CAPITAL PUNISHMENT AND ITS RELATIONSHIP WITH CRIME

(THE MARSHALL PROJECT, 2017)

DSC 530 - 10.4 ASSIGNMENT TERM PROJECT

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Capital Punishment and its Intended Effects

Capital punishment has a few objectives that is believed that will result in the improvement of society (Fieser, 2017). They are:

1. Retribution – intended to punish the criminal.
2. Incapacitation – intended to physically render the criminal able to duplicate their actions.
3. Deterrence – intended to discourage others from engaging in these same or similar actions.

This project will evaluate the effectiveness of the third objective, deterrence.

The question this presentation asks is:

"Do states with the death penalty see less crime than states without the death penalty?

H_0: LEGAL(Y) = LEGAL(N) H_A: LEGAL(Y) ≠ LEGAL(N)

How do I answer this question?

There are a number of steps taken to answer this question:

1. In order to understand the scope of the nature of the different variables, descriptive statistics are taken. These variables are also visualized in the form of histograms. Correlation analysis is mapped out to understand how different variables relate to one another. Scatter plots are also posted with regression analyses to understand how certain crimes increase or decrease throughout the years and at what rate.
2. In order to test these crimes, independent t tests are done throughout all variables. Alpha, and t critical levels are ascertained. t obtained and p-values are calculated throughout examination and graphed by box and whisker plots.

VARIABLES UTILIZED FOR TESTING

1. **REPORT_YEAR (YEAR)** – THE YEAR RECORDED BETWEEN 1975 TO 2015.
2. **STATE** – A CREATED VARIABLE WHICH DETERMINES WHERE DATA COMES FROM.
3. **ASSAULTS_PERCAPITA (APC)** – HOW MANY ASSAULTS REPORTED PER 100,000 PEOPLE.
4. **CRIMES PER CAPITA (CPC)** - HOW MUCH CRIME REPORTED PER 100,000 PEOPLE.
5. **HOMICIDES_PERCAPITA (HPC)** – HOW MANY HOMICIDES REPORTED PER 100,000 PEOPLE.
6. **RAPES PER_CAPITA (RAPC)** – HOW MANY RAPES REPORTED PER 100,000 PEOPLE.
7. **ROBBERIES PER_CAPITA (ROPC)** – HOW MANY ROBBERIES REPORTED PER 100,000 PEOPLE.
8. **LEGAL?** – THIS CREATED VARIABLE CROSS REFERENCES *REPORT_YEAR* TO *AGENCY_JURISDICTION*. IF CAPITAL PUNISHMENT APPLIES IN *STATE* THEN, *LEGAL?* WILL BE REPRESENTED AS T (TRUE). OTHERWISE, IT WILL APPEAR AS F (FALSE).

CAPITAL PUNISHMENT LEGALITY

PRIOR TO THE START OF THE DATA SET, CAPITAL PUNISHMENT WAS ABOLISHED NATIONWIDE AS A RESULT OF FURMAN V. GEORGIA (FURMAN V. GEORGIA, N.D). CAPITAL PUNISHMENT ONLY RESUMED IN 1976, AS A RESULT OF GREGG V. GEORGIA (GREGG V. GEORGIA, N.D).

AS A RESULT, ALL STATES AT THE BEGINNING OF THE TIMELINE ARE TO BE CONSIDERED NOT TO HAVE THE DEATH PENALTY UNTIL STATE LEGISLATURE HAS RULED OTHERWISE.

THE FOLLOWING STATES ALWAYS HAD THE DEATH PENALTY DURING 1975-2015:

ARIZONA, CALIFORNIA, DELAWARE, FLORIDA, GEORGIA, IDAHO, INDIANA, KENTUCKY, LOUISIANA, MISSOURI, MONTANA, NEVADA, OKLAHOMA, PENNSYLVANIA, SOUTH CAROLINA, TENNESSEE, TEXAS, UTAH, VIRGINIA

CAPITAL PUNISHMENT LEGALITY PART TWO

THE FOLLOWING STATES NEVER HAD THE DEATH PENALTY DURING 1975-2015:

ALASKA, FLORIDA, IOWA, MICHIGAN, MINNESOTA, NORTH DAKOTA, VERMONT, WEST VIRGINIA, WISCONSIN, DISTRICT OF COLUMBIA

THE FOLLOWING STATES HAD CAPITAL PUNISHMENT ONLY DURING SPECIFIED TIME FRAMES

ALABAMA: SINCE 1976 -- **ILLINOIS:** BETWEEN 1977-2011 -- **MARYLAND:** BETWEEN 1978-2013

MASSACHUSETTS: BETWEEN 1982-1984 -- **MISSISSIPPI:** SINCE 1976 –

NEW HAMPSHIRE: BETWEEN 1991-2019 -- **NEW JERSEY:** BETWEEN 1982-2007

NEBRASKA: 1976-2008, 2009-2015, 2016- -- **NEW MEXICO:** BETWEEN 1979-2009

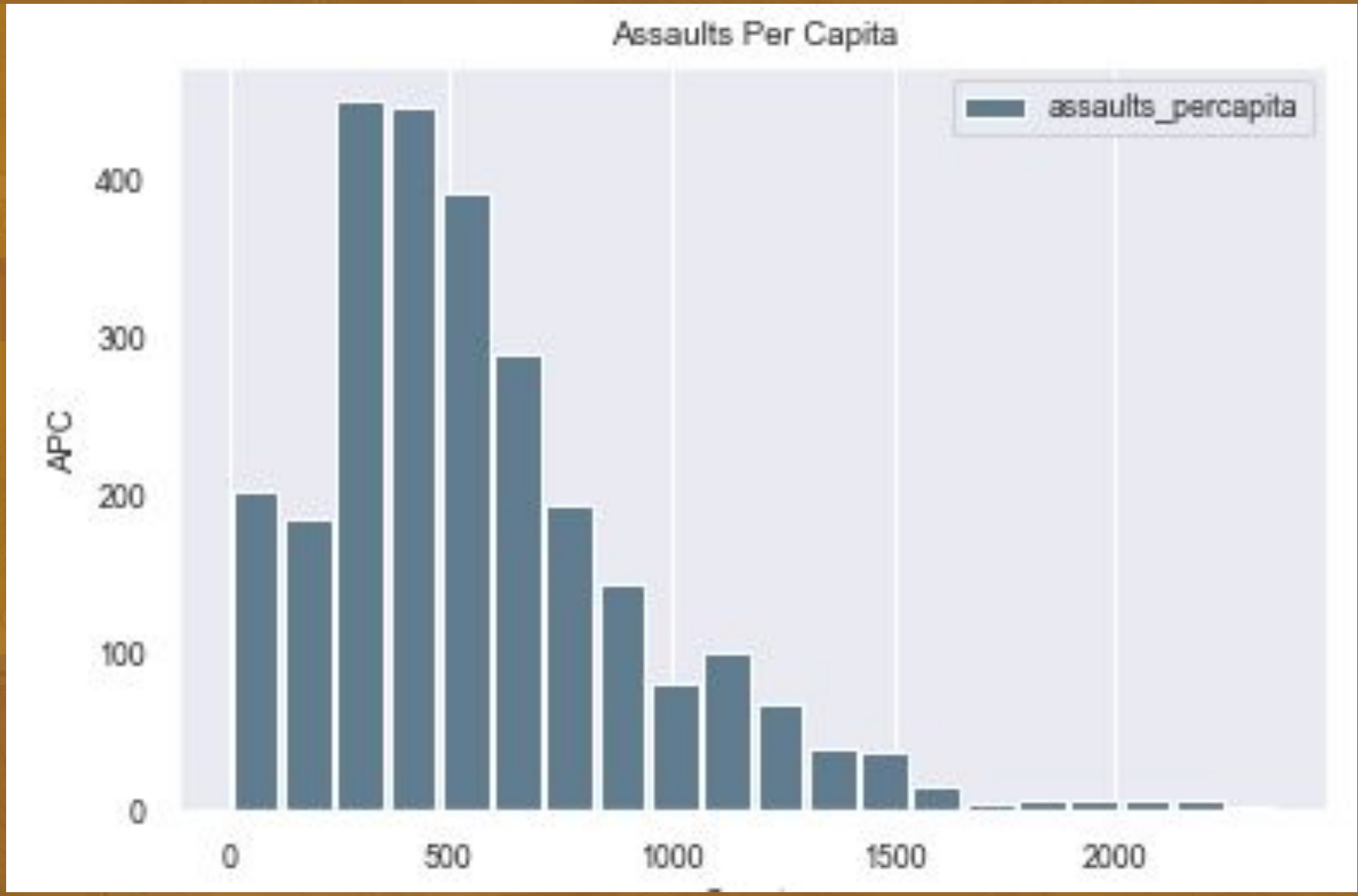
NORTH CAROLINA: SINCE 1977 -- **NEW YORK:** BETWEEN 1975-1984, 1995-2007

OHIO: 1975-1978, 1981- -- **OREGON:** 1978-1981, 1984- **-- RHODE ISLAND:** BETWEEN 1976-1984

SOUTH DAKOTA: SINCE 1979 -- **WASHINGTON:** BETWEEN 1976-2018 -- **WYOMING:** SINCE 1977

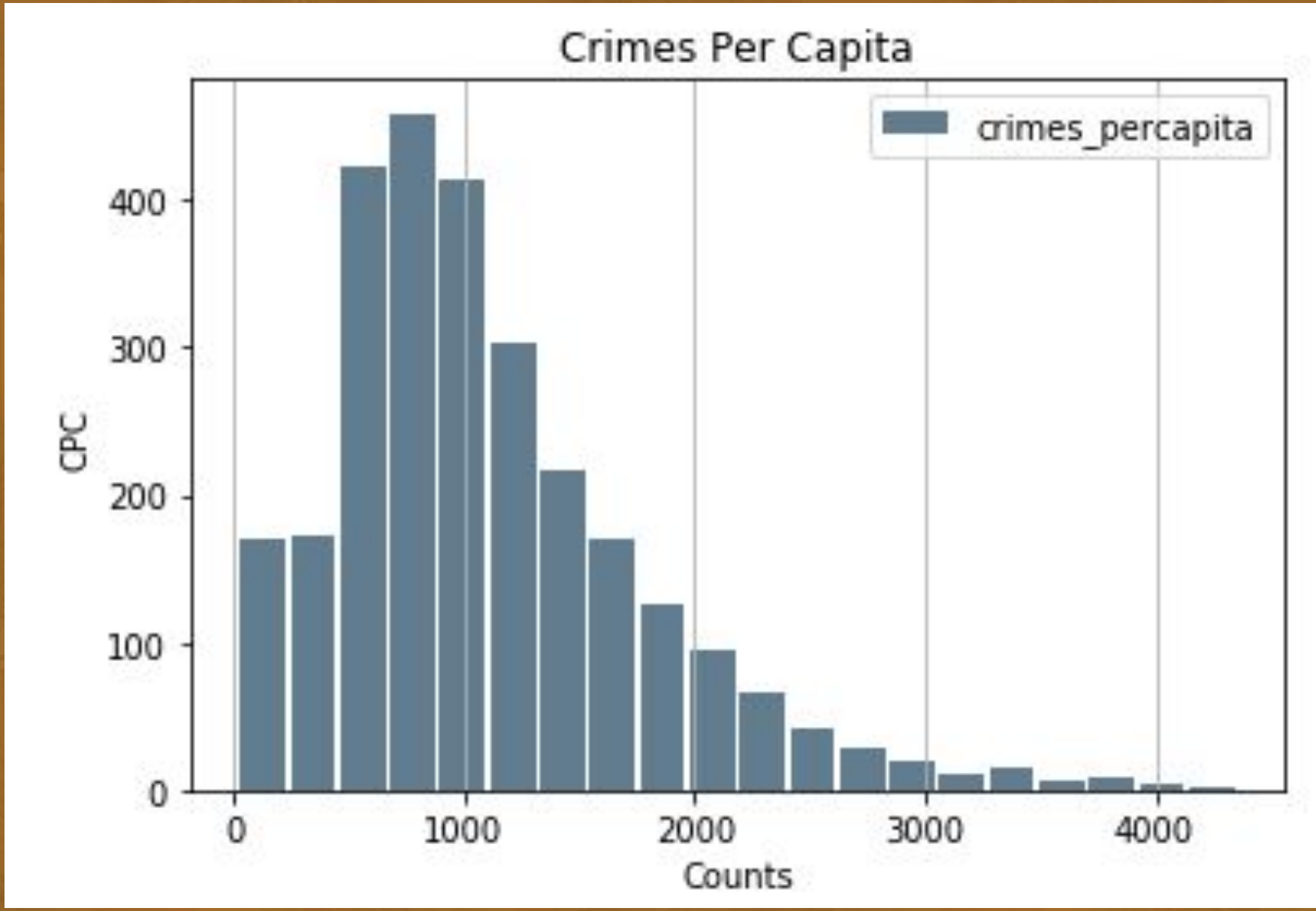
ASSAULT HISTOGRAM

THE HISTOGRAM FOR THE ASSAULT VARIABLE GENERALLY FITS A LOGNORMAL DISTRIBUTION. ITS MEAN HOVERS JUST BELOW THE 500 MARK WITH A LONG RIGHT-SIDE TAIL.



