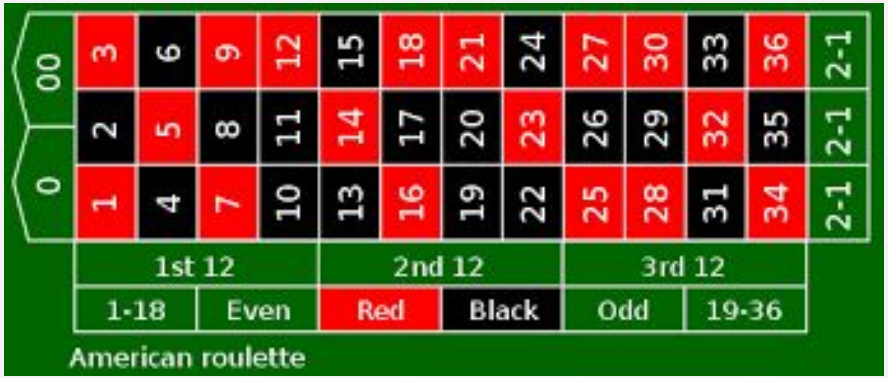
Casino Impact on Crime

By Ethan Severance and Trevor Mcdonough



Overview

- How did we get the data
- Family battle with Casinos
- Null vs Alternative
- Crime effects, any truth behind the claims?
- Second Null and Alternative “does crime increase after building a Casino”
- Conclusion, Final thoughts

Data Retrieval

- Find Cities with Casinos
- Only include cities that did not previously have a Casino
- Built in the past 10 years, but before 2020
- Find Police department with largest radius in that area
- Collect data from FBI.gov on reported cases of Crime
- Combine data into one csv file for ease of use.

Family Vs Casino

Why the controversy

Gambling in the United States has been gaining popularity the past 50 years. By 1990 there were a significant amount of people already addicted to gambling to the point of no return.

Mafia Movies

As Mafia movie began to grow in popularity, so did peoples thoughts about gambling. More and more people started to associate crime, gangs, and the mafia with casinos. If it wasn't for the massive amount of money casinos bring in, it's hard to tell if most states would ever have legalized it.

Family Wellness

In order to approximate Family Wellness we need a decent proxy variable.

Leisure Parks

A place where families can spend quality time together while living in the city, making it a perfect proxy for estimating overall **Family Wellness.**

Proxy: **A substitute variable due to Family Wellness being difficult to measure on its own**

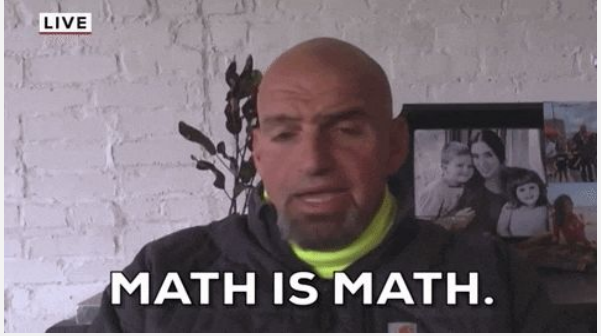
Casino CIties:

- **Baltimore**
- **Cincinnati**
- **Plain Ridge**
- **Columbus**
- **Des Plaines**
- **Everett**
- **Oxford**
- **Schenectady**
- **SpringField**

Similar Cities:

- **Towson**
- **Covington**
- **Wrentham**
- **Dublin**
- **Arlington**
- **Chelsea**
- **Lewiston**
- **Albany**
- **Chicopee**

Casino City	Parks in Casino City	Similar City	Parks in Similar City
Baltimore	16	Towson	8
Cincinatti	5	Covington	15
Plain_Ridge	18	Wrentham	11
Columbus	1	Dublin	11
Des_Plaines	17	Arlington	17
Everett	19	Chelsea	20
Oxford	20	Lewiston	20
Schenectady	19	Albany	18
Springfield	17	Chicopee	18



