MG-212 Course Project

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To: Dr. Thomas Craig

Date: Today's date

Subj: Analysis of Crime in the United States

Section 1: Introduction/Overview

Crime in the Unites States has always been a problem in society. As young college students who will be getting ready to graduate college in a few years and look for job opportunities in the United States it is important to consider crime. It is important to understand and look for trends over the past decade to better understand how crime in the United States. When finding a new place (state) to live in crime should be an important factor to consider before moving to start a job and or raise a family. The last thing you want to do is purchase an expensive house and move your new family to a place that doesn't make them feel safe. As, a result, it is essential that we continue to look at the data and possibly find out new ways whether it be through new laws or new technology to prevent crime rates from rising in different state across America.

Section 2: Statement of Hypotheses

While studying the data that I have obtained from the Disaster Center it will be interesting to look at the violent crime rates and property crime rates as it relates to a decade for each

state for the years of 1960-2019. There rates we calculated using 100,000 per population in each state including the District of Columbia. The following hypotheses will be tested to determines the trends and relationships among the data.

Hypotheses

HO: All regions have statistically similar means for avg violent crime rates in the most recent decade 2010-2019

Null (h0): All means are equal

Alternative (h1) Not all means are equal

HO: All regions have statically similar means for CAGR violent crime rate in the most recent decade 2010-2019

Null (h0): All means are equal

Alternative (h1) Not all means are equal .

Section 3: Results

One-Way ANOVA: 2010 Decade Avg Violent Crime vs. Region

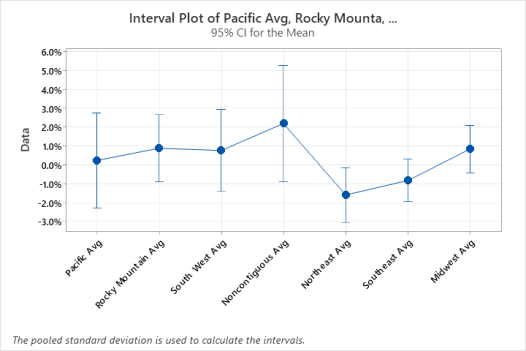
As shown above, the first hypothesis tested is that there is a difference in average violent crime for the most recent decade 2010-2019 by regions. From this test of the Tukey

comparison one-way ANOVA, we are 95% confident that there is some difference between the average violent for the most recent decade across geographic regions. There is statistically significant data to suggest that the counts across the regions are different as the regions fall into different grouping. Therefore, we accept the null hypothesis that there is a difference.

Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping	
Sout West Avg	4	495.7	A	B
Noncontiguous Avg	2	495	A	B
Southeast Avg	14	487.9	A	
Midwest Avg	12	338.6	A	B
Pacific Avg	3	328.9	A	B
Rocky Mountian Avg	6	321.1	A	B
Northeast Avg	9	255.1		B

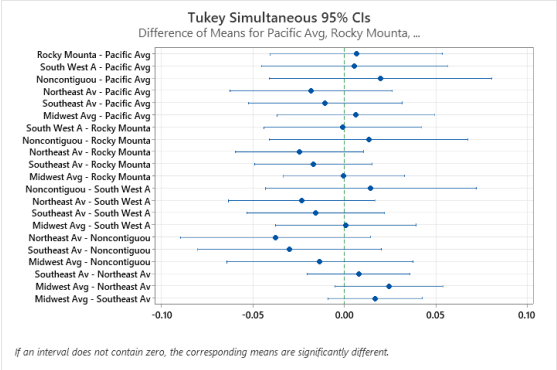
Means that do not share a letter are significantly different.



This is supported by the p-value of .021, which is less than the 5% acceptance rate telling us that there is a 2.1% chance that the null hypothesis is true. This is below the .05 acceptance rate that we are comfortable accepting. Furthermore, by looking at the interval plot for the Tukey comparison, the interval for each geographic region shows us the graphical representation of the grouping shown above.

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	6	432493	72082	2.81	0.021
Error	43	1103539	25664		
Total	49	1536032			



One-Way ANOVA: 2010 Decade CAGR Violent Crime vs. Region

As shown above, the second hypothesis tested is that all regions have statically similar means for CAGR violent crime rate in the most recent decade 2010-2019. From this test of the Tukey comparison one-way ANOVA, we are 76% confident that there is some difference between the average decade CAGR of violent crimes across geographic regions. There is statistically significant data to suggest that the counts across the regions are different as the regions fall into different grouping. Therefore, we accept the null hypothesis that there is a difference

Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
Noncontiguous Avg	2	0.0219	A
Rocky Mountain Avg	6	0.0088	A
Midwest Avg	12	0.00836	A
South West Avg	4	0.0076	A
Pacific Avg	3	0.00235	A
Southeast Avg	15	-0.00821	A
Northeast Avg	9	-0.01589	A

Means that do not share a letter are significantly different.