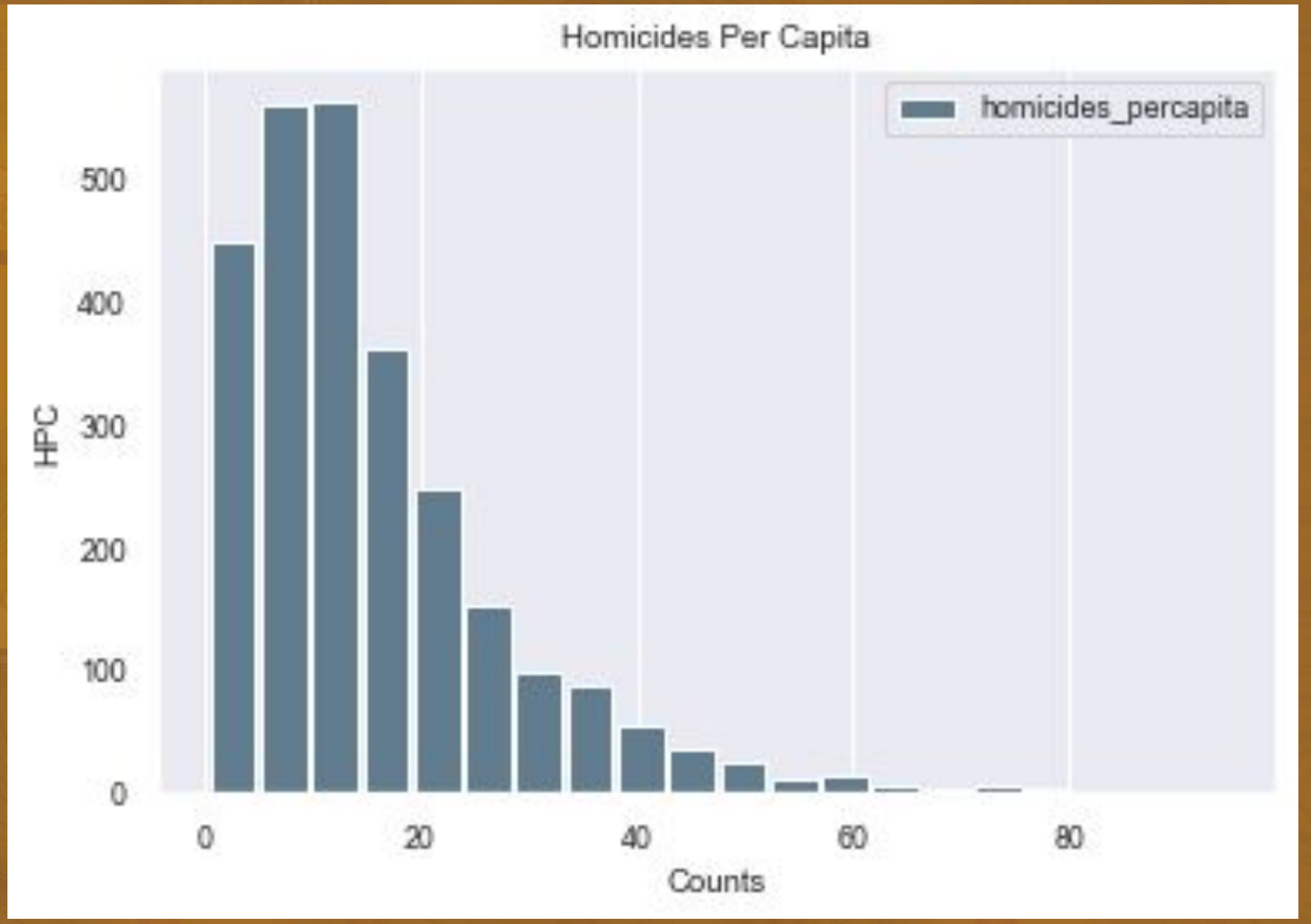
GENERAL CRIME HISTOGRAM

THE HISTOGRAM FOR THE CRIME VARIABLE GENERALLY FITS A LOGNORMAL DISTRIBUTION. ITS MEAN HOVERS JUST BELOW THE 1,000 MARK WITH A LONG RIGHT-SIDE TAIL.



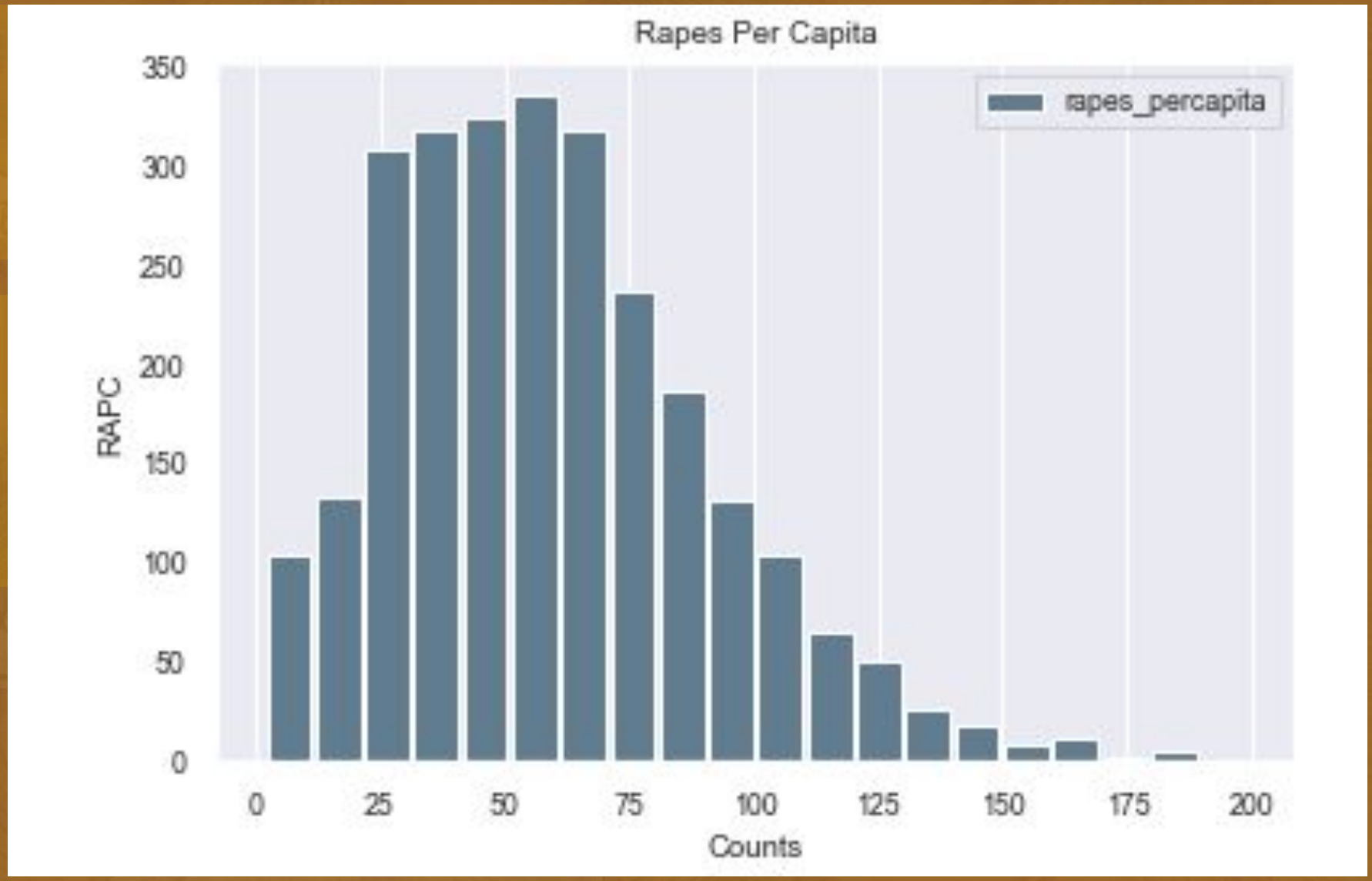
HOMICIDE HISTOGRAM

THE HISTOGRAM FOR THE HOMICIDE VARIABLE FITS A LITTLE DIFFERENTLY THAN THE OTHER CRIME VARIABLES. WHILE IT SOMEWHAT RESEMBLES A LOGNORMAL DISTRIBUTION, THE NEAR-LACK OF TAIL ALMOST APPEARS TO BE A PRIMARILY NEGATIVE-SKEWED DISTRIBUTION.



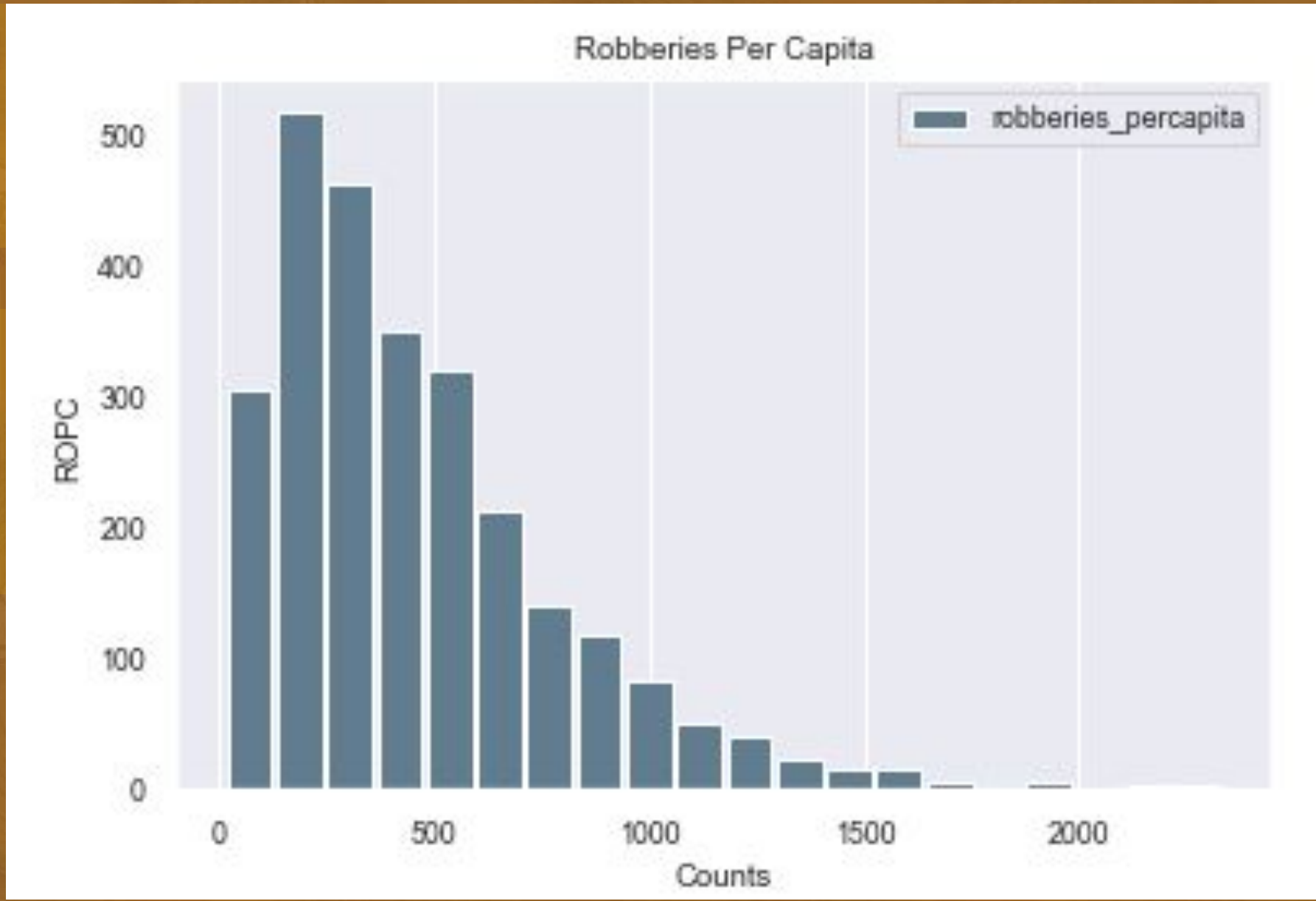
RAPE HISTOGRAM

THE HISTOGRAM FOR THE RAPE, LIKE THE OTHERS, RESEMBLE A LOGNORMAL DISTRIBUTION, BUT THE TAIL ON THE LEFT BEGINS TO APPROXIMATE TOWARD A NORMAL DISTRIBUTION.