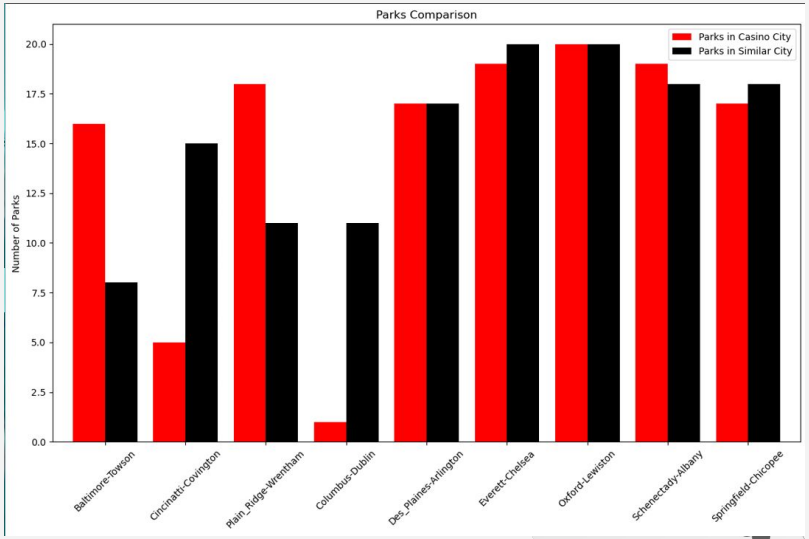
Comparing Means

Null Hypothesis

H_0: The means are not statistically different; $\mu_{Casino} = \mu_{Similar}$

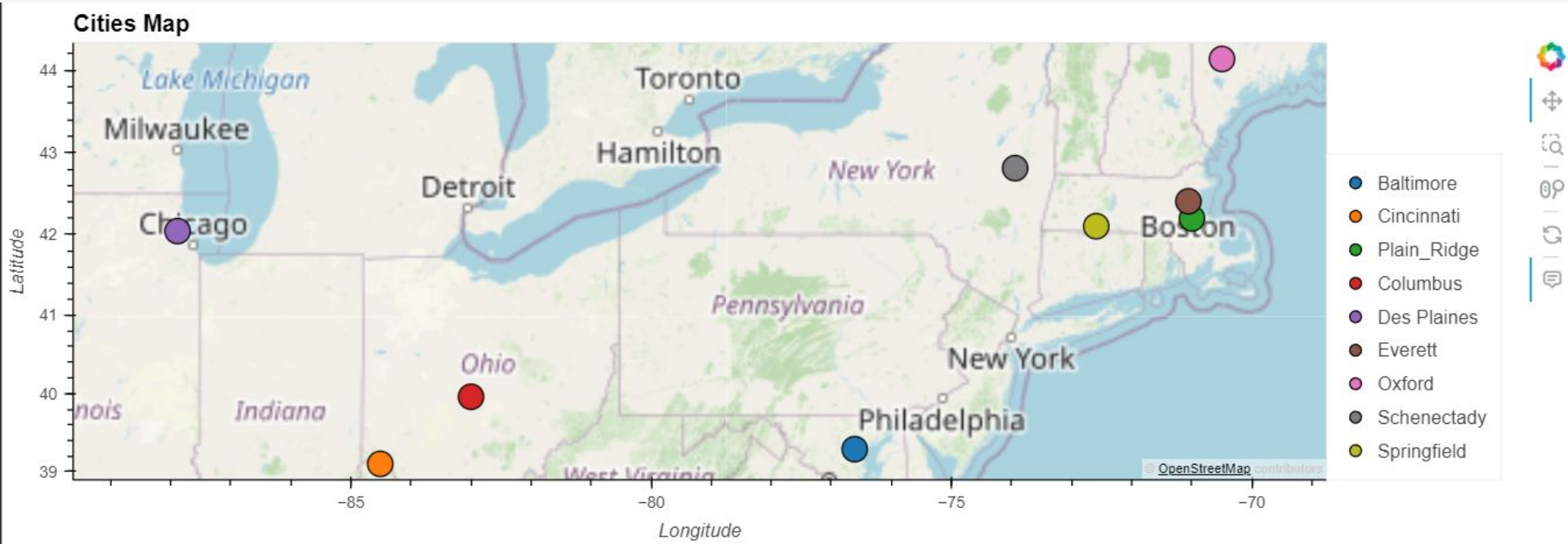
Alternative Hypothesis

H_1: The means are statistically different; $\mu_{Casino} \neq \mu_{Similar}$



T-stat = -.2476
P-Value = .8076
We fail to reject the Null at a 95% confidence level.

Casino Cities

