



Crime Analysis

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Summary

- Scope: Explores and analyzes crime data at both localized (State of Maryland) and nationwide levels in the US.
- Primary Focus: Compares rates of violent and non-violent crimes with economic indicators like inflation and unemployment rates.
- Objective: Aims to uncover significant correlations or trends between crime rates and economic conditions.





Project Overview

Data Sets Utilized

- US Crimes Data Set July 2016 to August 2022 (MD only)
- US Crime Rates 1960-2014 (no states ID'd)
- Global Inflation Dataset (1970-2022)
- Unemployment dataset

Evaluation and Analysis

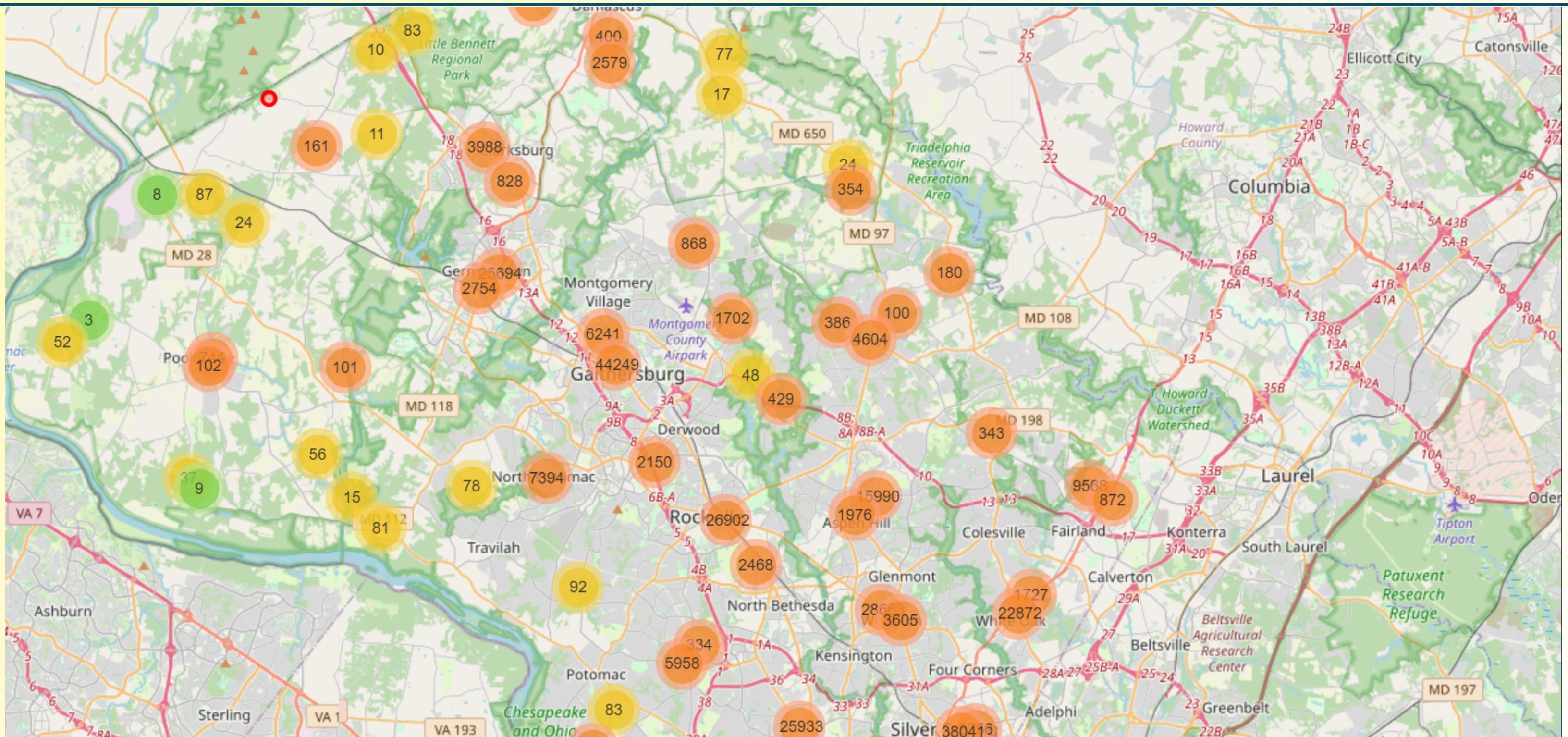
After choosing and evaluating the (4) data sets, it was determined that:

1. A heat map may be a helpful visual representation since the MD only data set includes detailed location information.
2. A correlation analysis may be useful to describe the relationship between Crime Rates (both violent and non-violent), Inflation, and Unemployment.
3. Prophet and Simple models could be utilized for forecasting/predictions.



Arizona State University

MD HEAT MAP





US Crime Trends (1960-2014)

Non-Violent

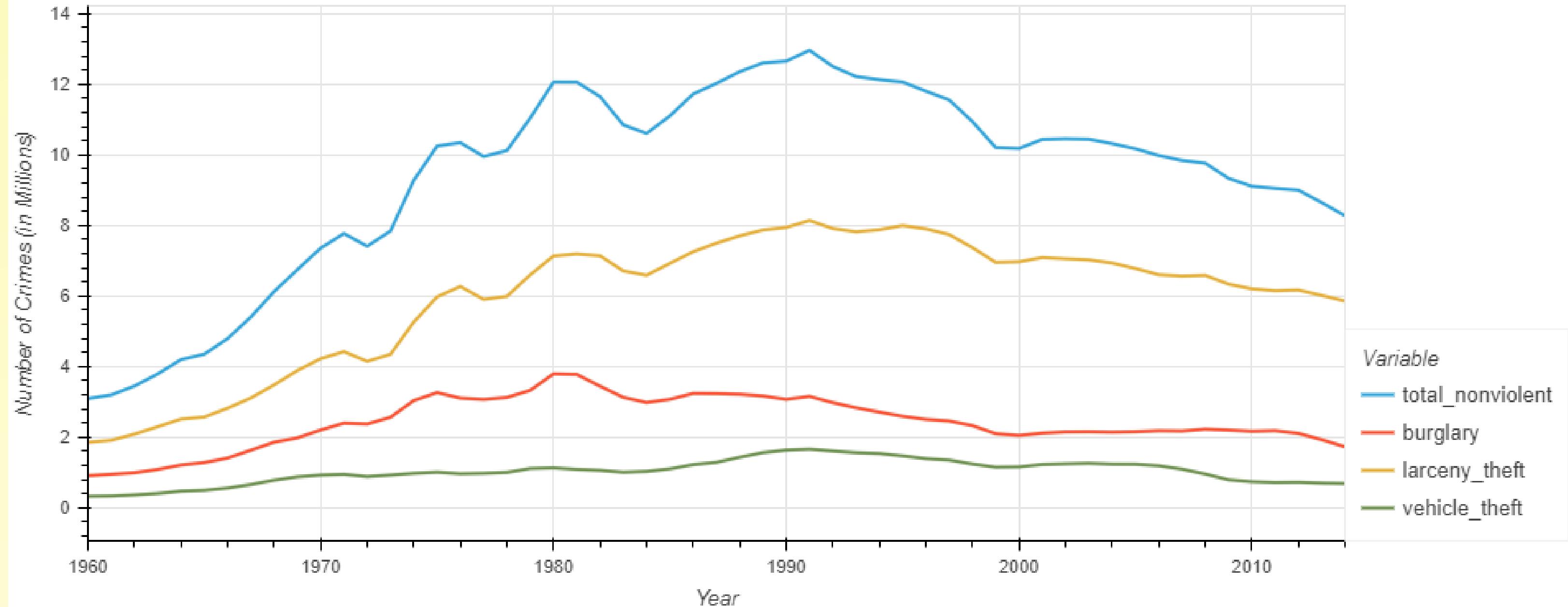
- Non-violent crimes showed a steady increase from 1960 through the early 1990s. There has been a small downward trend from the peak in 1991 but remains higher than pre-1974.