ROBBERY HISTOGRAM

THE HISTOGRAM FOR THE ROBBERY VARIABLE GENERALLY FITS A LOGNORMAL DISTRIBUTION. ITS MEAN HOVERS JUST BELOW THE 1,000 MARK WITH A LONG RIGHT-SIDE TAIL.



ASSAULT DESCRIPTIVE STATISTICS

DESCRIPTIVE STATISTICS	LEGAL? = TRUE	LEGAL? = FALSE
MEAN	580.842	487.900
STANDARD DEVIATION	368.072	366.616
MINIMUM	1.61	43.97
MAXIMUM	2368.22	1557.61
MODE	428.84	874.92
25%	337.440	162.548
MEDIAN	495.170	409.355
75%	729.930	710.608
SAMPLE SIZE (N)	2331	422
KURTOSIS	2.734	-0.083

HOMICIDE DESCRIPTIVE STATISTICS

DESCRIPTIVE STATISTICS	LEGAL? = TRUE	LEGAL? = FALSE
MEAN	14.861	18.955
STANDARD DEVIATION	11.332	16.708
MINIMUM	0.210	0.570
MAXIMUM	94.740	80.600
MODE	5.050	2.870
25%	7.155	5.763
MEDIAN	12.040	13.300
75%	19.500	27.320
SAMPLE SIZE (N)	2331	422
KURTOSIS	4.608	1.149

RAPES DESCRIPTIVE STATISTICS

DESCRIPTIVE STATISTICS	LEGAL? = TRUE	LEGAL? = FALSE
MEAN	60.522	52.514
STANDARD DEVIATION	31.811	31.974
MINIMUM	2.090	1.640
MAXIMUM	199.300	179.720
MODE	22.710	52.480
25%	36.910	29.835
MEDIAN	57.100	47.020
75%	78.435	72.278
SAMPLE SIZE (N)	2331	422
KURTOSIS	0.741	0.551

ROBBERIES DESCRIPTIVE STATISTICS

DESCRIPTIVE STATISTICS	LEGAL? = TRUE	LEGAL? = FALSE
MEAN	451.123	508.172
STANDARD DEVIATION	327.243	404.692
MINIMUM	11.460	2337.520
MAXIMUM	2303.88	42.270
MODE	88.330	42.270
25%	217.720	182.695
MEDIAN	368.81	416.67
75%	596.640	698.133
SAMPLE SIZE (N)	2331	422
KURTOSIS	3.796	1.091

CRIME (GENERAL) DESCRIPTIVE STATISTICS

DESCRIPTIVE STATISTICS	LEGAL? = TRUE	LEGAL? = FALSE
MEAN	1107.378	1067.542
STANDARD DEVIATION	664.598	748.376
MINIMUM	16.49	117.48
MAXIMUM	4352.83	3702.52
MODE	522.97	288.44
25%	658.978	432.625
MEDIAN	966.680	921.145
75%	1398.030	1616.778
SAMPLE SIZE (N)	2331	432
KURTOSIS	2.794	-0.426

DESCRIPTIVE STATISTICS (PART TWO)

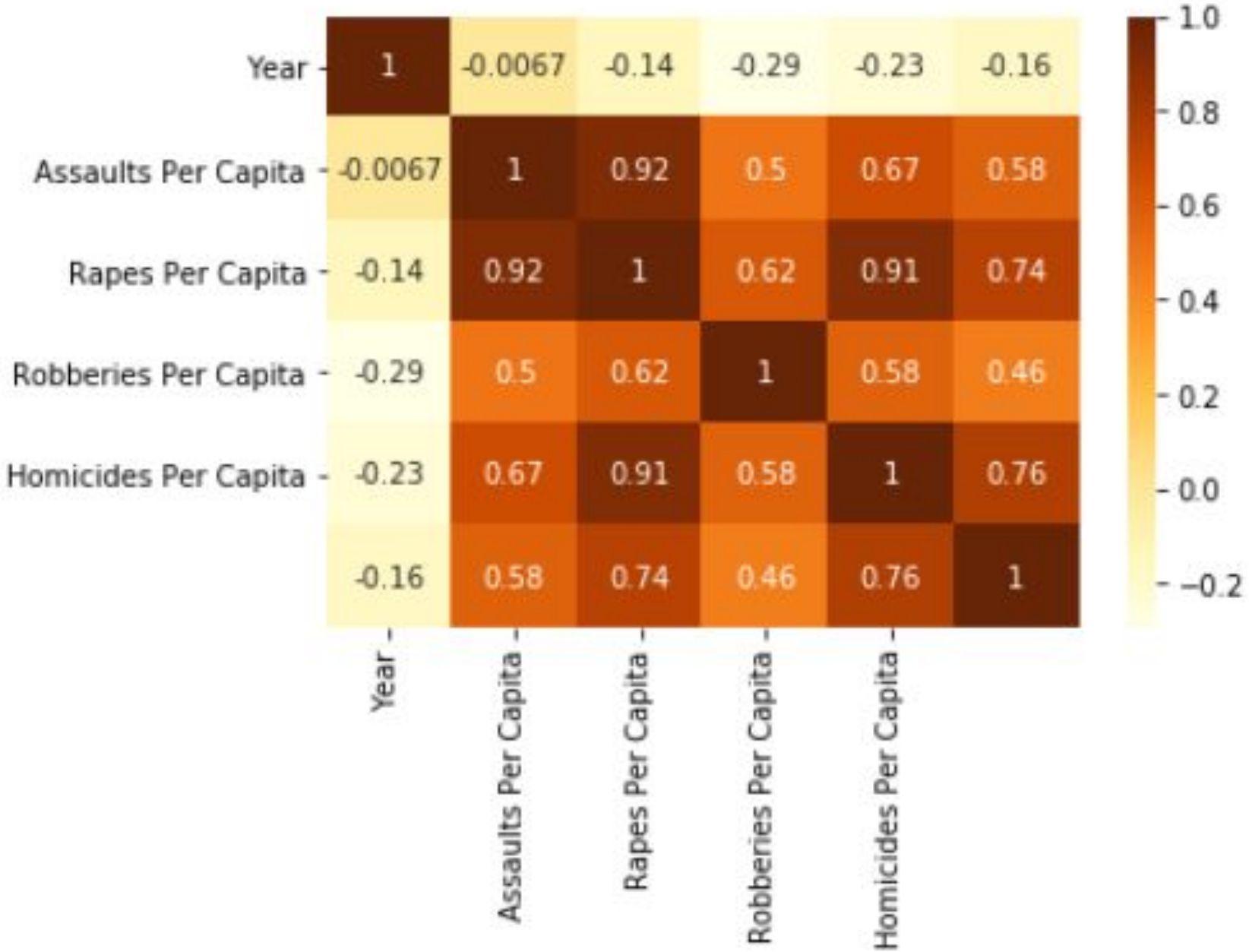
BASED ON THE DESCRIPTIVE STATISTICS, WE HAVE CONCLUDED THAT THERE ARE HIGHER CRIME LEVELS WHEN LEGAL = F FOR HOMICIDE, RAPE AND ROBBERIES, ALTHOUGH WHETHER IT IS HIGH ENOUGH TO BE SIGNIFICANT STATISTICALLY IS CURRENTLY NOT KNOWN AT THIS POINT.

THERE ARE LARGE STANDARD DEVIATIONS, WITH ALL SDS BEING AROUND HALF OF THEIR RESPECTIVE MEANS. ACCEPTABLE KURTOSIS LEVELS RANGE BETWEEN -3 AND 3. THIS WAS MET BY ALL EXCEPT FOR HPC WHEN LEGAL = T AND FOR ROPC WHEN LEGAL = T.

FURTHERMORE, SAMPLE SIZES ARE CONSISTENT UPON ALL CONDITIONS WITH LEGAL = T AT 2154, AND LEGAL = F AT 313.

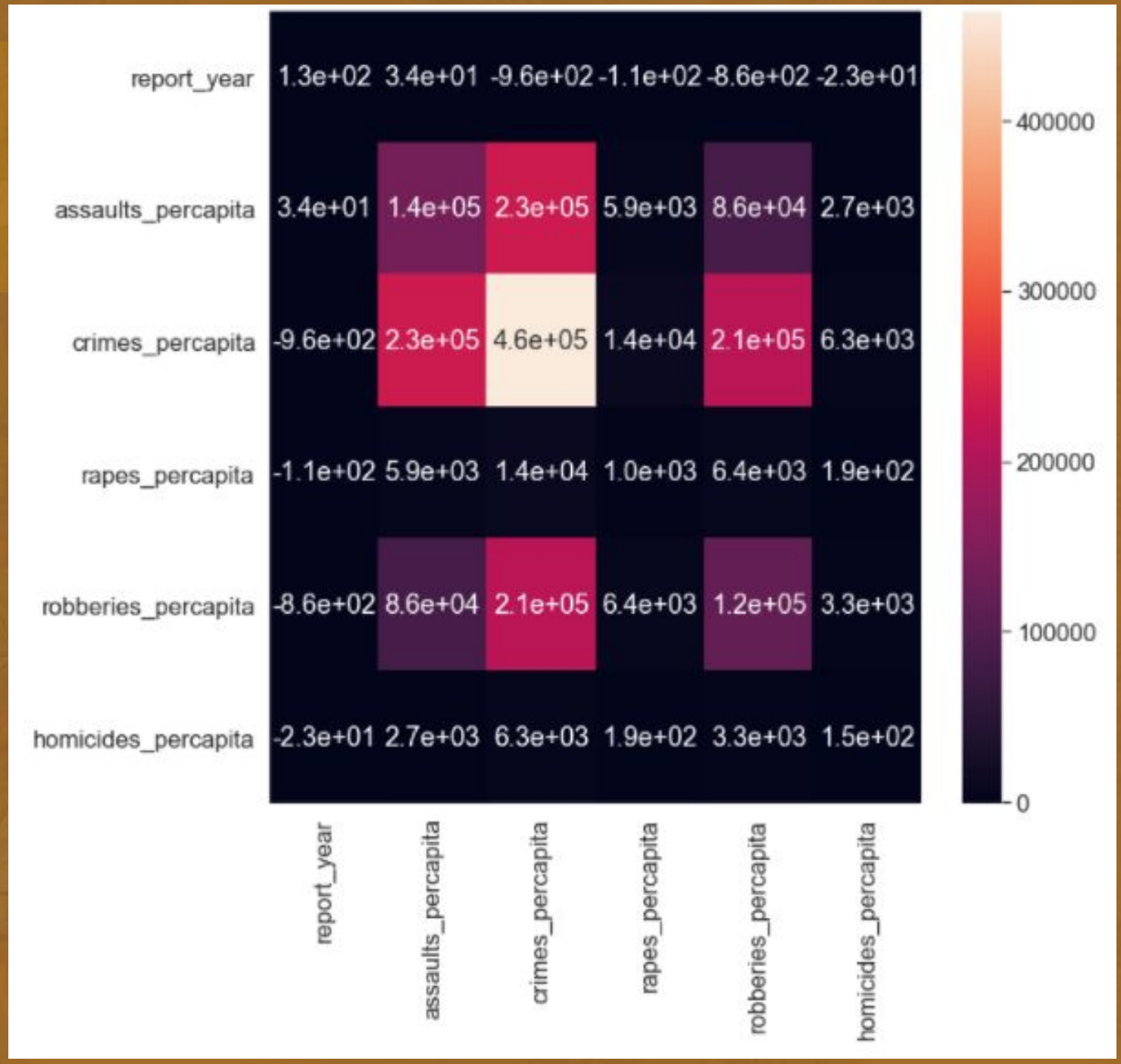
CORRELATION

IT IS IMPORTANT TO NOTE THAT CORRELATION DOES NOT EQUAL CAUSATION. ALL CORRELATION MEASURES IS THE STRENGTH OF A RELATIONSHIP.