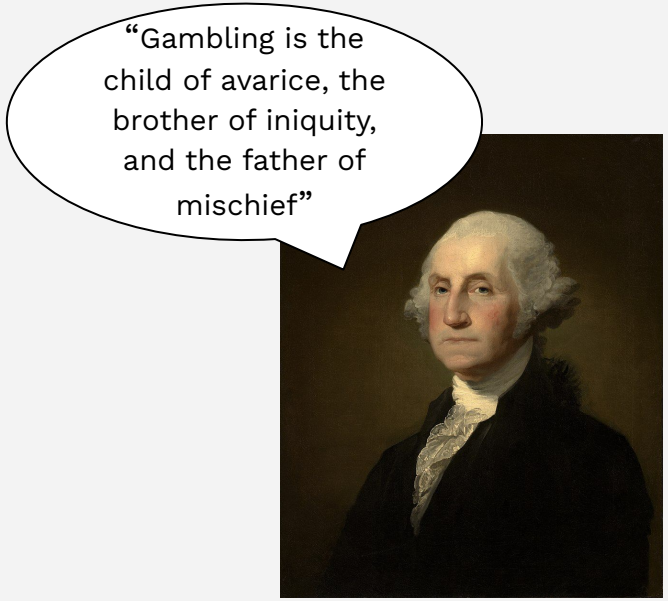


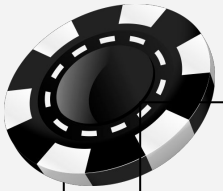
Effects on Crime

- Criminal activities have been associated with casinos and gambling since its inception

- How has the rise of these gambling hubs affected the crime rates in the selected cities?

- Data Collection:
  - Federal Bureau of Investigation: Crime Data Explorer
  - Gathered police department data from each of the sample cities for analysis