Violent

- Murder has reported steady results over the time span.
- Forcible rape showed an initial uptick in the late 1970s but has remained steady.
- Robbery and aggravated assault showed a steady increase through the early 1990s. There has been a small downward trend.
- Total violent crime has remained relatively steady over the timespan.

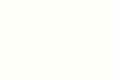
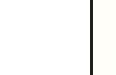
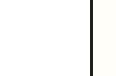
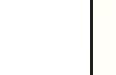
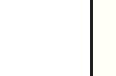
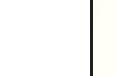
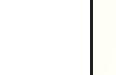
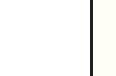
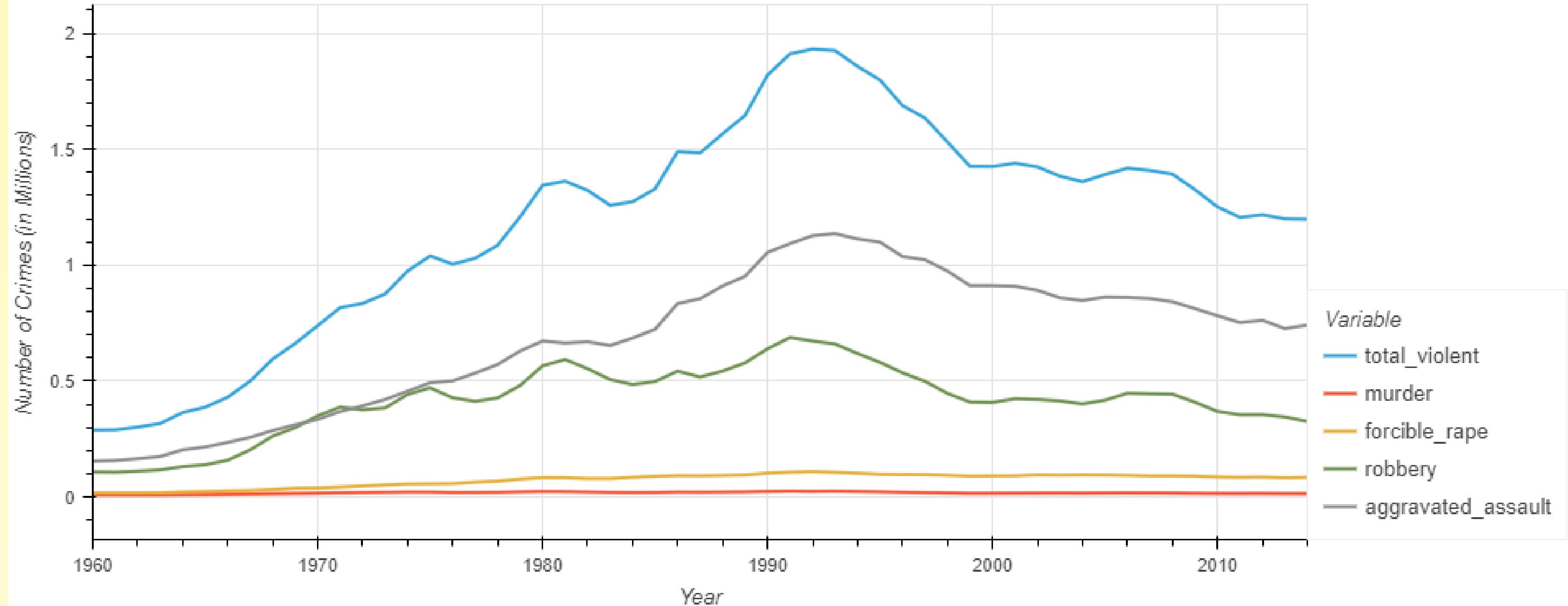