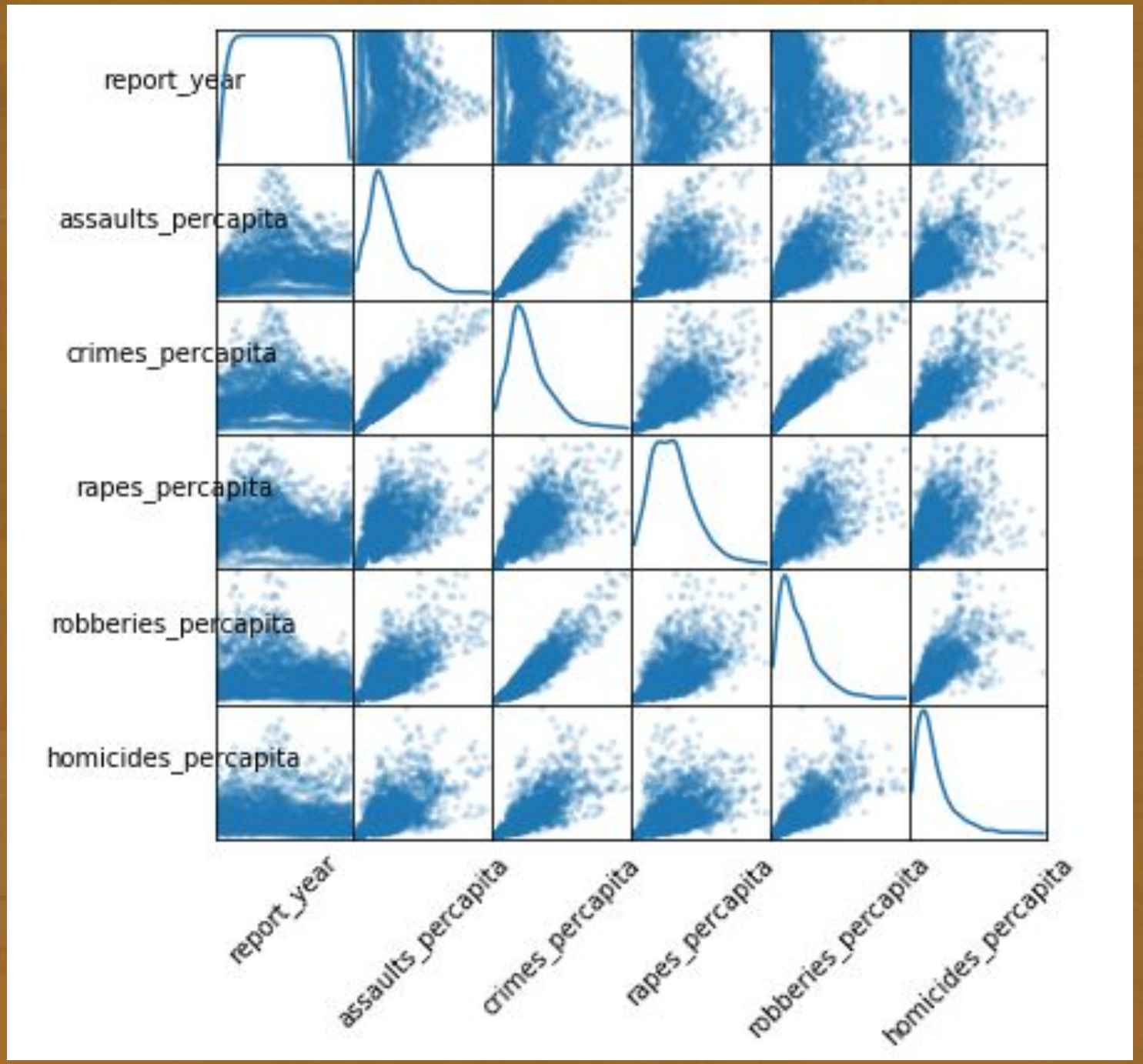
COVARIATION

THE COVARIATION MATRIX SHOWS THAT VERY FEW OF THESE VARIABLES VARY ALONGSIDE ONE ANOTHER. THERE ARE, HOWEVER, NOTABLE EXCEPTION - THE GREATEST OF WHICH ARE BETWEEN CRIMES_PERCAPITA WITH ITSELF.



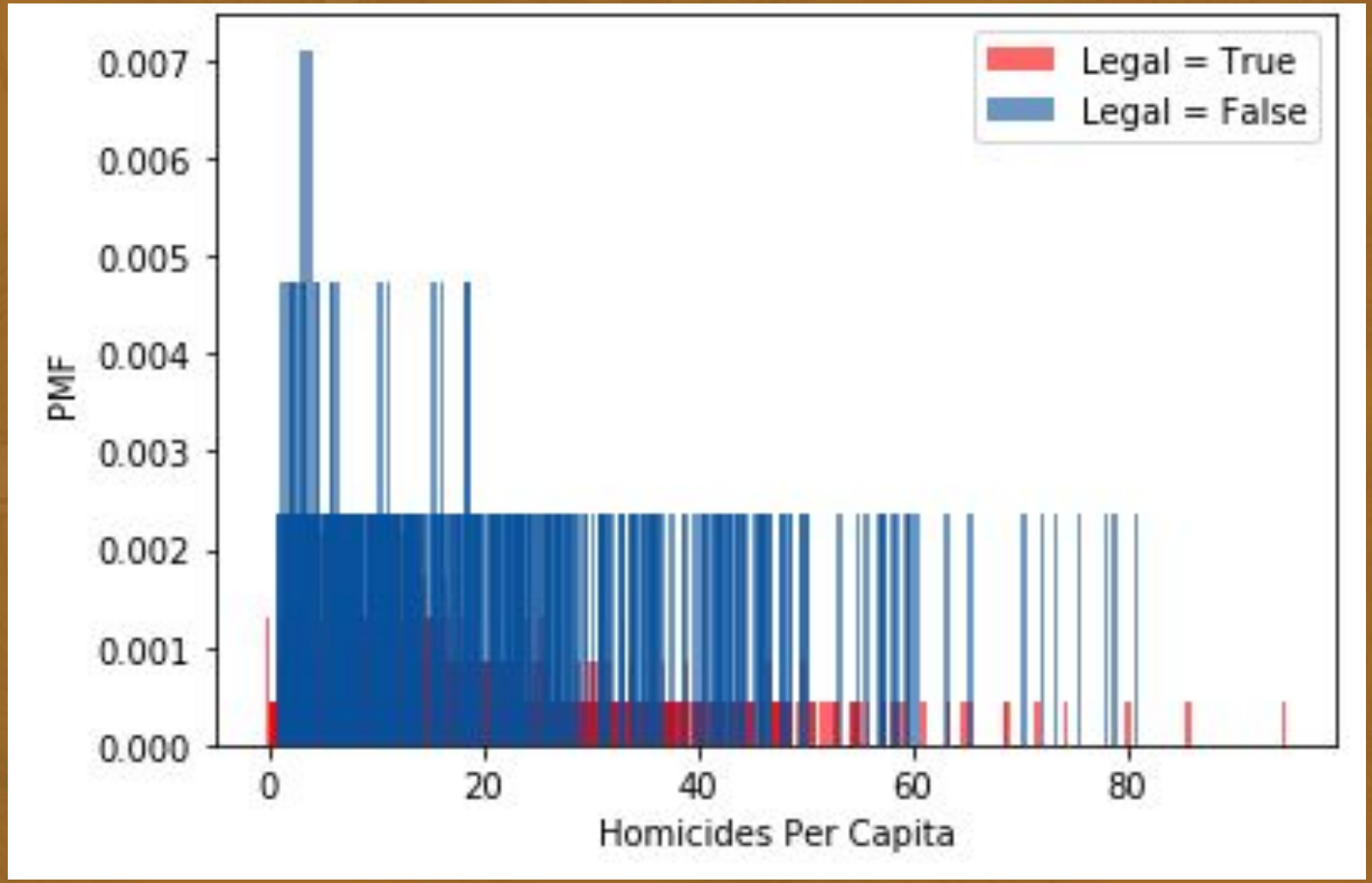
VARIABLE RELATIONSHIPS

- THERE ARE NO NON-LINEAR RELATIONSHIPS AS THEY RELATE TO YEAR.
- THERE ARE OUTLIERS. CRIME OF ALL TYPES HAVE DECREASED AS TIME PROGRESSES, A LOT OF OUTLIERS COME FROM EARLIER IN THE YEAR SECTION.
- HOMICIDES AND RAPES HAVE MORE OUTLIERS THAN WITH OTHER CRIMES BECAUSE THEIR RATES ARE SO MUCH LOWER THAN OTHERS. RAPES AND HOMICIDES AREN'T AS COMMON AS ROBBERY AND ASSAULT.



PROBABILITY MASS FUNCTION

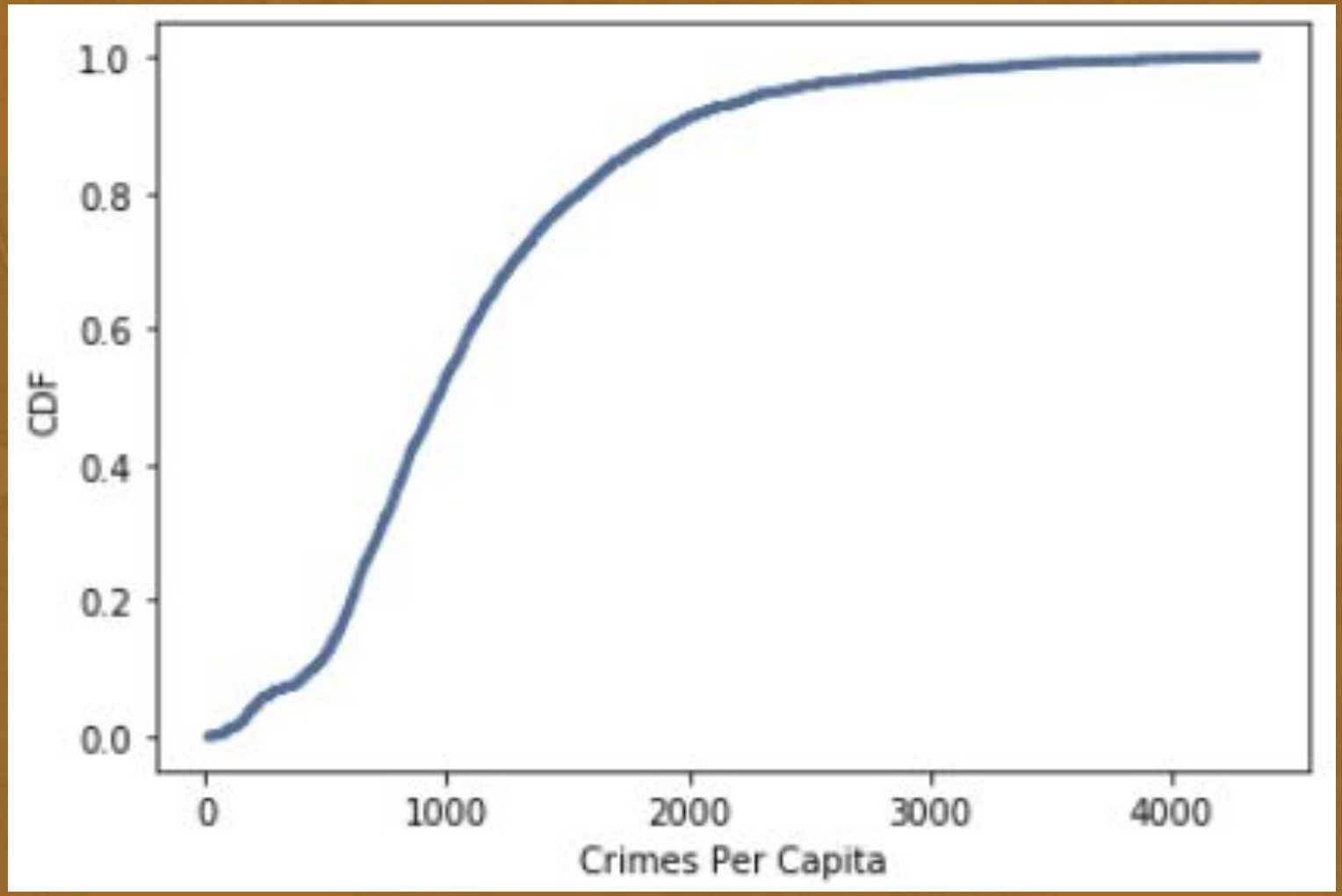
USING THE CPC VARIABLE TO GAUGE CRIME IN GENERAL, THE PROBABILITY MASS FUNCTION FOR BOTH VARIABLES SHOWN BOTH CENTRAL TENDENCIES TO LIE AT THE LOWER END OF THE SPECTRUM. THE MAIN DIFFERENCE IS WHEN LEGAL = TRUE, THE PMF IS MORE EVENLY DISPERSED. THIS MEANS THAT THERE IS A HIGHER LIKELIHOOD OF CRIME FOR WHEN LEGAL = TRUE.



