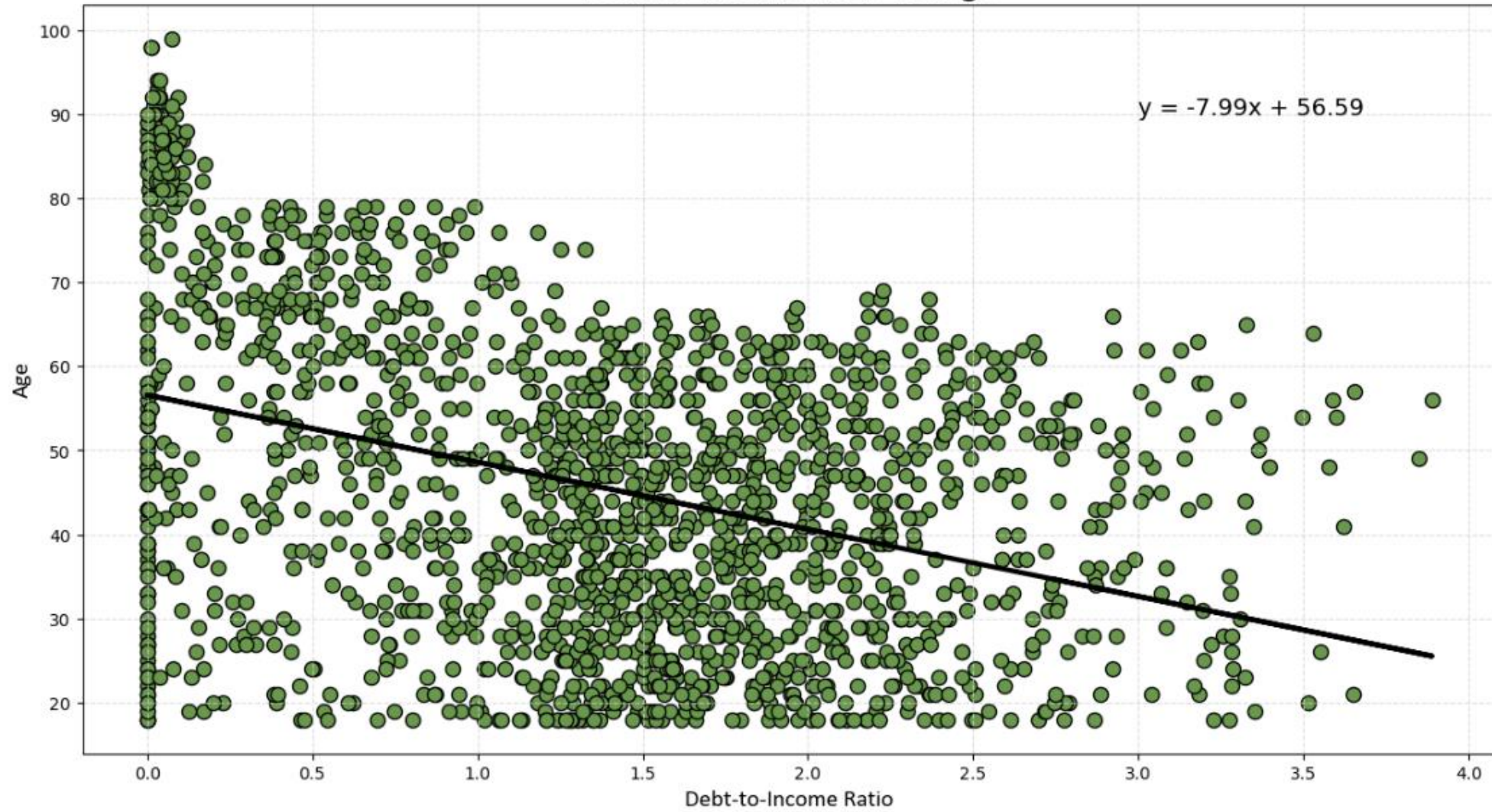
Debt-to-Income Ratio vs. Credit Score



Debt-to-Income Ratio vs. Yearly Income



Debt-to-Income Ratio vs. Age



Conclusion | Final Thoughts

Debt-to-Income (DTI) ratio impact:

- Credit Score
 - Yearly Income
 - Age
-
- The only correlation that exists is between DTI and Age
 - As you mature in life your debt-to-income ratio lower, doesn't matter income, credit score
 - Expected to see that the lower the income the higher the debt-to-ratio

Thank You!

Works Cited

Financial Transactions Dataset: Analytics

<https://www.kaggle.com/datasets/computingvictor/transactions-fraud-datasets/code>

Kaggle: Introduction to Folium

<https://www.kaggle.com/code/imdevskp/folium>

ChatGPT – Python AI Assistance

<https://chatgpt.com/>