NON-VIOLENT CRIME



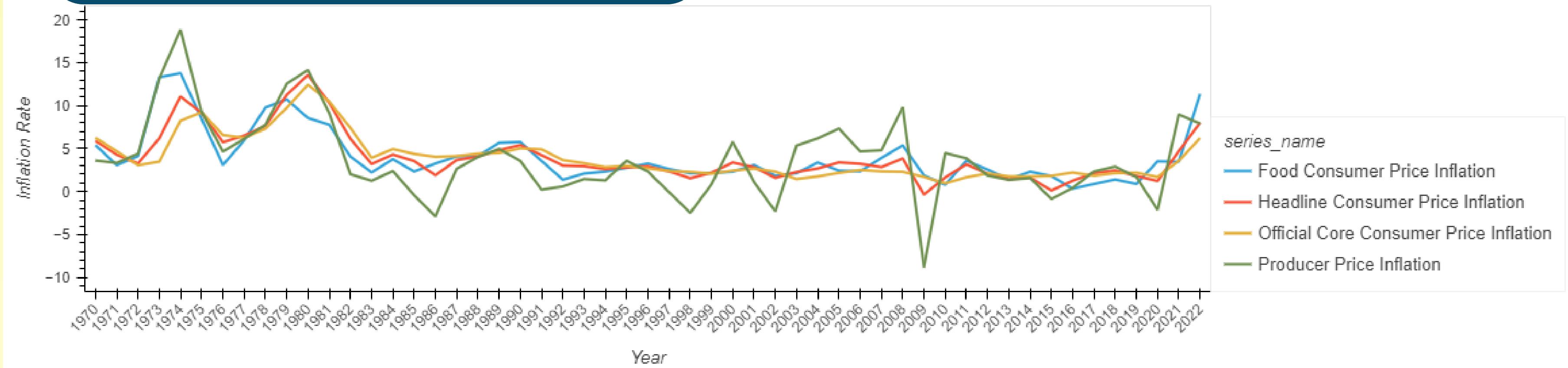


VIOLENT CRIME





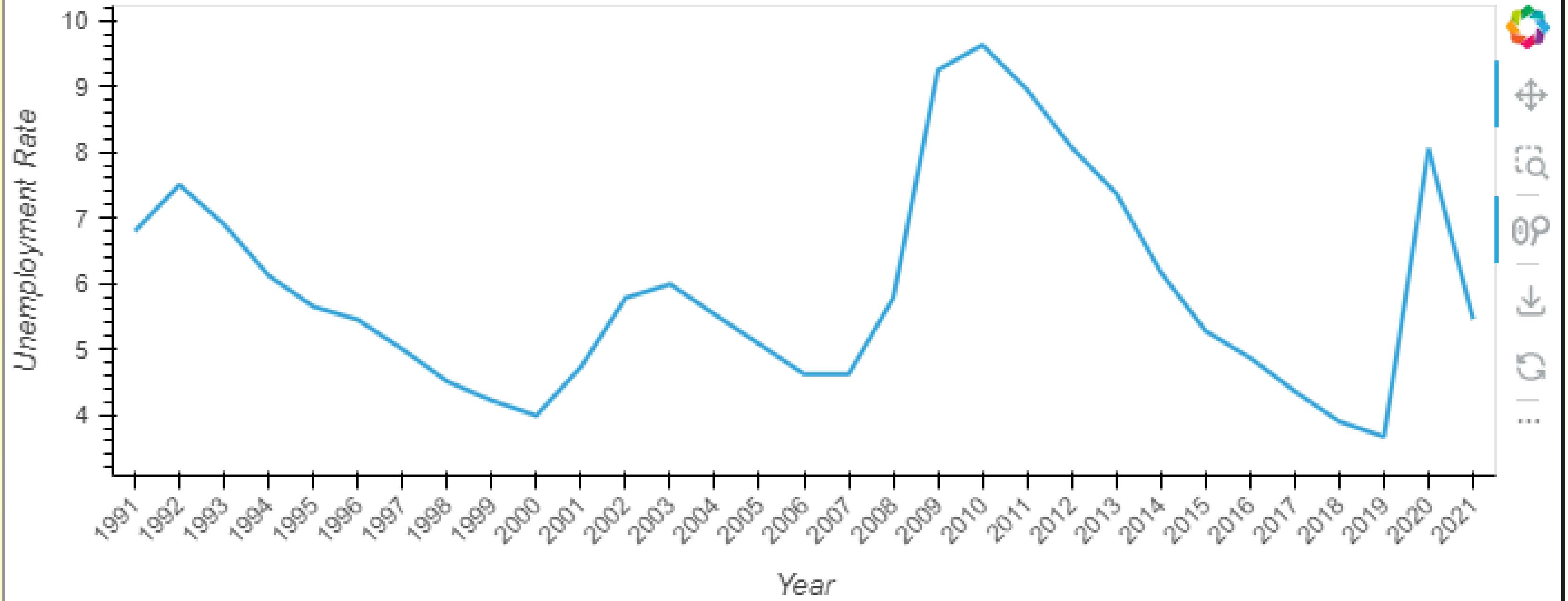
US INFLATION RATE (1970-2022)



- Global data was filtered to the United States only.
- All 4 indexes trended similarly throughout the time period with peaks approximately 1974, 1980, and 2022. In general, after 1980 the inflation rates while fluctuating did trend lower until 2021.



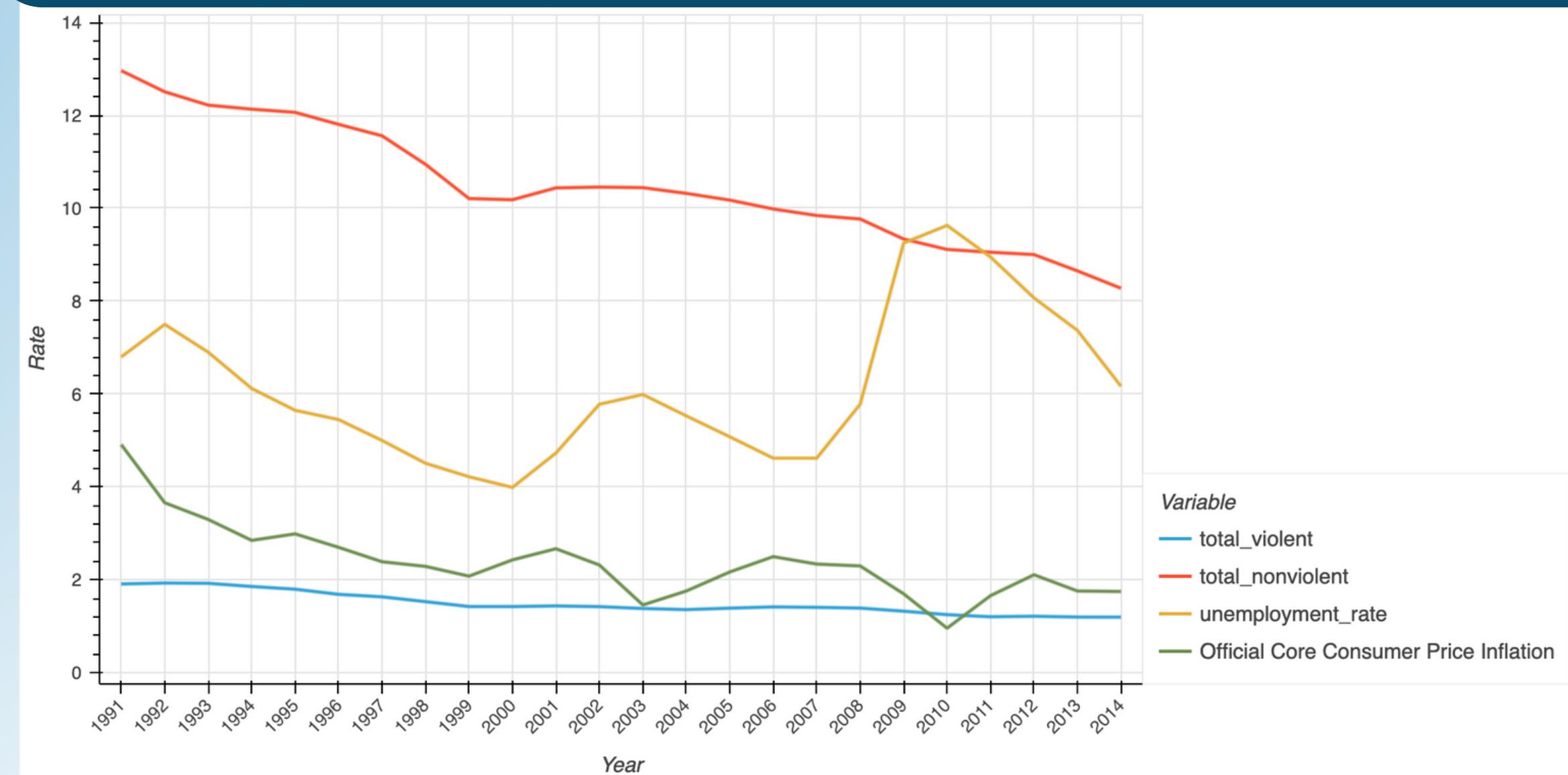
UNEMPLOYMENT (1991-2021)



- Also filtered to the United States only.
- Lowest points occurred in 2000 (3.990) and 2019 (3.670).
- Highest points occurred in 2010 (9.630) and 2020 (8.050).