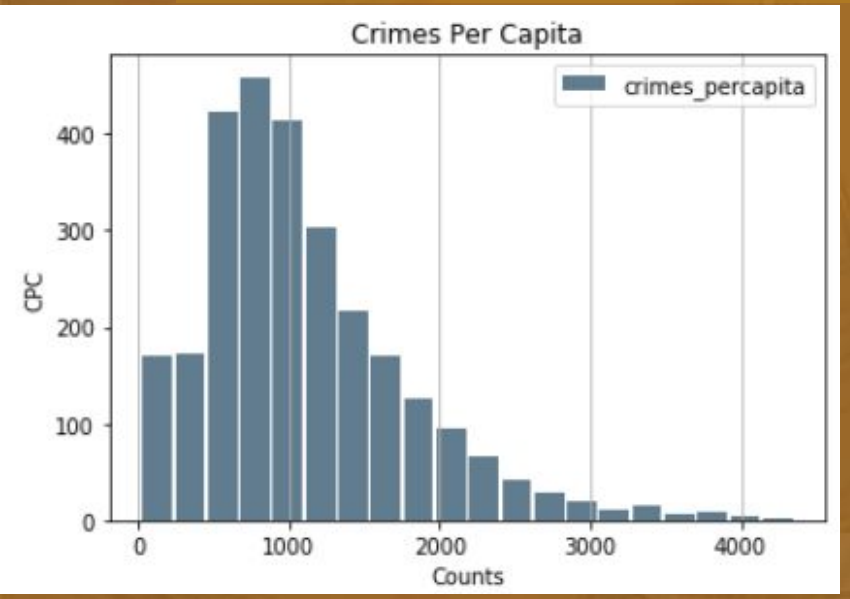
CUMULATIVE DISTRIBUTION FUNCTION

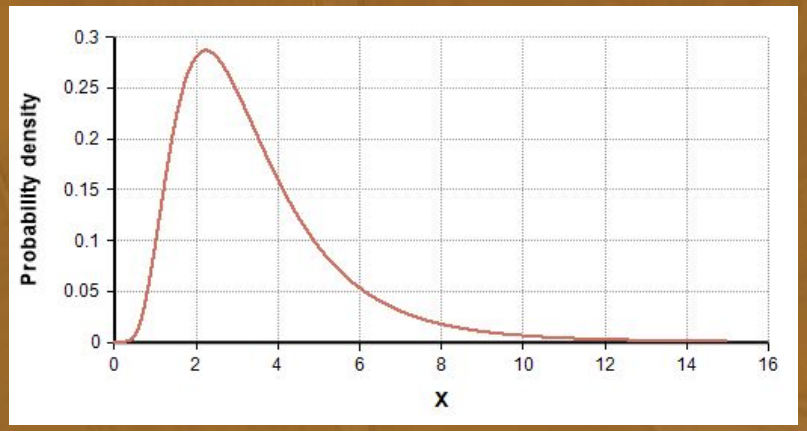
IN ORDER TO UNDERSTAND THE STATUS QUO, THE CUMULATIVE DISTRIBUTION FUNCTION IS SHOWN.

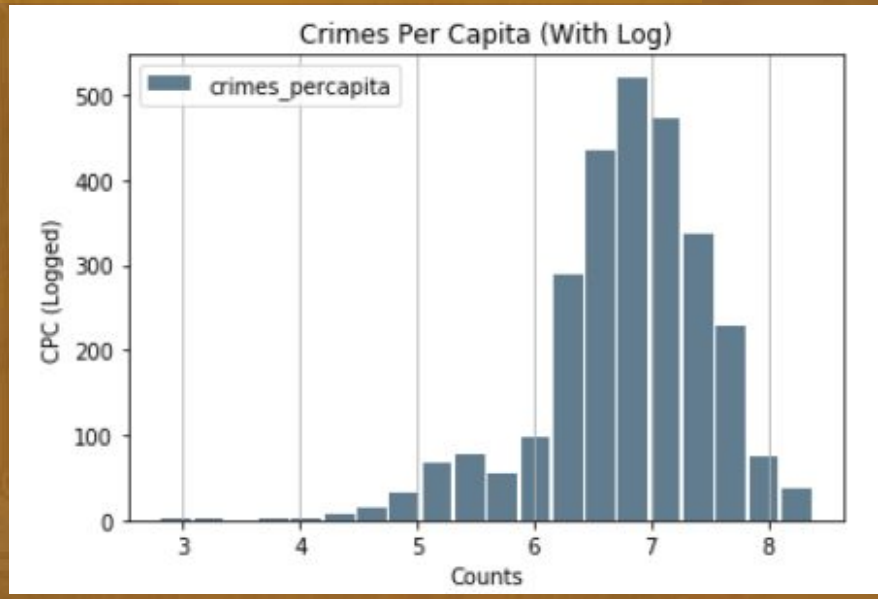
THE CDF SHOWS THE STEEPEST SLOPE OF 1,000 TO 2,000 CRIMES PER CAPITA, SHOWING THIS IS WHERE THE HIGHEST RATE OF INCREASE IS WITHIN FREQUENCY.



ANALYTIC DISTRIBUTION ANALYSIS







AN ANALYTIC ANALYSIS FOUND THE ORIGINAL HISTOGRAM OF THE CRIMES PER CAPITA (LEFT) STRONGLY RESEMBLED THE LOGNORMAL DISTRIBUTION (MIDDLE). THIS DATA CAN EASILY RESEMBLE MORE OF THE BELL-SHAPED NORMAL CURVE, THIS DATASET HAS BEEN PROCESSED THROUGH A LOGARITHMIC CONVERSION (RIGHT).

INDEPENDENT T-TESTS

TEST PARAMETERS FOR ALL VARIABLES:

ALPHA LEVEL: .05

DEGREES OF FREEDOM: 2767

T-CRITICAL VALUE: -1.645

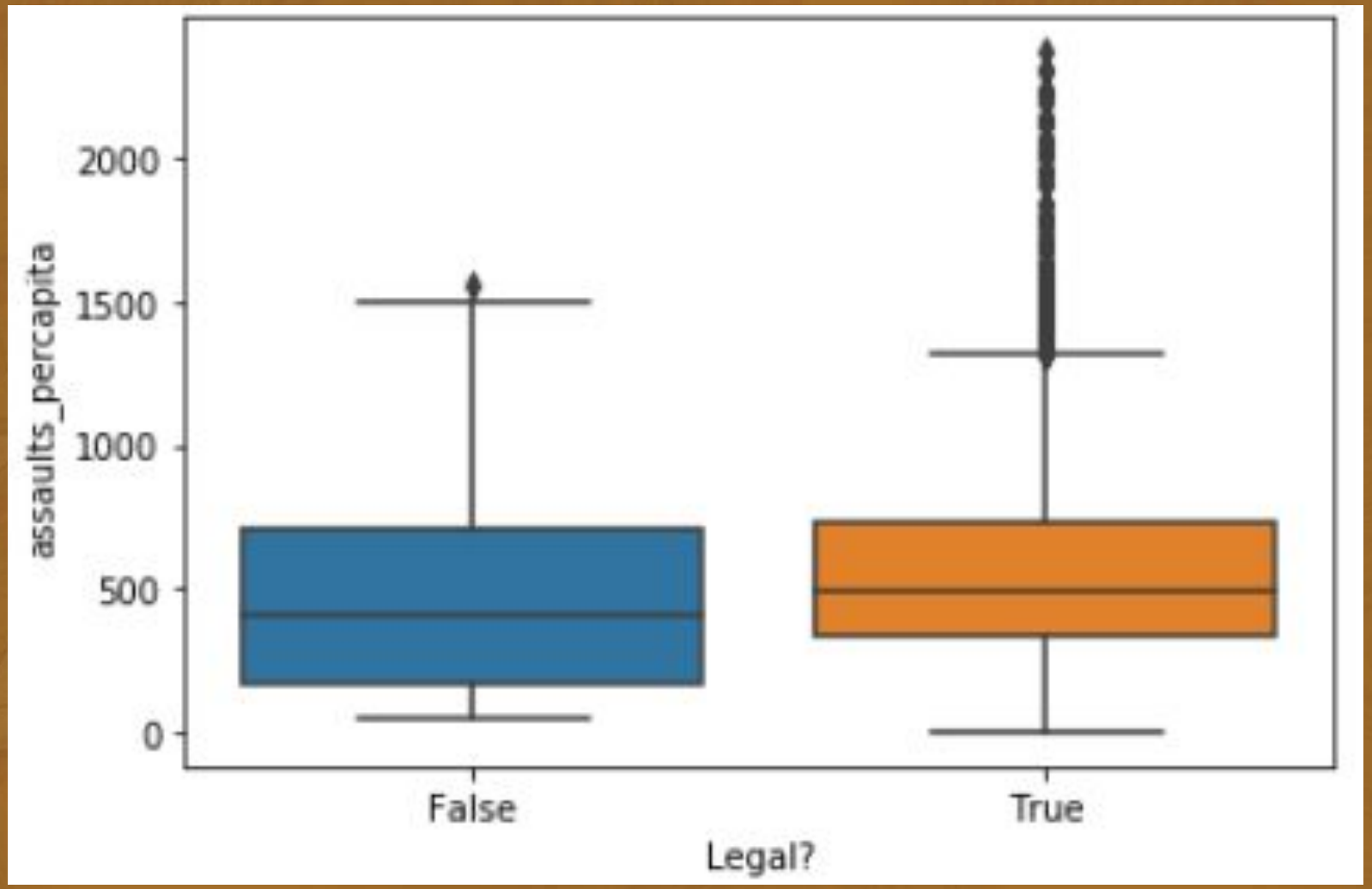
H0: LEGAL(Y) = LEGAL(N) HA: LEGAL(Y) ≠ LEGAL(N)

VARIABLES	ASSAULTS	HOMICIDE	RAPES	ROBBERIES	CRIME (GENERAL)
STANDARD ERROR	~14.012	~0.535	~1.217	~13.960	~26.949
T-OBTAINED	~4.774	~6.284	~4.753	~3.167	~1.110
P-VALUE	<0.001	<0.001	<0.001	~0.002	~0.267

INDEPENDENT T-TEST - ASSAULT

DO STATES WITH THE DEATH PENALTY SEE LOWER ASSAULT RATES?