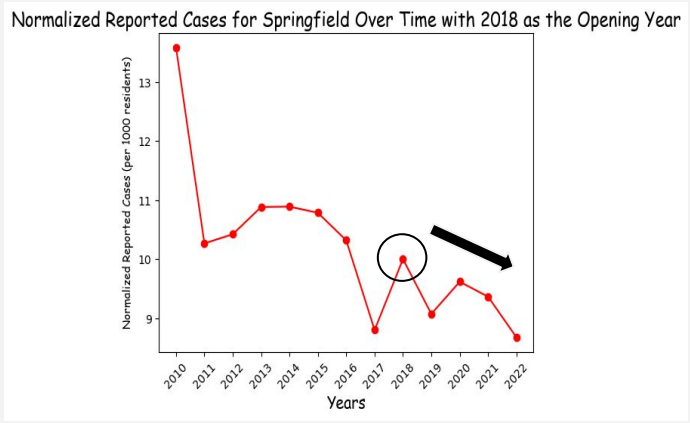


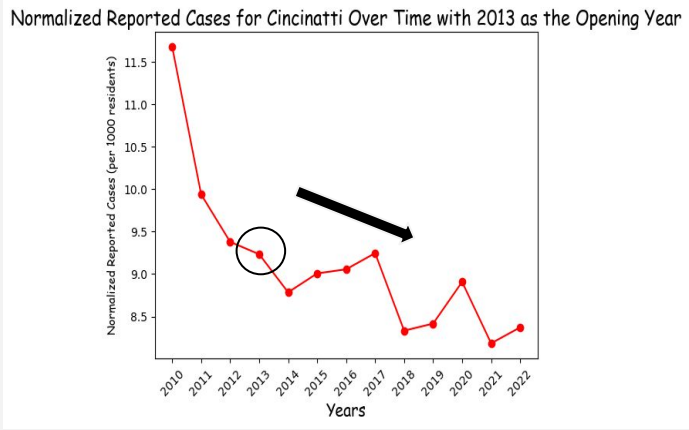


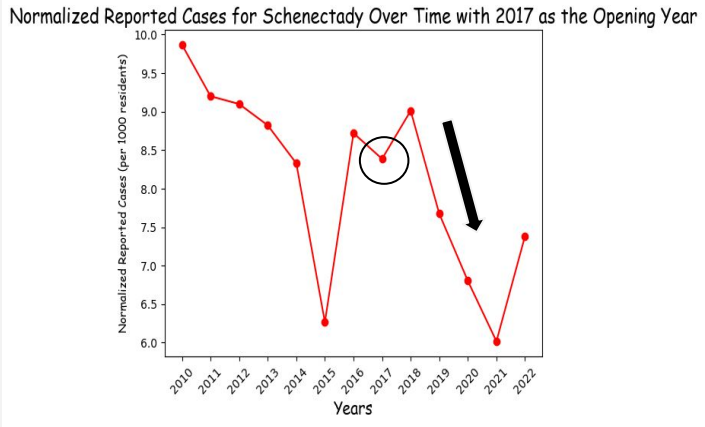
DataFrame

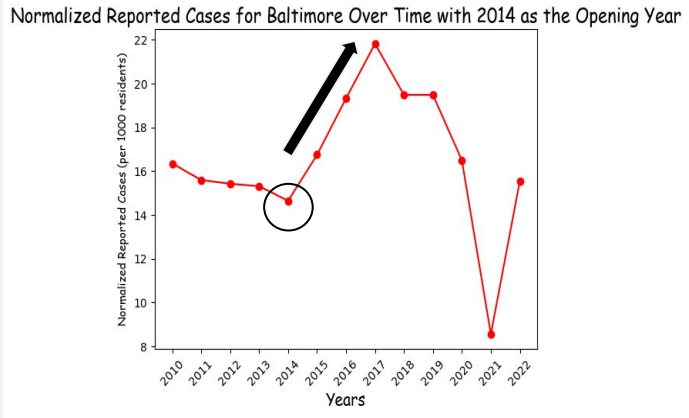
City	series	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Opening Year
Baltimore	Reported	9316	8886	8789	8725	8346	9542	11010.0	12430.0	11100.0	11101.0	9398.0	4880.0	8861.0	2014
Cincinatti	Reported	3615	3076	2903	2858	2719	2788	2803.0	2862.0	2579.0	2605.0	2757.0	2533.0	2591.0	2013
Clark_County	Reported	239	248	283	245	298	338	323.0	331.0	261.0	282.0	357.0	352.0	348.0	2015
Columbus	Reported	5472	5228	4808	4446	4640	4758	4694.0	4594.0	4586.0	4637.0	5233.0	5547.0	4082.0	2012
Des_Plaines	Reported	57	61	65	56	53	50	51.0	61.0	39.0	56.0	43.0	77.0	69.0	2011
Everett	Reported	228	195	171	202	175	151	156.0	152.0	176.0	251.0	181.0	142.0	169.0	2019
Oxford	Reported	21	23	19	16	11	20	18.0	28.0	16.0	25.0	26.0	35.0	12.0	2012
Schenectady	Reported	679	633	626	607	573	431	600.0	577.0	620.0	528.0	468.0	414.0	508.0	2017
Springfield	Reported	2093	1582	1606	1677	1678	1662	1590.0	1356.0	1541.0	1398.0	1482.0	1443.0	1337.0	2018