CRIME, UNEMPLOYMENT, AND INFLATION (1991-2014)



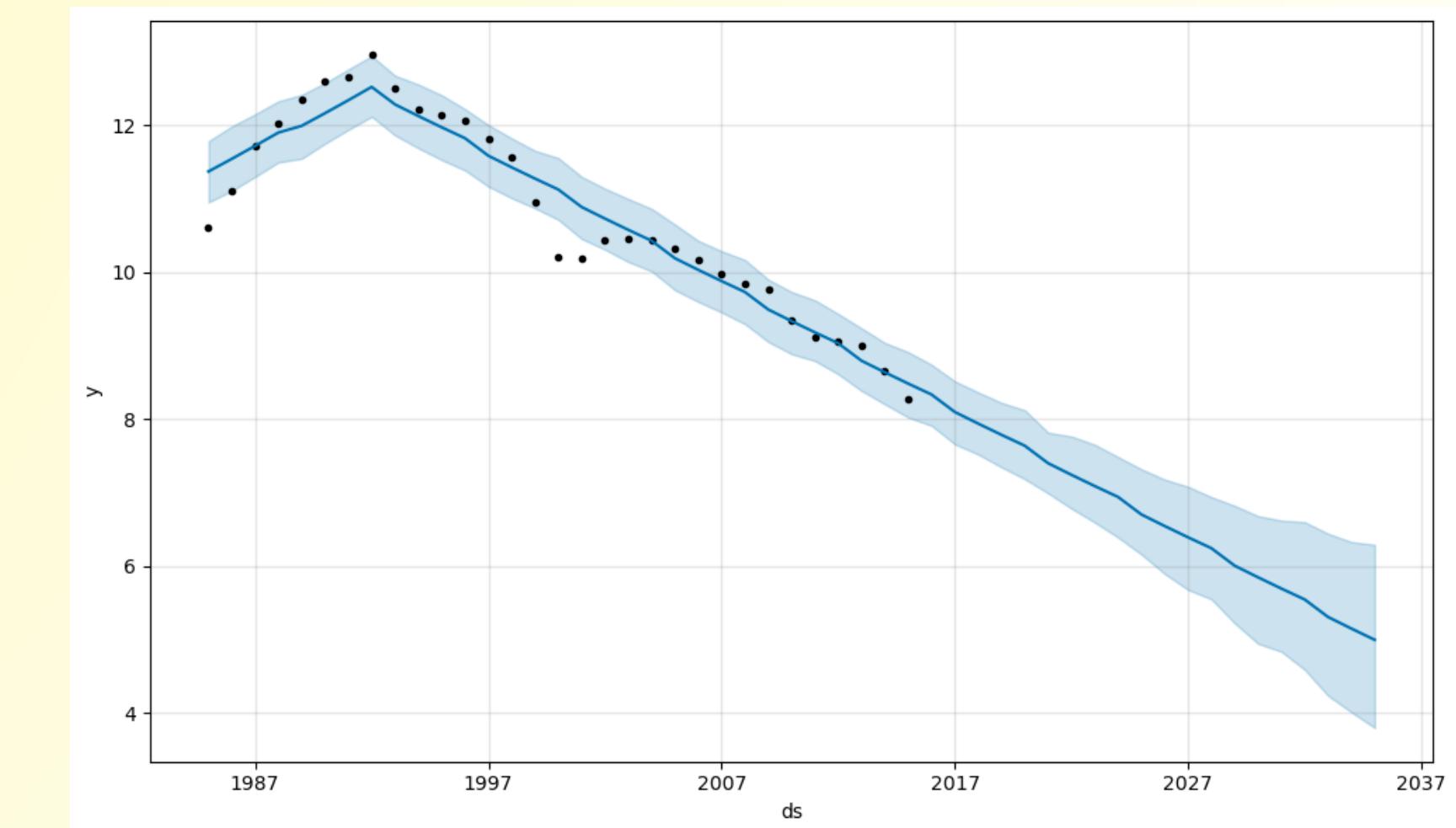
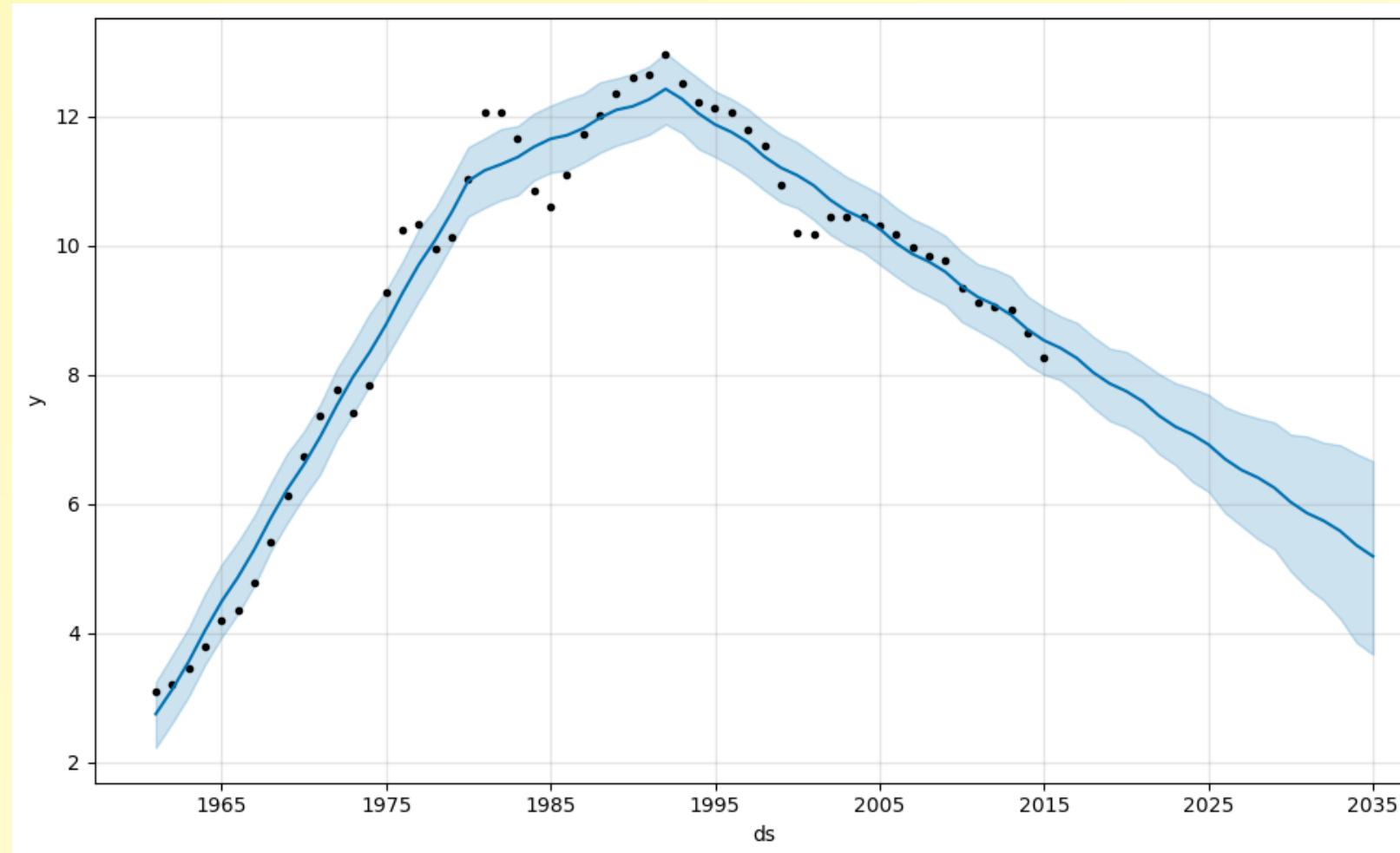
Correlation Matrix	total_violent	total_nonviolent	unemployment_rate	Official Core Consumer Price Inflation
total_violent	1.000000	0.970238	-0.171216	0.840357
total_nonviolent	0.970238	1.000000	-0.247883	0.813683
unemployment_rate	-0.171216	-0.247883	1.000000	-0.200273
Official Core Consumer Price Inflation	0.840357	0.813683	-0.200273	1.000000