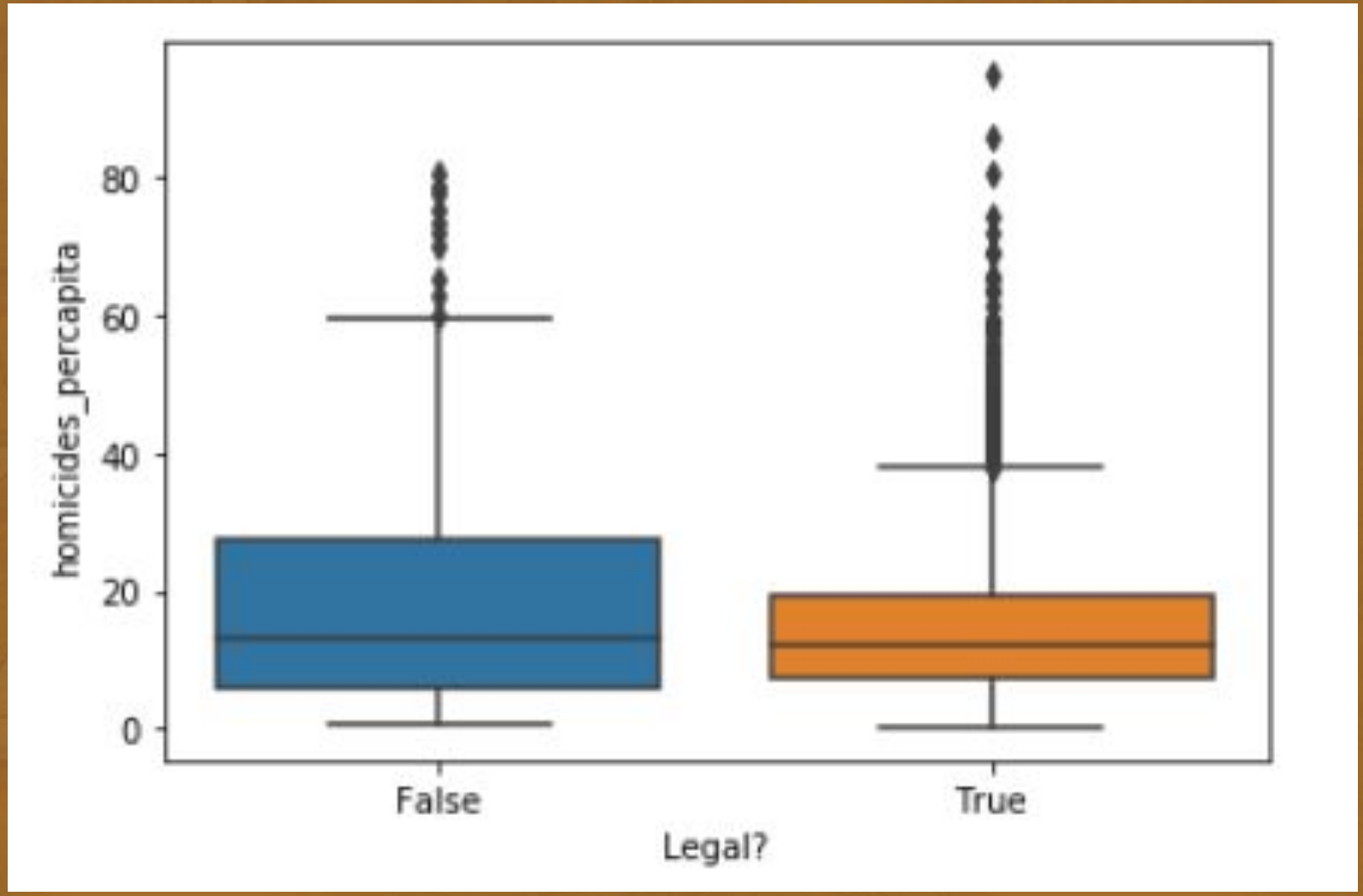
NO. THE P-VALUE IS NOT <.05. IN FACT, THE ASSAULT LEVELS ARE HIGHER FOR WHEN *LEGAL? = TRUE* ACCORDING TO OUR SAMPLE.



INDEPENDENT T-TEST - HOMICIDES

DO STATES WITH THE DEATH PENALTY SEE LOWER HOMICIDE RATES?

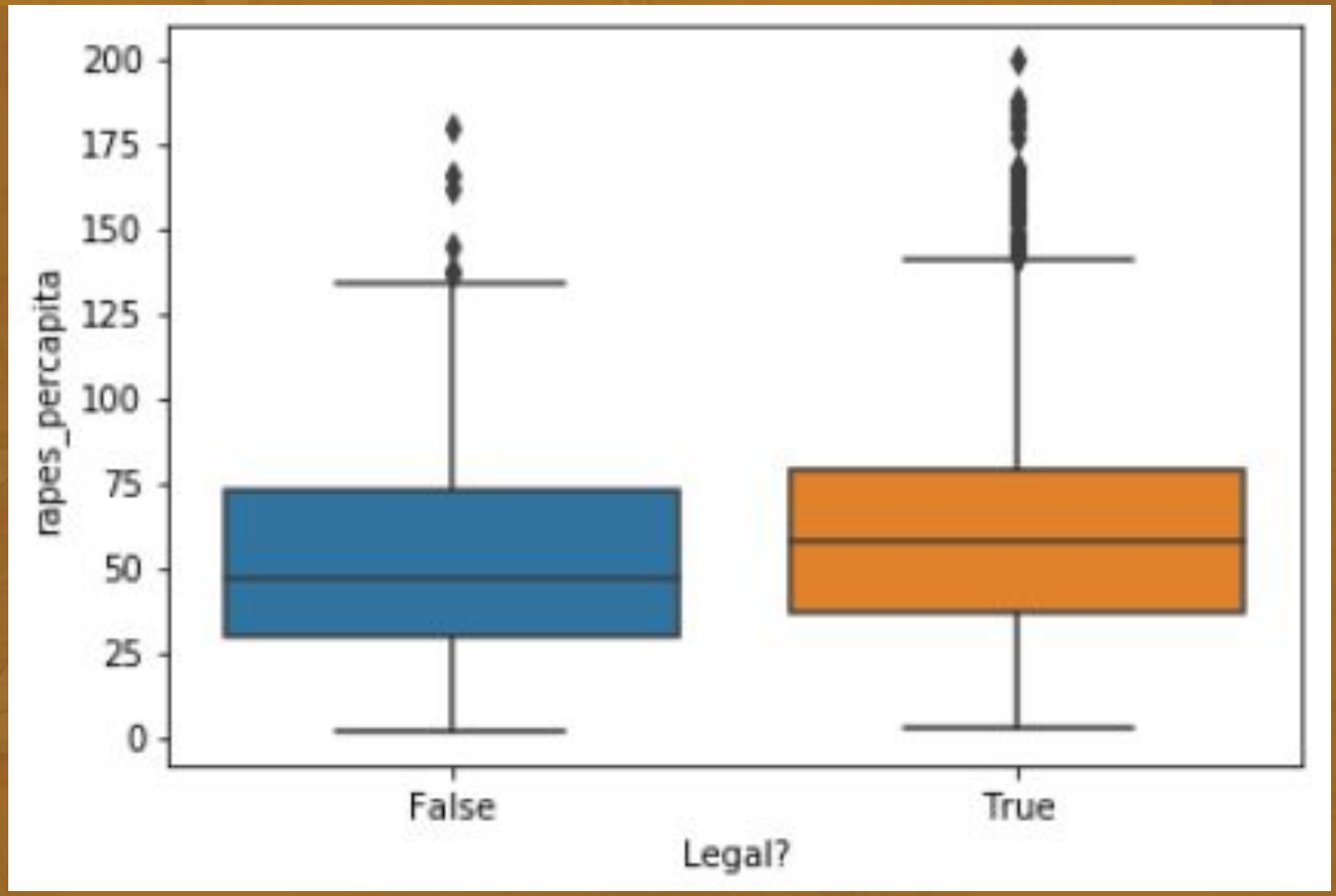
YES. THERE ARE HIGHER HOMICIDE RATES AND THE P-VALUE THAT THIS OCCURS BY RANDOM CHANCE IS LESS THAN .001, INDICATING A SIGNIFICANT DIFFERENCE.



INDEPENDENT T-TEST - RAPES

DO STATES WITH THE DEATH PENALTY SEE LOWER RAPE RATES?

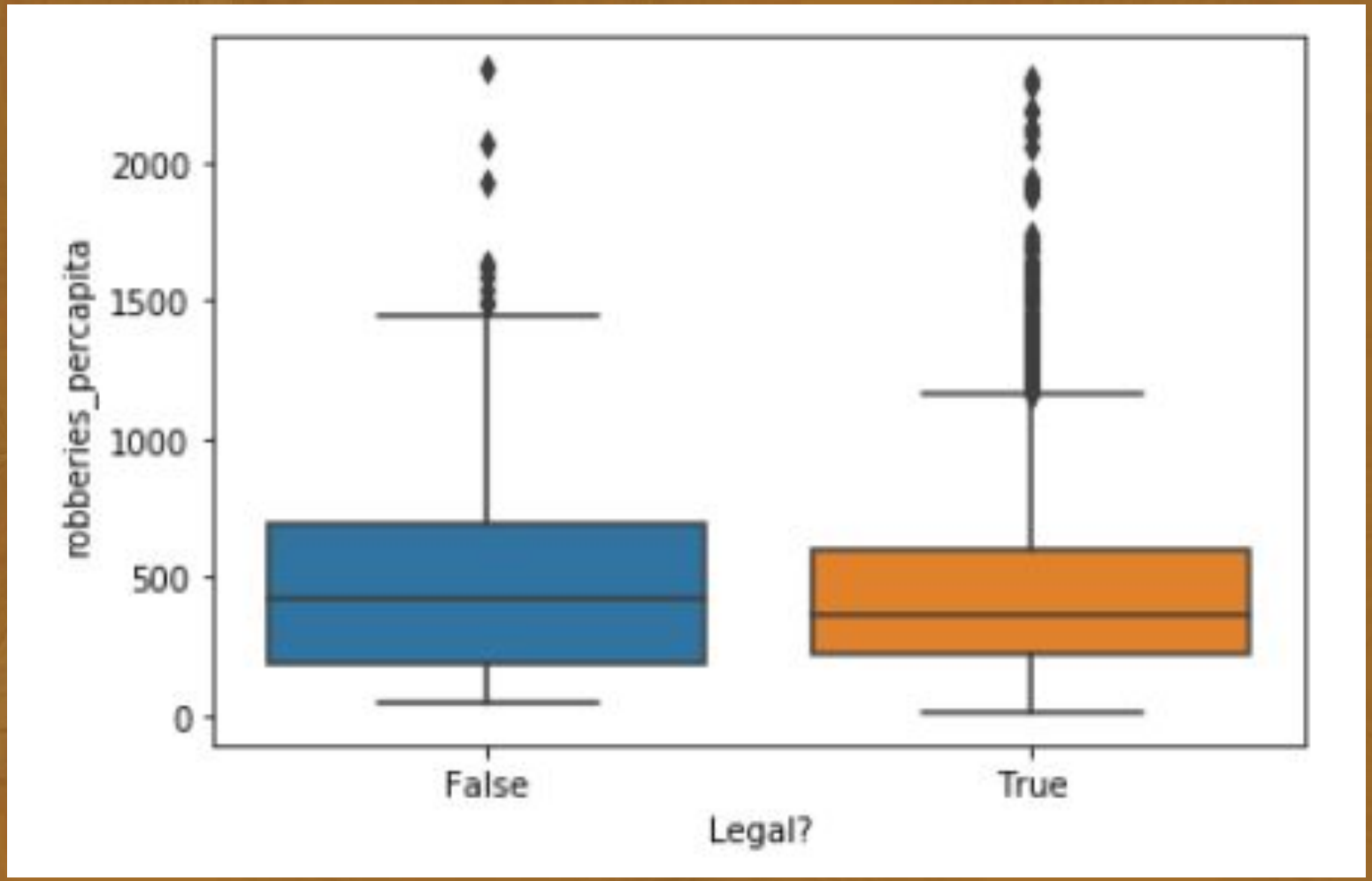
NO. THE P-VALUE IS NOT <.05. THEREFORE, WE MUST CONCLUDE THAT STATES WITH THE DEATH PENALTY DO NOT SEE LOWER RAPE RATES.



INDEPENDENT T-TEST - ROBBERIES

DO STATES WITH THE DEATH PENALTY SEE LOWER ROBBERY RATES?

