

# **Title: Employment Rate in the United States**

Course: FFA 550A

## **Abstract**

I looked at the employment rate in the US from 2003 to 2024 as part of a statistical project for my data science coursework. Analyzing patterns in unemployment during this period and identifying important economic factors impacting these changes was the main objective of this study. This analysis sheds light on the cyclical nature of employment and how it correlates with different economic events, such as recessions and growth times, using data from the Federal Reserve Economic Data (FRED). The data visualization provides a thorough overview of employment dynamics in the United States over the past 20 years by revealing both long-term trends and short-term changes in unemployment rates using several graph types, such as line charts and bar graphs.

## **Introduction**

Understanding employment trends is essential in today's competitive labor market, particularly for college students getting ready to enter the workforce. Monitoring the employment rate offers important information on the state of the labor market, which has an immediate bearing on the opportunities that are open to recent graduates. When it comes to assisting students in determining whether the job market is advantageous or hard when they are ready to look for work, employment data in the US is a major factor.

This research examines patterns in unemployment in the United States from 2003 to 2024, offering a thorough picture of the impact of economic cycles on the labor market. Through an analysis of the effects of many economic elements, including recessions, periods of recovery, and growth, students can enhance their ability to evaluate the current market conditions and make well-informed decisions about their career choices. The employment data indicates potential obstacles for recent graduates joining the workforce by showing whether the market is growing and providing more opportunities or contracting.

## **Summary of Implementation Methods**

I used employment data from the Federal Reserve Economic Data (FRED), which offers detailed information on unemployment rates in the US for all racial and gender groups, for this analysis. Monthly unemployment rates from 2003 to 2024 are included in the dataset, which also shows the overall national unemployment rate and trends for several demographic groups.

I first aggregated the different subsets (by gender and race) to produce a single dataset that summarizes the general patterns before preparing the data for analysis. Preparing the data included sanitizing it by eliminating any missing information and making sure that the date formats were consistent. To facilitate comparisons across demographic groupings and historical periods, I additionally standardized the unemployment rates.

By processing the data in this way, I was able to visualize long-term employment trends while accounting for demographic variations. The processed data was then used to create multiple

graph types to help illustrate key insights and trends in the unemployment rate over the 21-year period.

## Types of Charts for Data Visualization

### Line Graphs

The general trends in unemployment from 2003 to 2024 were best displayed using line graphs, which also made important events like the COVID-19 epidemic and the 2008 financial crisis stand out. They made it simple to view changes over time by successfully capturing both long-term trends and short-term perturbations.

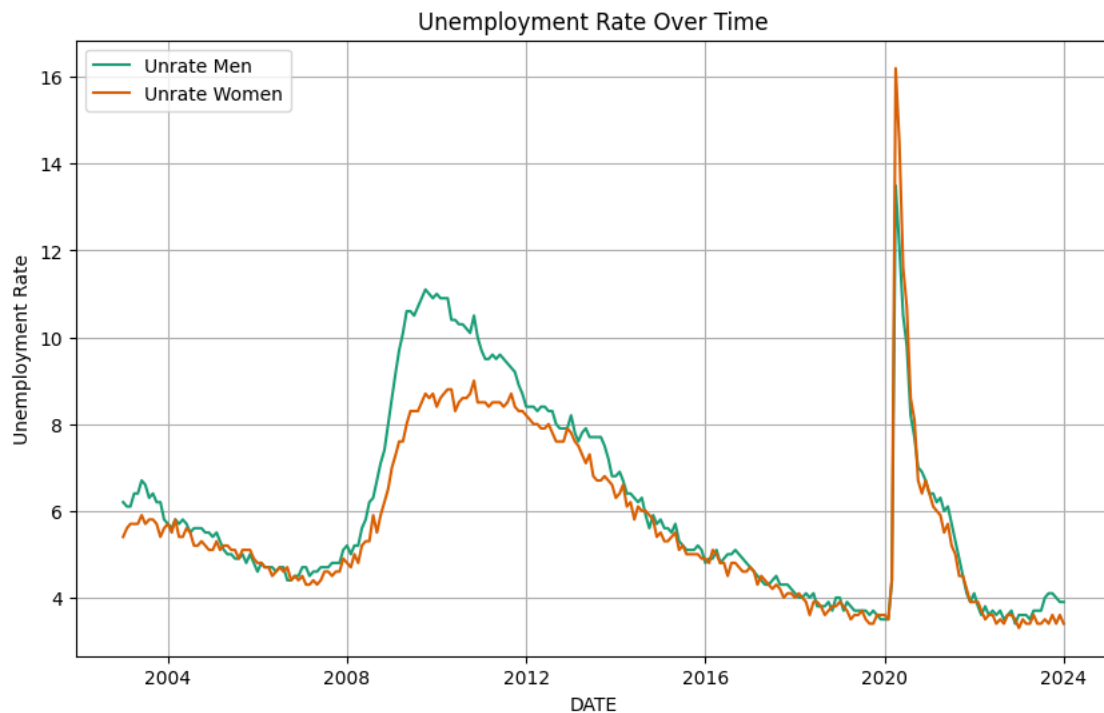


Figure 1: *Representing the unemployment rate in men and women.*

### Bar Charts

The unemployment rates for various demographic groups (race and gender) in particular years were compared using bar charts. This kind of graph made it simple to compare the differences in unemployment rates between different groups and determine which demographics were most impacted at different times.