NON-VIOLENT CRIME

PROPHET (1960-2014)

PROPHET (1984-2014)



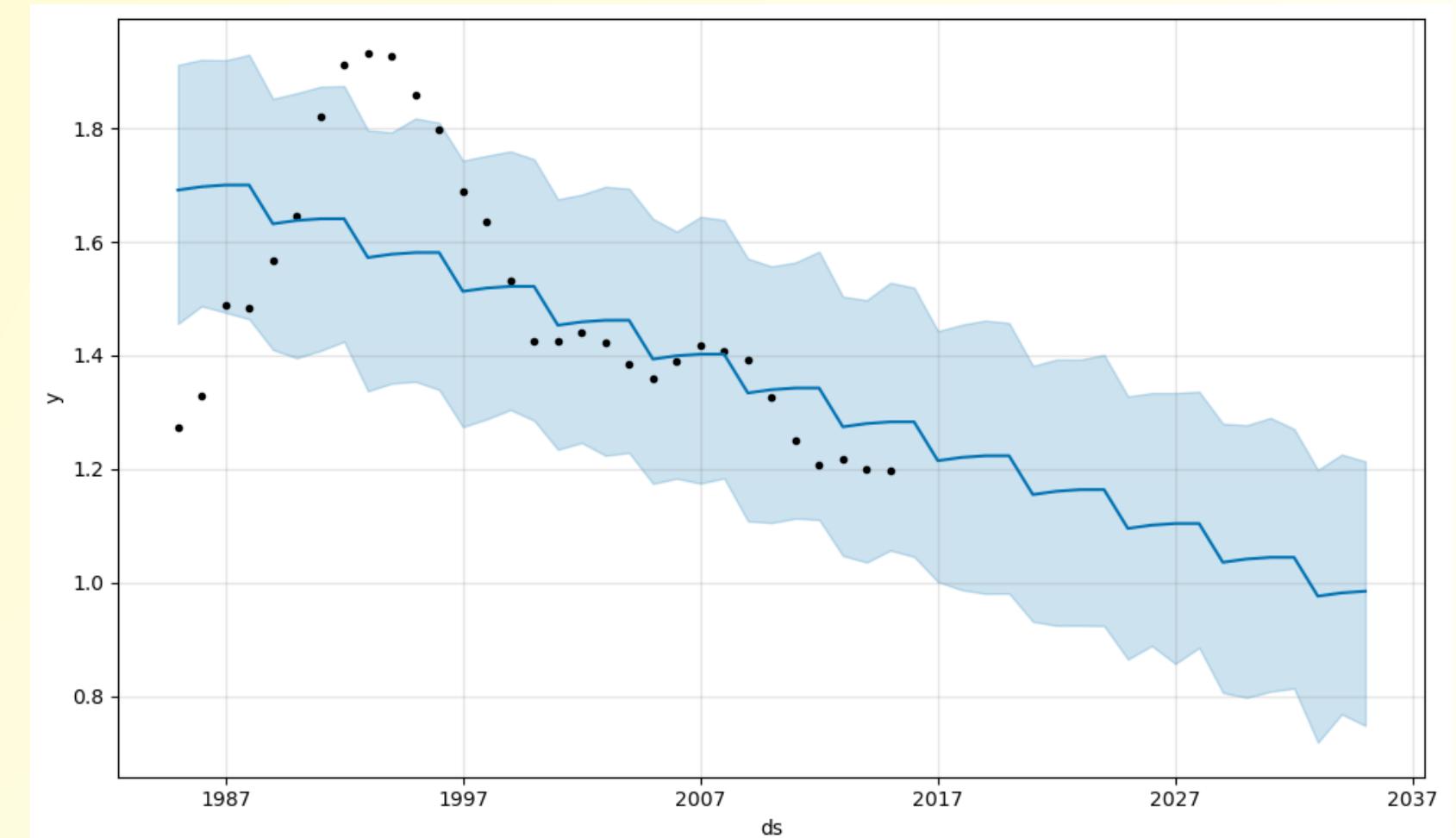
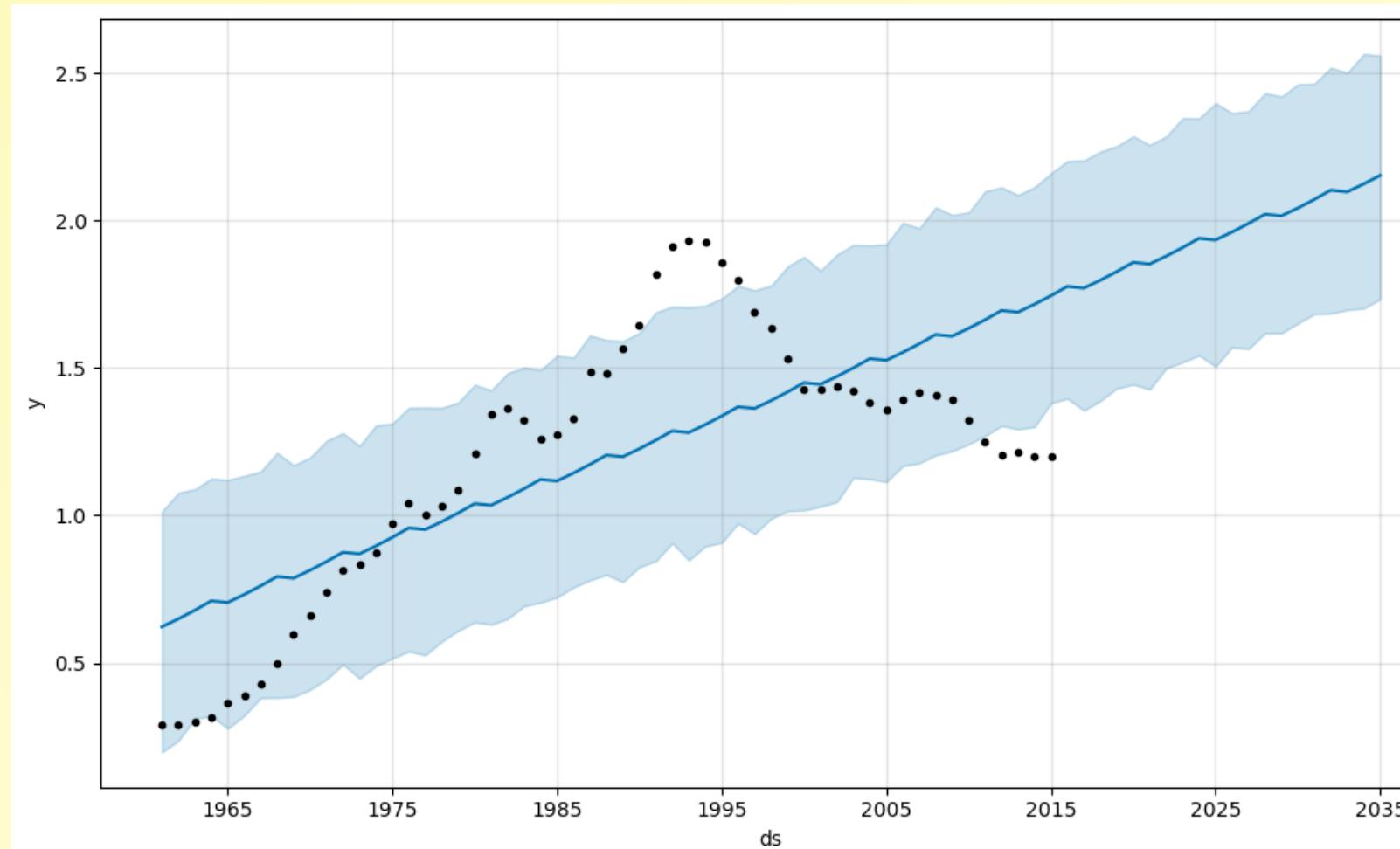
- When using the full date range, prophet predicted non-violent crime to decrease in the future.
- When filtering the date range for the last 30 periods (years), prophet predicted non-violent crime to decrease in the future.
- There was no meaningful change in prophet predictions on this data set by changing the dates.