City Data


Normalized Reported Cases for Springfield Over Time with 2018 as the Opening Year
Normalized Reported Cases (per 1000 residents)
Years


Normalized Reported Cases for Cincinatti Over Time with 2013 as the Opening Year
Normalized Reported Cases (per 1000 residents)
Years


Normalized Reported Cases for Schenectady Over Time with 2017 as the Opening Year
Normalized Reported Cases (per 1000 residents)
Years


Normalized Reported Cases for Baltimore Over Time with 2014 as the Opening Year
Normalized Reported Cases (per 1000 residents)
Years

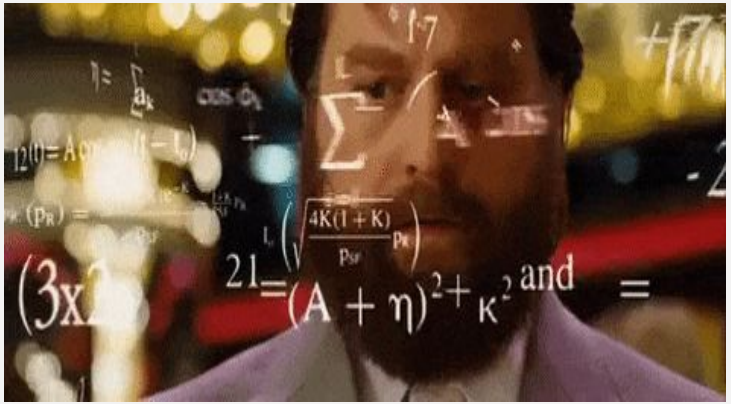
Two-Tailed T-Test

Null Hypothesis

H_0: There is no significant difference between the mean crime rate in the city before and after the construction of the casino. ; $\mu_{Before} = \mu_{After}$