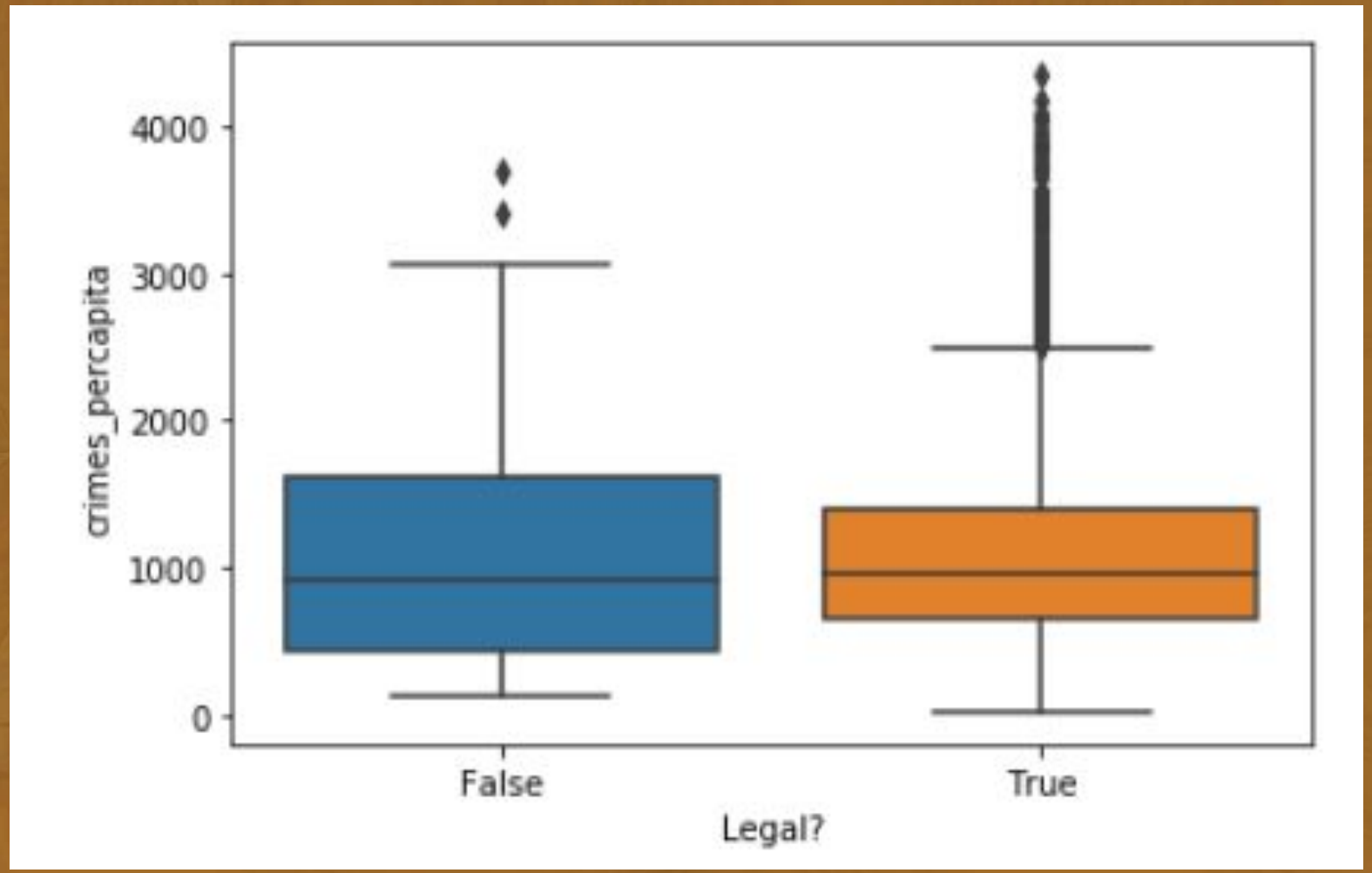
YES. STATES WITH THE DEATH PENALTY SEE LESS ROBBERY RATES AS THE P-VALUE IS <.001.



INDEPENDENT T-TEST – CRIME (GENERAL)

DO STATES WITH THE DEATH PENALTY SEE LOWER CRIME RATES?

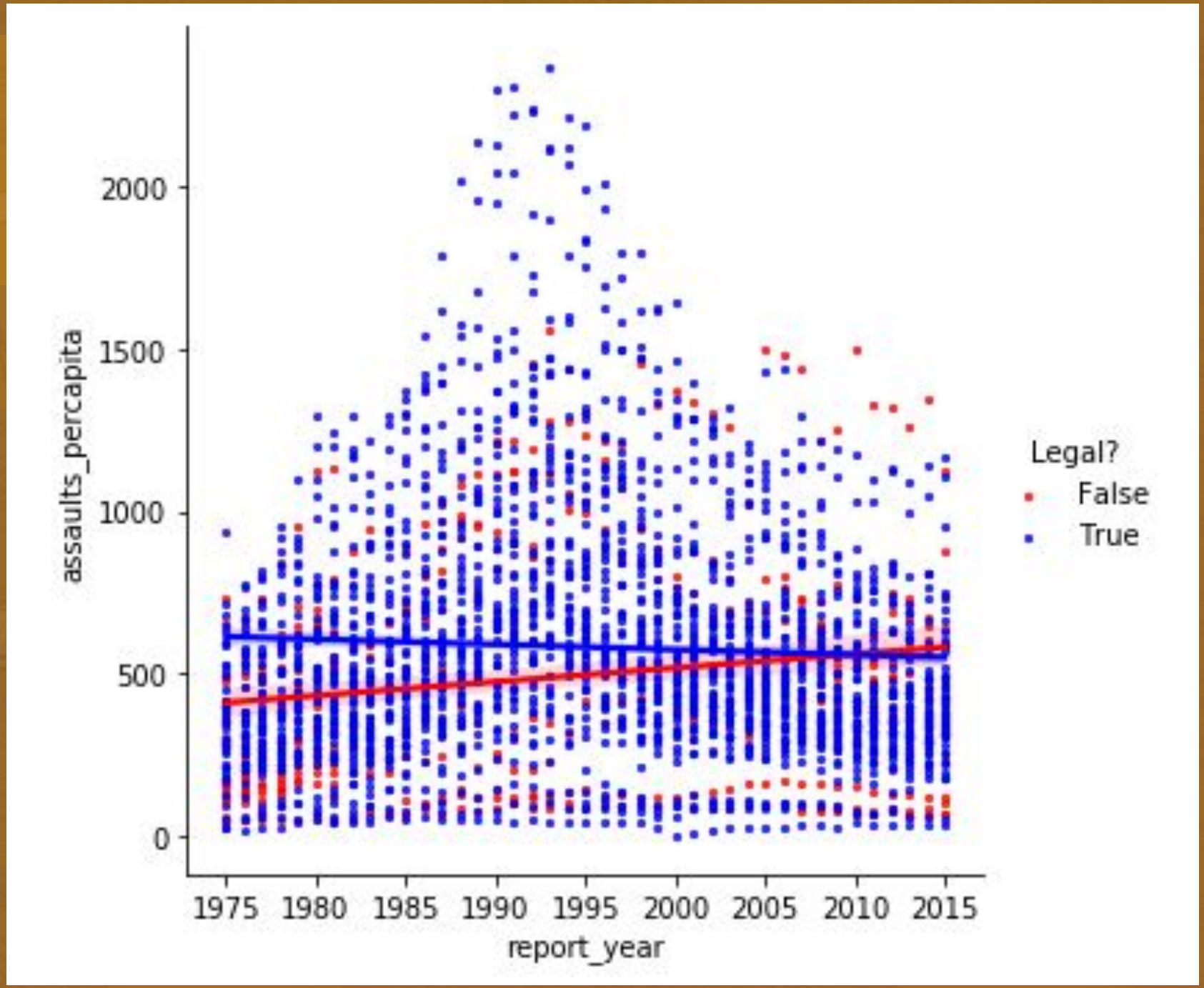
NO. THE CRIME RATES ARE ACTUALLY HIGHER FOR WHEN *LEGAL? = TRUE*, ALMOST TO THE POINT OF STATISTICAL SIGNIFICANCE WITH A P-LEVEL AT ~.059.



REGRESSION ASSAULT

SLOPE = ~-0.400

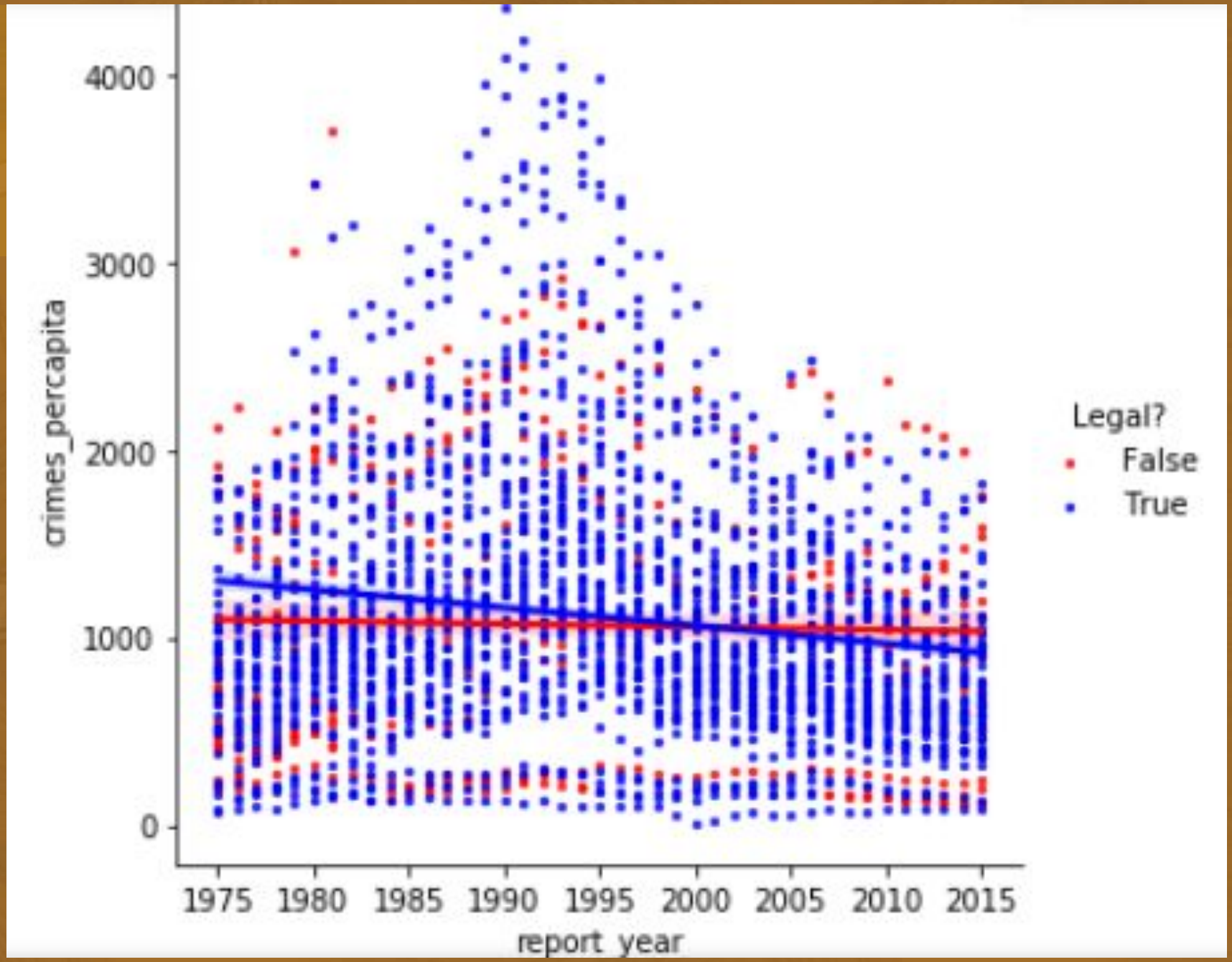
AVERAGE DIFFERENCE = ~-93.824



REGRESSION
CRIME (GENERAL)