VIOLENT CRIME

PROPHET (1960-2014)

PROPHET (1984-2014)



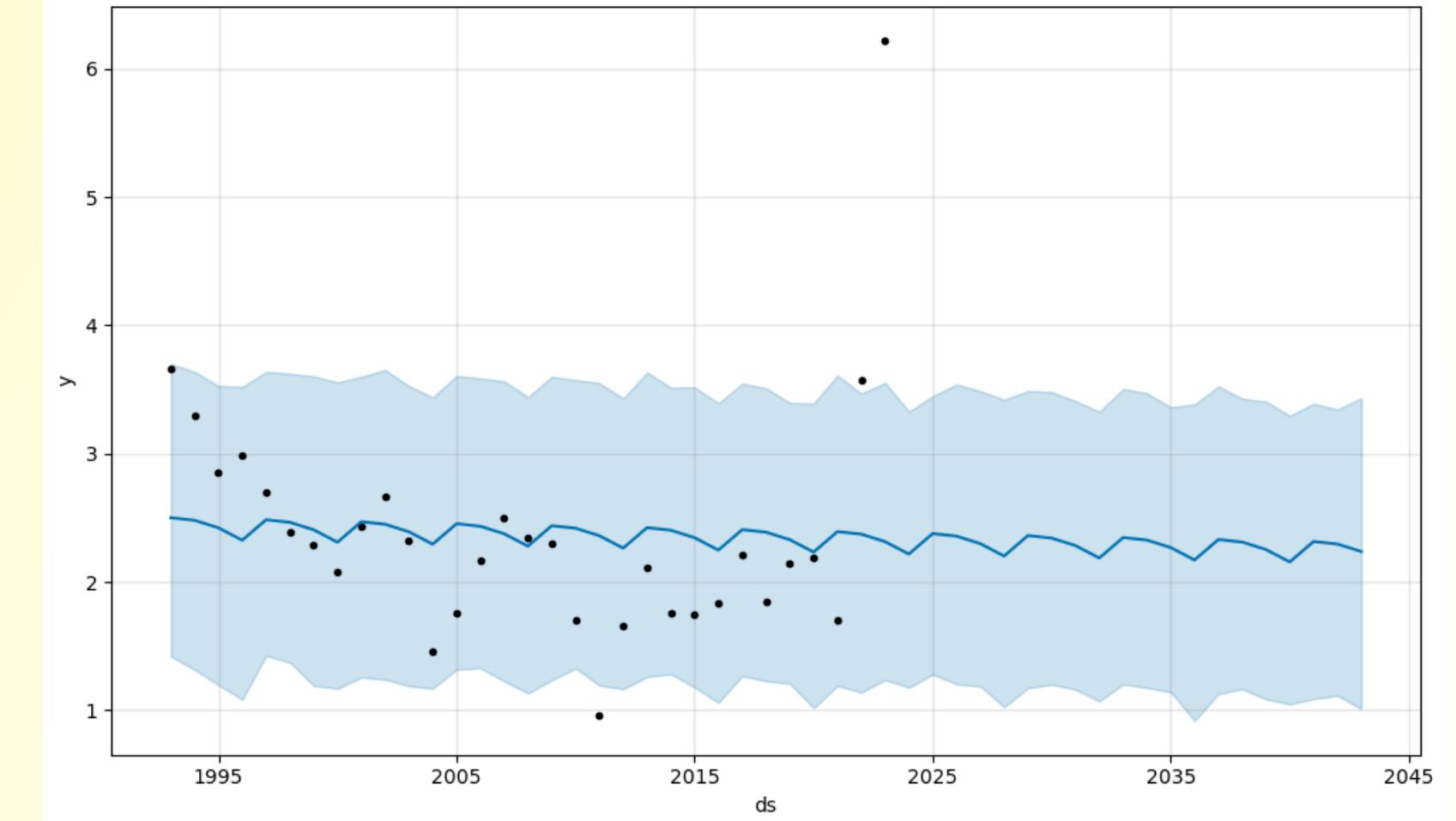
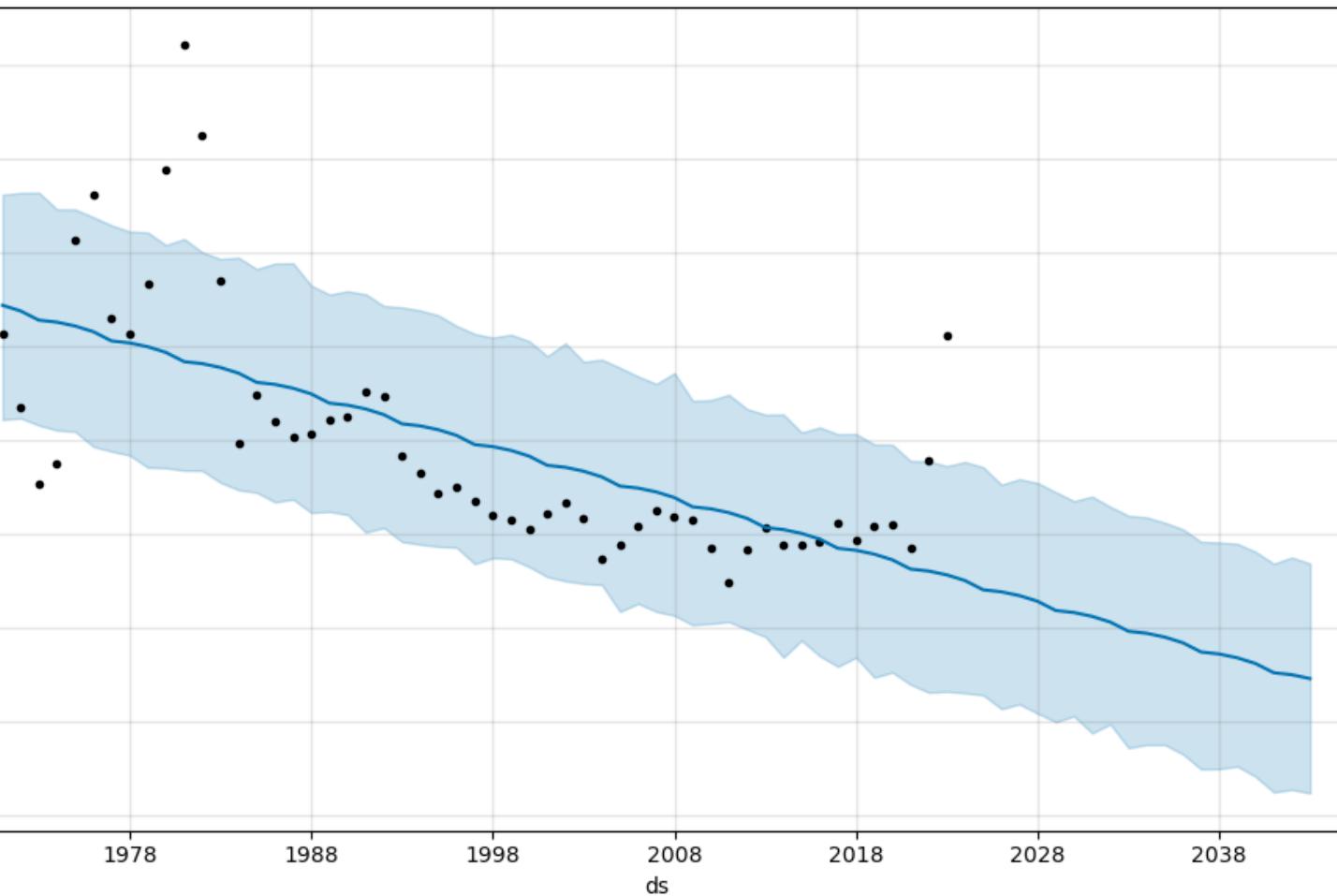
- When using the full date range, prophet predicted violent crime to increase in the future. Prophet interpreted the most recent data points as outliers.
- When filtering the date range for the last 30 periods (years), prophet predicted violent crime to decrease in the future.