This is supported by the p-value of .076, which is greater than the 5% acceptance rate telling us that there is a 7.6% chance that the null hypothesis is true. This is above the .05 acceptance rate that we are comfortable accepting. This would then require to look further into the data because it is just outside the 5% acceptance rate to see if there is any specific correlation or quiescence that would prove that the means of the different regions are growing at a constant grow rate.

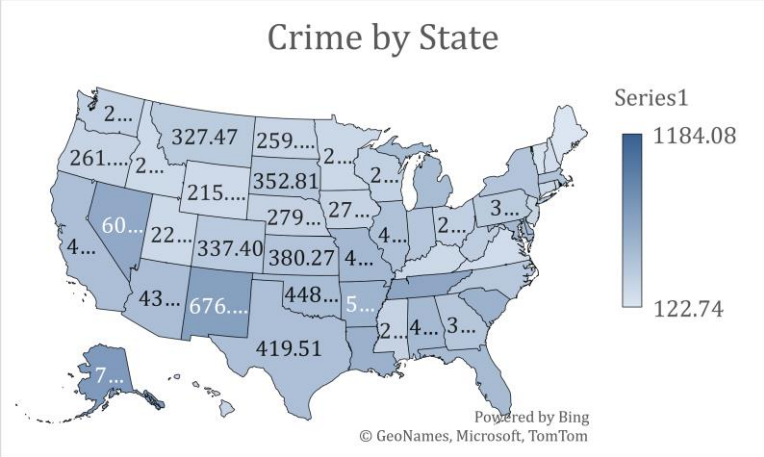
Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	6	0.005775	0.000963	2.07	0.076
Error	44	0.020434	0.000464		
Total	50	0.026209			

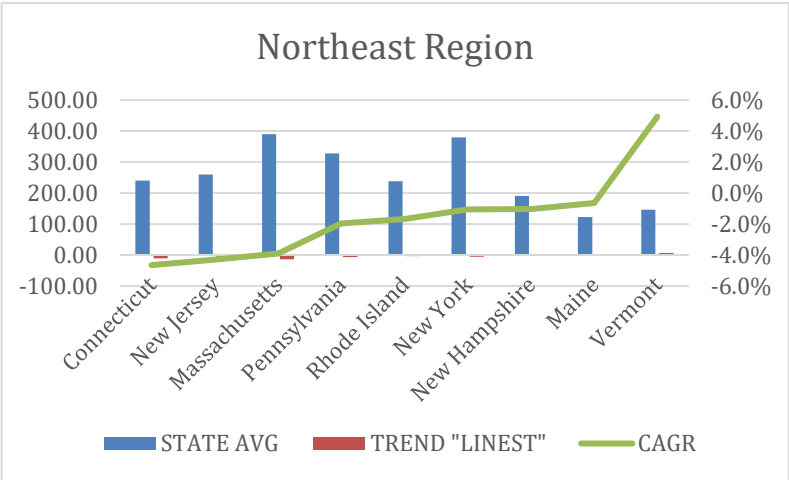
Section 4: Discussion and Conclusion

This analysis further helped my understand of the current crime rate situation and allowed me to further dig deeper into different place within the United States to see where is it most dangerous to live. After running my Anova test above I was able to getting better understanding of the growth rate by each region as well as which region had the most violent crime. From my analysis above we saw that the south region had the highest average of violent crime. As well as the southwest with the highest continuous growth rate of crimes. This information is important to me as someone who is going to be graduating in

the near future and will need to look at different places to live. One of the main concerns of mine is which state would be the safest.



As you can see from the graph above the darker blue indicates the most amount of crime and is where I would want to avoid living. From the looks of this map and where I would like to live the north seems like one the safest places to live. It also helps that this is where I am born and raised and went to school in the north my whole. To further narrow down which region to live and eventually find what state would fit my needs I ran another visualization to help demonstrate.



From the graph above it shows each of the state in which I have identified the northeast region. The green line indicates the CAGR. Maine and Vermont have the state average crime rate but a much higher CAGR which means that the state is trending more crime each year. Pennsylvania where I am from has a average crime rate and a relatively low CAGR. However, it looks like the best state to live in the northeast is actually Connecticut. Connecticut has one of the lowest crime rates besides Maine and Vermont but also have a CAGR close to zero. As a conclusion I will take this information that I have learned and remember this when I am in my job search as potential places to live, work, and raise a family so that I know I will be safe as well as the people around me .