Alternative Hypothesis

H_1: The means are statistically different; $\mu_{Before} \neq \mu_{After}$

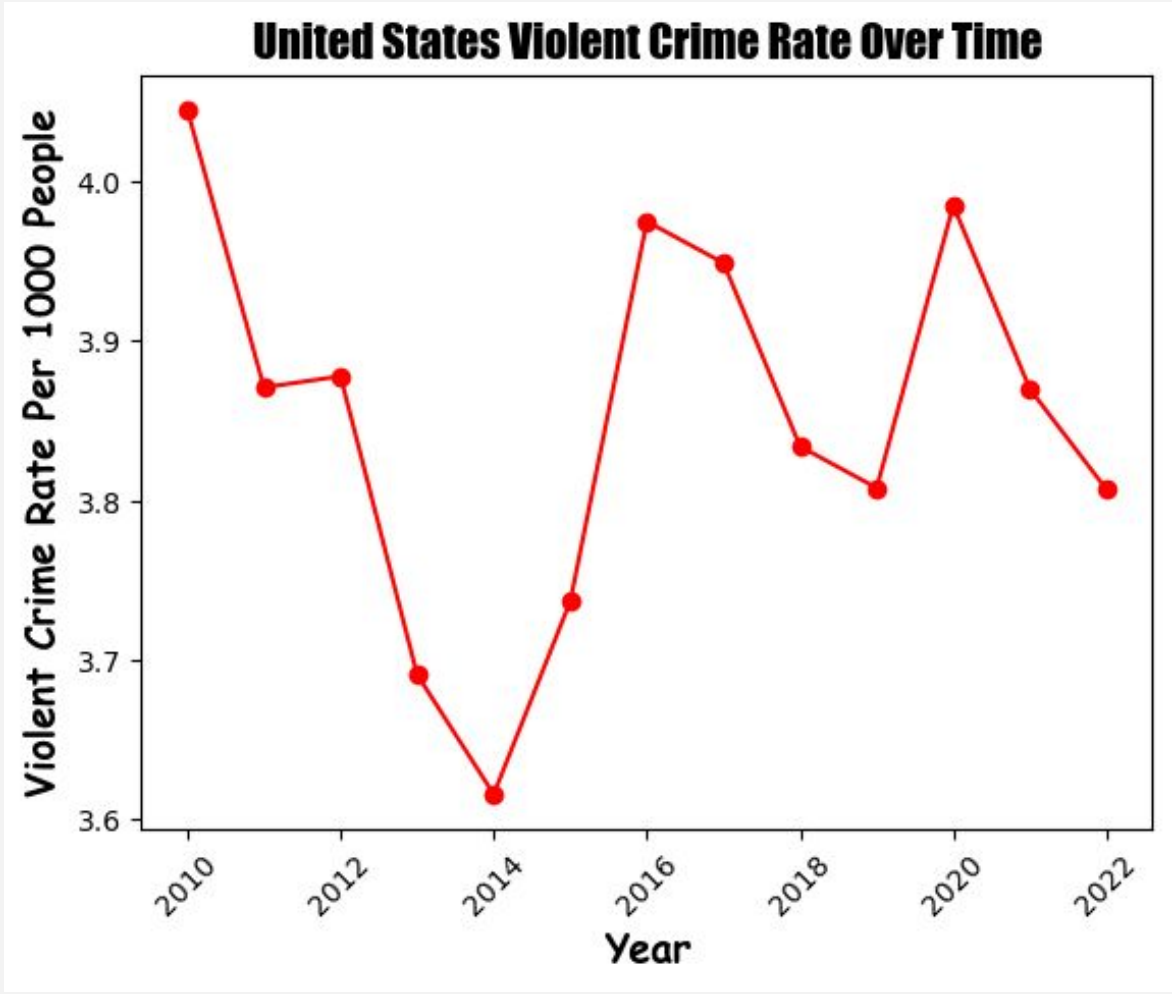


$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{N_1} + \frac{s_2^2}{N_2}}}$$

T-STAT: 0.19104
P-VALUE: 0.85089
WE FAIL TO REJECT THE NULL HYPOTHESIS AT A 95% CONFIDENCE LEVEL

Conclusion?

- Failed to find any correlation between the construction of casinos in a city and the overall city violent crime rates
- Possible indirect impact on criminal activities that is unable to be tracked in the data
- Could the sample city data be not representative of the entire population?


United States Violent Crime Rate Over Time
Violent Crime Rate Per 1000 People
4.0
3.9
3.8
3.7
3.6
2010
2012
2014
2016
2018
2020
2022
Year

Another T-Test!

Null Hypothesis

H_0: Our sample of cities is representative of the entire population ; $\overline{x}_{Sample} = \mu_{Population}$

Alternative Hypothesis

H_1: Our sample of cities is statistically different from the entire population mean; $\overline{x}_{Sample} \neq \mu_{Population}$

T-STAT: 1.70472
P-VALUE: 0.06332
WE FAIL TO REJECT THE NULL HYPOTHESIS AT A 95% CONFIDENCE LEVEL

Final Analysis

- Unfortunately failed on multiple occasions to find any potential correlation between the building of casinos within the city and the overall city wellness
- Casino impact may be limited to specific areas in larger cities like Baltimore and Columbus, not captured in data
- Absence of Evidence ≠ Absence of Impact

Discussion and Future Issues

- While our analysis indicates no significant difference in the city wellness before and after the casino construction, that does not mean that casino construction causes no harm

- Future research could also explore how the construction and promotion of casinos can lead to other dangerous trends within the city area such as increase in substance abuse, financial instability, health concerns, and prostitution

Questions?

Sources

https://cde.ucr.cjis.gov/LATEST/webapp/#/pages/explorer/crime/crime-trend

https://www.geoapify.com/geocoding-api?gad_source=1&gclid=Cj0KCQjwiYOxBhC5ARIsAIvdH53ePeQSM6BB7_Uc9-EXiZRU8SGCNmHpeD2C7fMUhNvSevY20U3DtkkaAozTEALw_wcB