INFLATION RATE

PROPHET (1970-2022)

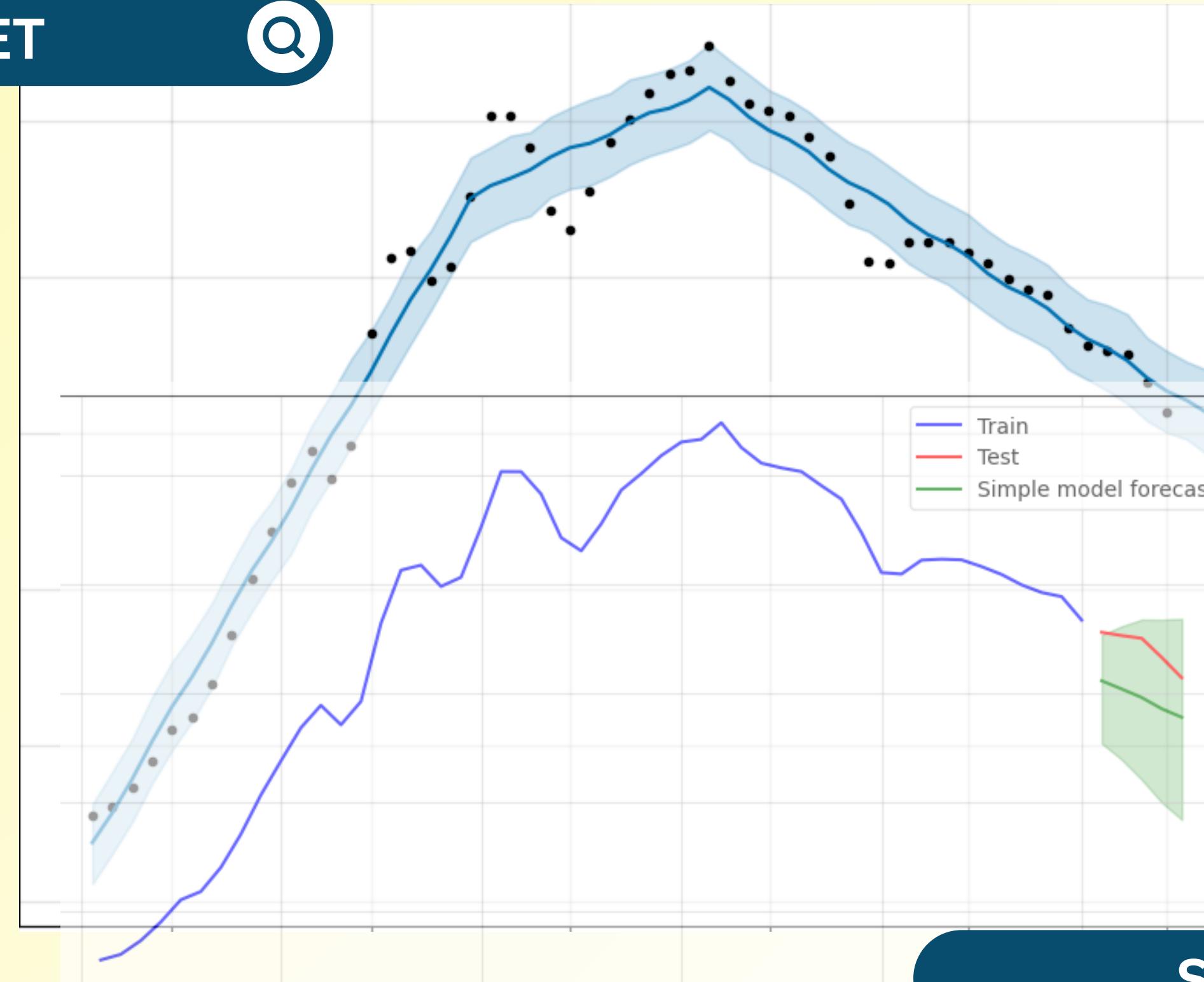
PROPHET (1992-2022)



- Prophet predicted that inflation would continue to decline in future years and would reach negative inflation.
- When filtering the date range for the last 30 periods (years), prophet predicted significantly different results. Overall it showed consistent low inflation to continue to trend in the future. While the data had shown inflation rise in 2021, prophet interpreted this as an outlier.
- Conclusion, limiting the data set to a more limited time span can have significantly different results. In addition, prophet has limited application on a dataset that is influenced by other factors. It is best for seasonal patterns.