SLOPE = ~-7.929

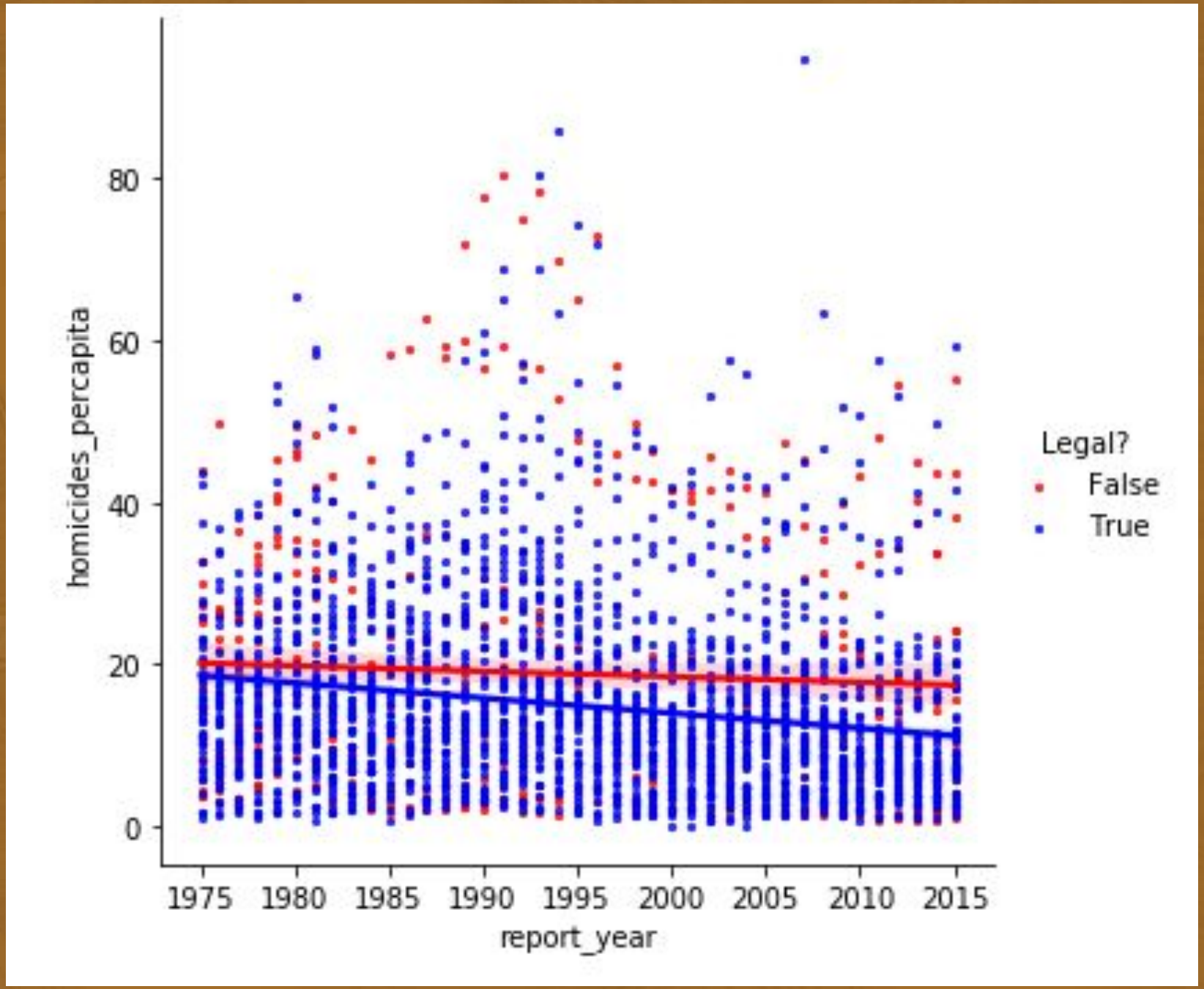
AVERAGE DIFFERENCE = ~-57.329



REGRESSION
HOMICIDE

SLOPE = ~-0.162

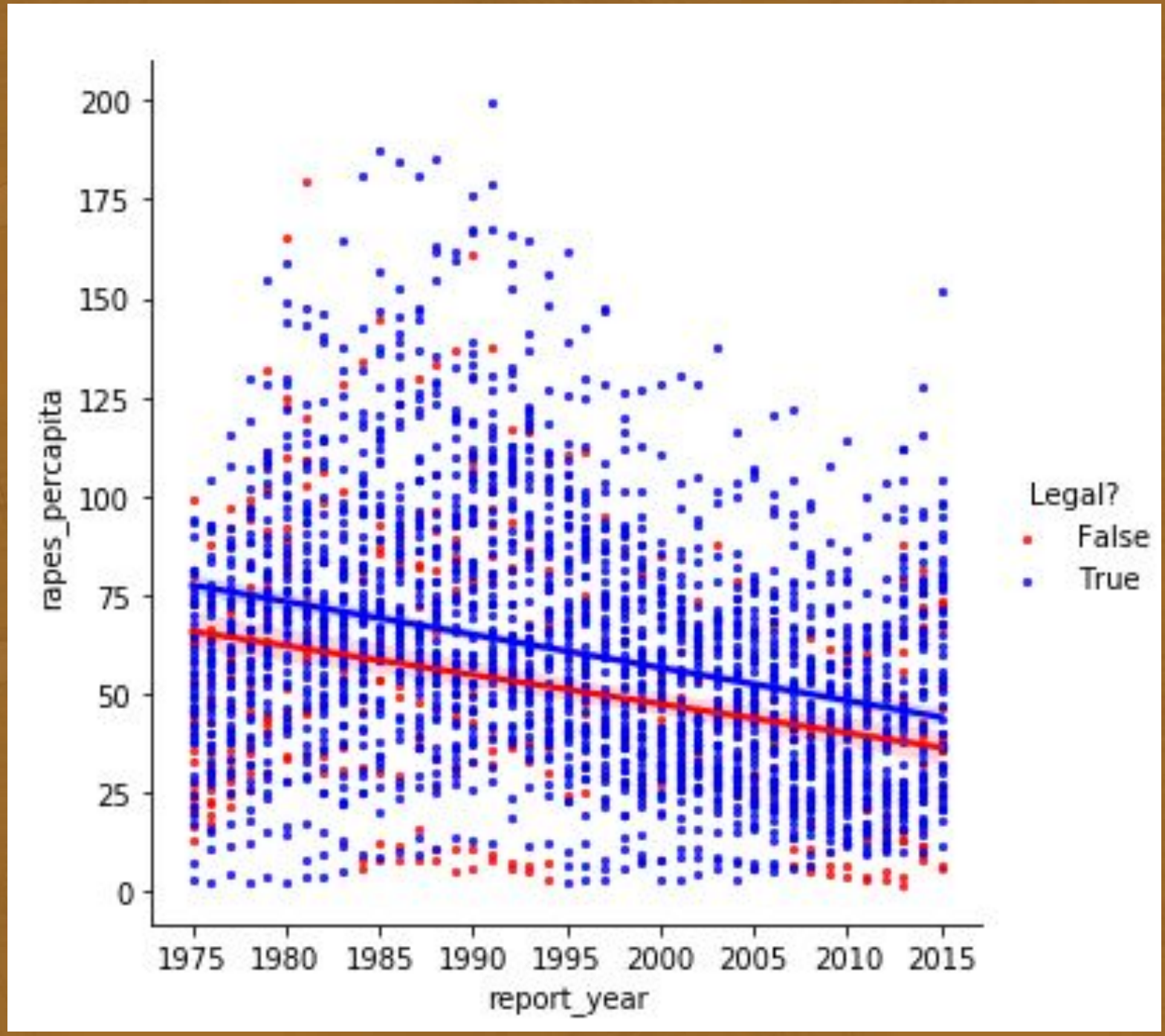
AVERAGE DIFFERENCE = ~-3.736



REGRESSION RAPES

SLOPE = ~-0.814

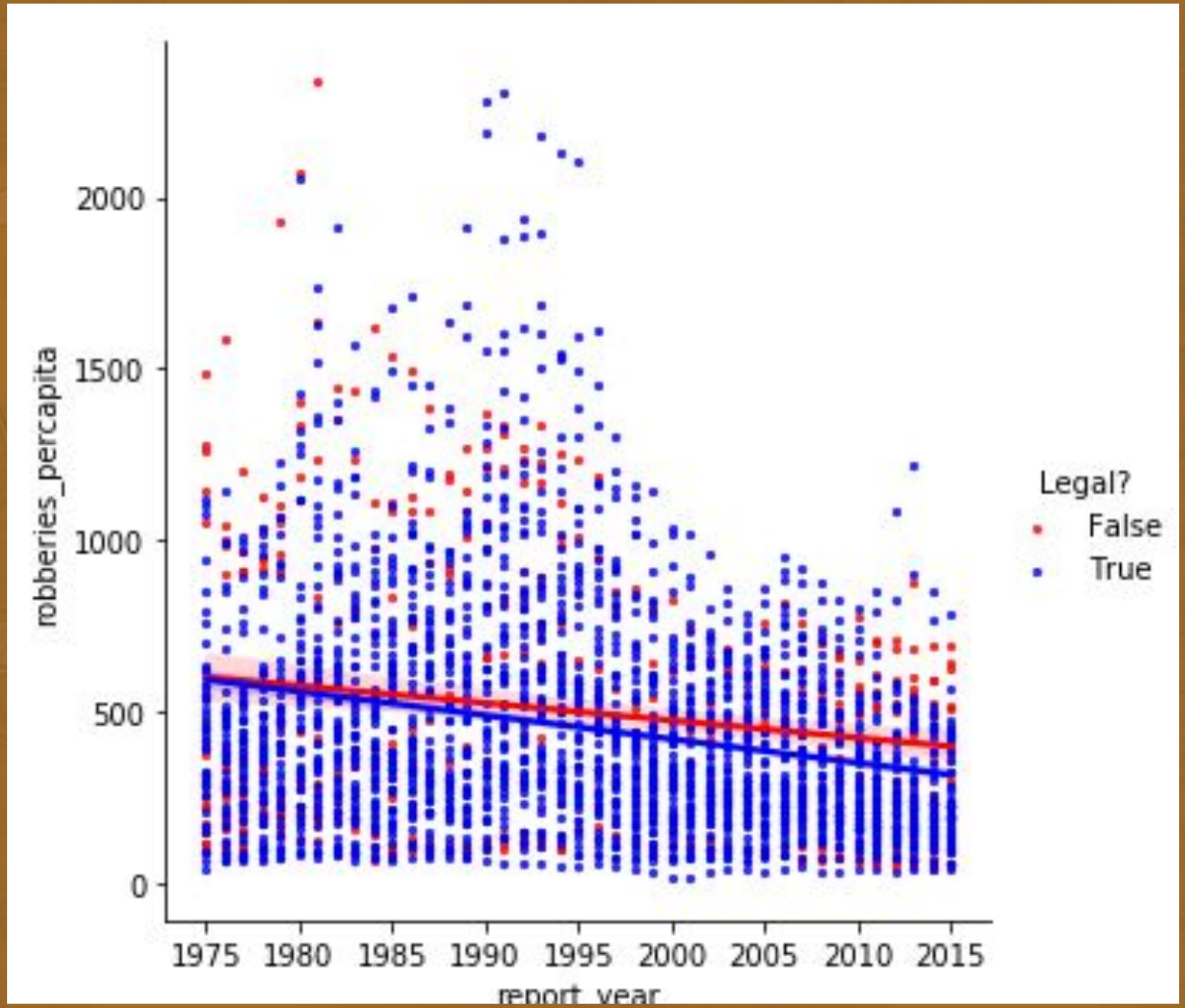
AVERAGE DIFFERENCE = ~--9.804



REGRESSION ROBBERIES

SLOPE = ~-6.552

AVERAGE DIFFERENCE = ~-42.569



CONCLUSION

From correlation analysis, we can verify that all calculable variables have at least a moderate level of correlation with one another.

Regression analysis shows APC values increasing throughout the years for legal = F. For general crime, crime appears to be dropping more quickly for when legal = T. For when legal = T, robbery rates also have a more steep drop.

To answer the overarching question - based on the results of an independent t- test, we can conclude that states see less homicides and robberies. However, when we look at crime in total, we do not see any difference.

With the question, "Do states with the death penalty see less crime?" the answer is no.

REFERENCES:

DEATH PENALTY FOR OFFENSES OTHER THAN MURDER. (N.D.). RETRIEVED OCTOBER 09, 2020, FROM HTTPS://DEATHPENALTYINFO.ORG/FACTS-AND-RESEARCH/CRIMES-PUNISHABLE-BY-DEATH/DEATH-PENALTY-FOR-OFFENSES-OTHER-THAN-MURDER

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