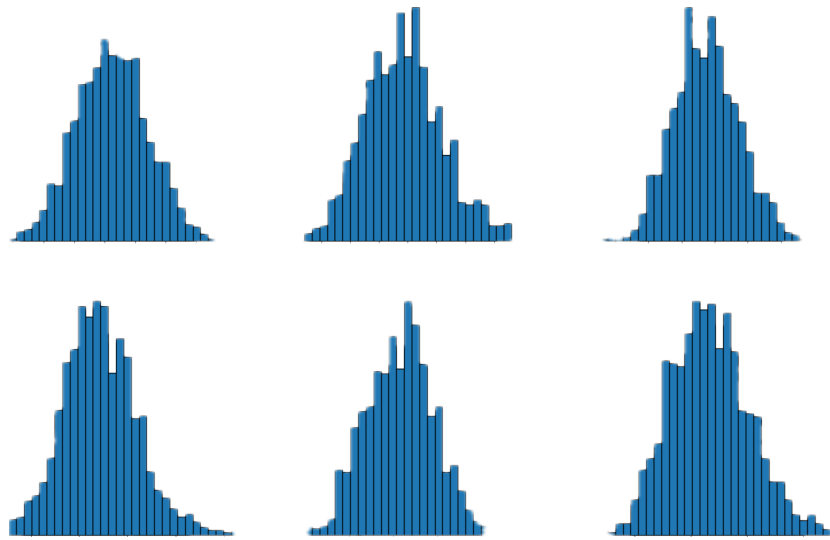


Figure 2: *Histogram representing the image of unemployment rates.*

### Dotted Charts

The link between the overall unemployment rate and the Asian unemployment rate is depicted in the dot graph above. The graph's y-axis displays the unemployment rate among Asians, while the x-axis displays data points for various time periods or geographical areas. Each dot on the graph represents a data point. A positive association between the two variables is suggested by the grouping of points along a diagonal pattern; greater general unemployment rates are correlated with higher Asian unemployment rates.

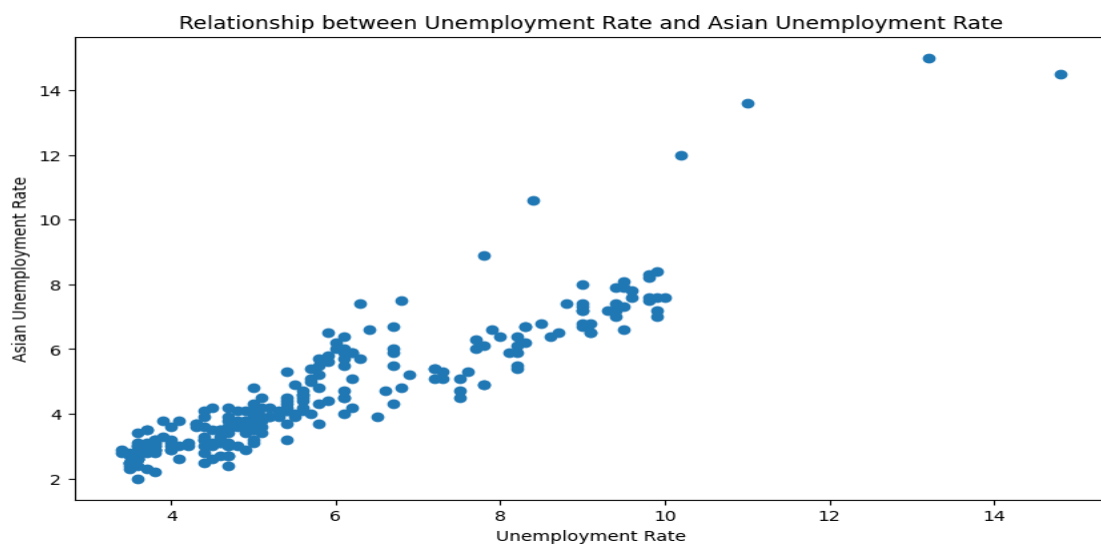


Figure 3: *A graph of a relationship between unemployment rate and Asian unemployment*

## Source

*CodeSource:* [https://colab.research.google.com/gist/jayantb11/f15c1944ad34c5b3d353d8e5b3ee7bdd/unemployment\\_rate.ipynb?authuser=1#scrollTo=xBE9JGyqxh1o](https://colab.research.google.com/gist/jayantb11/f15c1944ad34c5b3d353d8e5b3ee7bdd/unemployment_rate.ipynb?authuser=1#scrollTo=xBE9JGyqxh1o)

*Data Source:* <https://fred.stlouisfed.org/series/UNRATE>