NON-VIOLENT CRIME

PROPHET

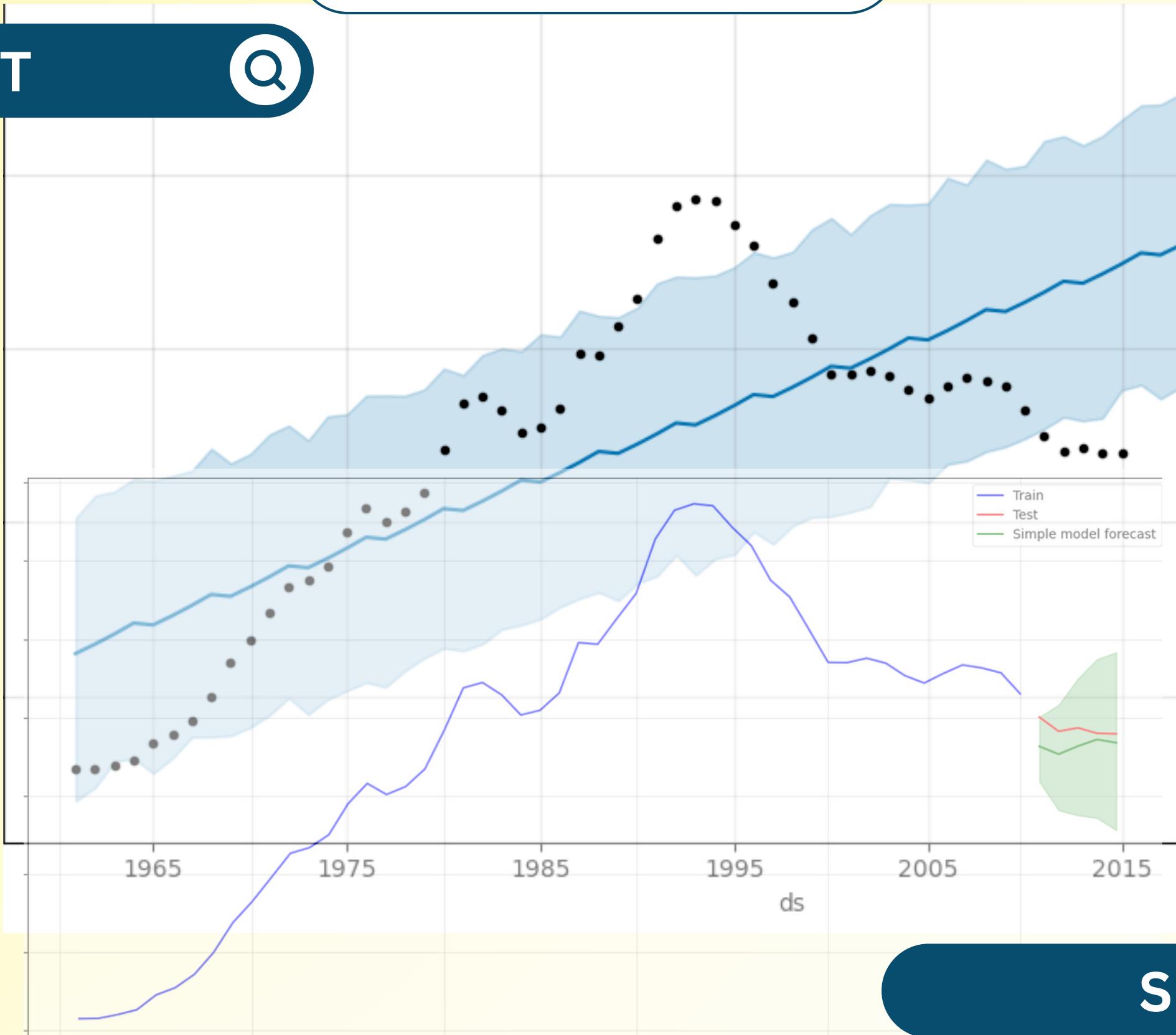


SIMPLE



VIOLENT CRIME

PROPHET



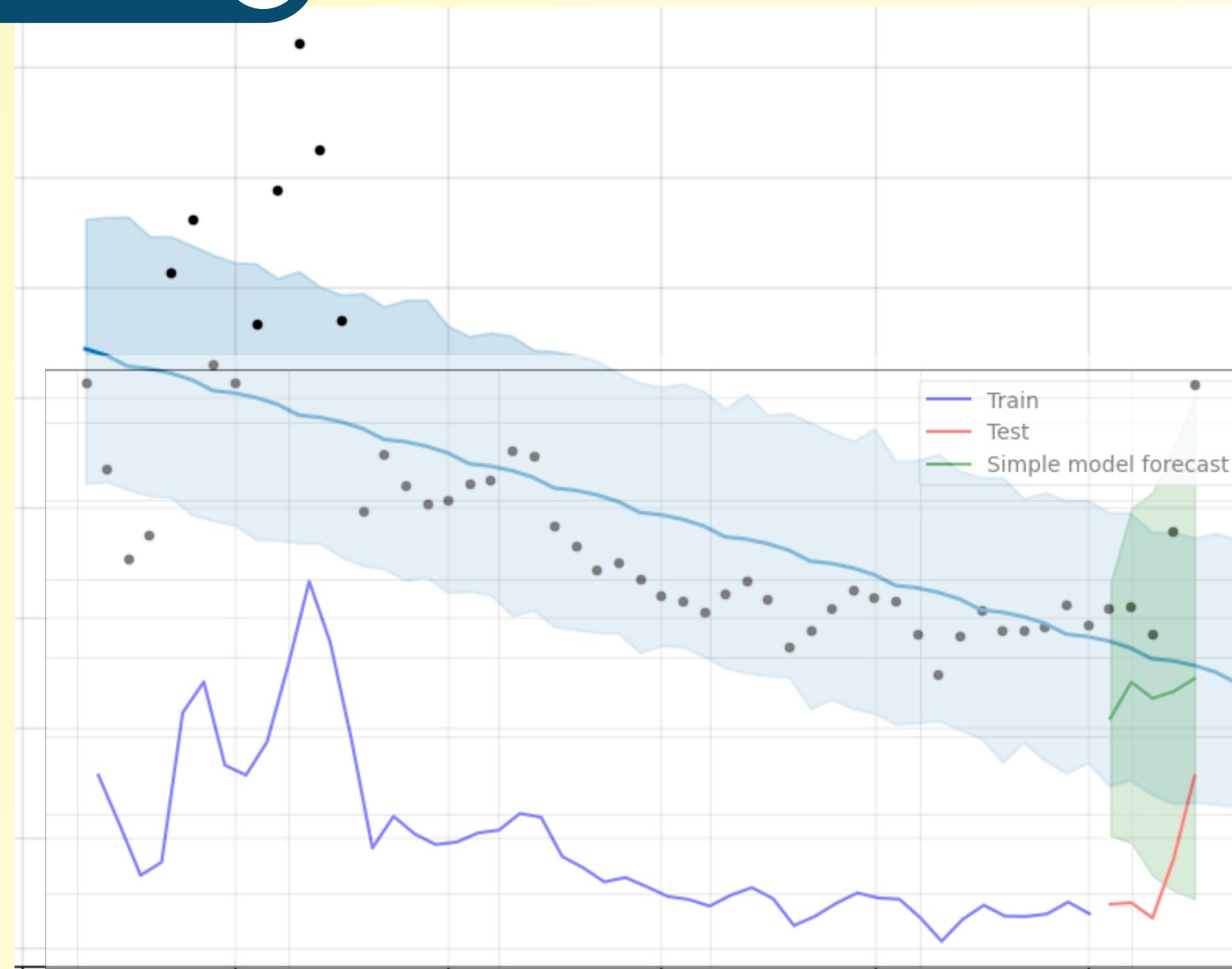
SIMPLE



INFLATION RATE



PROPHET



SIMPLE





In Conclusion

INSUFFICIENT COMPREHENSIVE QUALITY DATA

INADEQUATE VOLUME

LIMITED CONFIDENCE LEVEL

And

Finally

The background features a stage set with heavy red curtains on either side. Two large, bright yellow spotlights are positioned at the top corners, casting a warm glow. The stage floor is a dark purple color.

**WHERE ARE OUR
GRADES?**

THANK YOU



The Floor Is Now Open For Questions