# 612 PS5

February 12, 2025

## Data Exercises

1. The following FRED codes are for monthly U.S. unemployment rates, 1948m1 through current (2025m1), not seasonally adjusted, for individuals in the ages 20+ and the following categories:

   - Men: LNU04000025
   - