

Behind Bars and Beyond: Investigating Socioeconomic Drivers of Incarceration Rates in the United States*

A comparative analysis of global trends and America's mass incarceration crisis.

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Abstract

Over the past five decades, the United States has witnessed a decline in the percentage of adults residing in middle-class households, alongside escalating concerns about housing affordability. This study aims to assess the impact of rising costs on the living standards of middle and lower-income households, recognizing them as the most affected demographic by these economic shifts. Utilizing data from [...], we analyze changes in income distribution and evaluate the influence of economic policy changes, including interest rates and taxation, on the standards of living of these individuals. Additionally, we explore how individual-level characteristics intersect with these policies to address how best to pursue the goal of economic equity across individuals of all backgrounds. We find that [...].

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*Code and data are available at: <https://github.com/AbbassSleiman/US-Middle-Class>.

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1 Introduction

In recent decades, the United States has grappled with a consistent rise in its prison population, becoming infamous for having one of the highest incarceration rates in the world. Leading the world with nearly 2 million individuals in prisons and jails in 2022, the US is faced with what, at first glance, appears to be a “uniquely American problem” (Galea 2022). This phenomenon has sparked widespread concern and debate over how best to address this issue. Central to these discussions is the question of what underlying factors have contributed to this circumstance, in turn necessitating an exploration of the socioeconomic drivers of incarceration rates in the United States.

Incarceration refers to the state of being confined in prison as punishment for criminal offences (Review 2024b), and in examining the United States’ prison dilemma, it becomes clear that the crux of the problem is not easily reducible to simple explanations. Instead, it is a complex issue influenced by a multitude of factors including cultural dynamics and socioeconomic conditions. Thus, in an attempt to unravel the intricacies of these factors, this paper seeks to conduct a comparative analysis of global trends in education, unemployment, crime, and poverty rates as independent factors influencing a nation’s incarceration. However, recognizing that the total number of incarcerations is heavily dependent on population size, this paper focuses on nations’ incarceration rates as the estimand, defined to be the number of incarcerated individuals per 100,000 in a given population (Review 2024b), which serves as a better metric for measuring the extent of imprisonment within a society. By exploring the impact of these factors on incarceration rates, we aim to better understand the primary forces behind the United States’ high incarceration rate and overall number of individuals incarcerated. This understanding will help inform policy-making decisions aimed at addressing the issue effectively.

This paper utilizes various datasets from the World Population Review, in particular it utilizes their datasets on “Incarceration Rates by Country 2024”, “Poverty Rate by Country 2024”, “Education Rankings by Country 2024”, “Unemployment by Country 2024”, and “Violent Crime Rates by Country 2024”. By conducting statistical analyses with the aforementioned data, this paper finds evidence to suggest that [...]

The remainder of this paper is structured as follows. Section 2 discusses the raw data, cleaning process, variables of interest, and offers visual representations of the data through tabular and graphical representations of the observations. Section 3 introduces and justifies the Bayesian linear regression model used in the analysis of the data in predicting the relationship between the aforementioned independent variables and a nation’s incarceration rate. Section 4 deals with analyzing the trends and correlations showcased by the model in more detail. Section 5 discusses the real-world implications of the results uncovered in the prior sections, and finally Section 6 discusses the limitations and weaknesses of the analysis conducted, as well as the next steps that could be taken to improve the overall reliability of the paper.

2 Data

This paper utilizes 5 datasets, all provided by the World Population Review and each providing information on one of the 5 factors involved in this study. The incarceration rate dataset (Review 2024b), Section 2.1, features the most recently available information on incarcerations and incarceration rates of 219 countries and territories as of 2024. The poverty rate dataset (Review 2024c), Section 2.2, features the data on the poverty rates of 164 nations. The violent crime rate dataset (Review 2024e), Section 2.3, features data on the number of various types of violent crimes in each of 200 nations and territories per 100k members of the population. The unemployment rate dataset (Review 2024d), Section 2.4, features data on the unemployment rate in each of 226 countries and territories. Finally, the education ranking dataset (Review 2024a), Section 2.5, contains data on the literacy rate and education rank of each of 207 countries and territories, accurate as of 2024.

All data analysis was done through R (R Core Team 2023) with the aid of the following packages:

2.1 Incarceration Rate Dataset

The raw incarceration rate dataset contains information on the incarceration rate (per 100k population), total incarcerated, percentage of incarcerated that are female, and percentage of incarcerated that are male for 219 countries and territories. A snippet of the top 10 countries ordered by incarceration rate can be seen in Table 1, showcasing their rates of incarceration and total number of individuals incarcerated. It is important to note that, whilst the data provided is the most recent available for each nation, the data for each nation need not be accurate as of 2024 as varying nations may have data from different years.

Table 1: Top 10 countries by incarceration rate

Country	Incarceration Rate per 100k Population	Total Incarcerated
El Salvador	1086	71000
Cuba	794	90000
Rwanda	637	89034
Turkmenistan	576	35000
American Samoa	538	301
United States	531	1767200
Panama	499	22239
Guam	475	820
Palau	428	77
Uruguay	424	14965

2.2 Poverty Rate Dataset

The poverty rate dataset contains information on the poverty rates in 164 nations. In particular, it provides information on the percentage of the population living on less than 10 USD per day, less than 3.65 USD per day, the poverty rate, and the year the data was collected. Here, poverty rate is measured as the percentage of a given population living below that particular nation’s respective poverty line which is estimated based on population-weighted subgroup estimates from household surveys (Review 2024c). This is an important clarification to make as it ensures that a nation’s poverty rate is relative to the living costs in that particular nation, in turn reducing biases that could arise as a result of the vastly differing costs of living across various nations. This ensures that, in the analysis that shall follow, we are able to more accurately take into account income inequality relative to each particular nation. The top 5 countries ordered by poverty rate are showcased in Table 2, showcasing information on the poverty rate and year of data collection for each of the 5 countries.

Table 2: Top 5 countries by poverty rate

Country	Poverty Rate	Year Data was Collected
South Sudan	82.3	2016
Equatorial Guinea	76.8	2006
Madagascar	70.7	2012
Central African Republic	68.8	2021
Burundi	64.9	2013

2.3 Violent Crime Rate Dataset

The violent crime rate dataset contains violent crime statistics for 200 nations and territories across the globe. In particular, it contains data on the homicide rate, serious assault rate, sexual violence rate, kidnapping rate, and robbery rate for each of the nations, each of which is measured to be the number of incidents per 100k population. It also features information on the year each of the data points was collected. As with the other datasets, the year of data collection for each nation varies by nation, and thus some information is more recent than others.

An important note to make regarding this information is that the definitions for each of these crimes can vary significantly from nation to nation. What one nation may deem to be a serious offence can be nothing more than a misdemeanor in another. As a result, though the data provided is based on each nation’s own definition of a serious offence, the fact that we are still provided with a fairly well-rounded subset of violent crimes ranging from theft to murder will enable us to better understand what the overall rate of violent crimes per nation is comprised of. One should note that some countries have missing values for certain crime rates, indicated by an “NA”. Table 3 showcases a sample of 5 countries including information regarding the aforementioned crime rates for each.

Table 3: Sample of 5 countries and their respective rates of various violent crimes (per 100k population)

Country	Homicide Rate	Serious Assault Rate	Sexual Violence Rate	Kidnapping Rate	Robbery Rate
India	3.08	26.13	9.1	5.111	2.847
China	0.53	NA	NA	NA	NA
United States	4.96	246.84	NA	NA	86.244
Indonesia	0.43	4.18	2.1	0.083	3.147

Table 3: Sample of 5 countries and their respective rates of various violent crimes (per 100k population)

Country	Homicide Rate	Serious Assault Rate	Sexual Violence Rate	Kidnapping Rate	Robbery Rate
Pakistan	3.88	12.51	1.8	9.452	7.027

2.4 Unemployment Rate Dataset

The unemployment rate dataset provides data on the unemployment rates of 226 countries and territories across the globe according to 3 various sources: the World Bank, the International Labour Organization, and the CIA, as well as the respective years that each of these organizations collected the data. Here, unemployment is defined as the percentage of unemployed workers in the labour force, which includes those who do not currently work but are able to do so (Review 2024d). It is important to note that, as with the other datasets, information on the nations’ unemployment rates is not necessarily accurate as of 2024 and the date of collection varies from country to country. As the World Bank has information on every one of the countries and territories, this paper will utilize only data from that one source regarding unemployment rates. Table 4 showcases the top 5 countries by highest unemployment rates, according to the World Bank, as well as the year the data was collected.

Table 4: Top 5 countries by highest unemployment rate (as per the World Bank)

Country	Unemployment Rate	Year Data was Collected
South Africa	28.8	2022
Tuvalu	26.6	2017
Djibouti	26.1	2017
Equatorial Guinea	25.0	1983
Palestine	24.4	2022

2.5 Education Ranking Dataset

The education ranking dataset provides information on the literacy rate and education rank of 207 countries and territories. The dataset contains ranks assigned by various organizations, however the most recent ranking data is by the nonprofit World Top 20, who determine a nation’s rank according to a number of factors including early childhood enrollment rates, high school graduation rates, primary test scores, and various other factors (Project 2024). The top 5 countries according to the World Top 20 in 2024 are showcased in Table 5.

Table 5: Top 5 countries by education (World Top 20 (2024))

Country	Education Rank
South Korea	1
Denmark	2
Netherlands	3
Belgium	4
Slovenia	5

2.6 Cleaned Dataset

3 Model

3.1 Model set-up

3.1.1 Model justification

4 Results

5 Discussion

5.1 First discussion point

5.2 Second discussion point

5.3 Third discussion point

6 Weaknesses and next steps

Appendix

A Additional data details

B Model details

B.1 Posterior predictive check

References

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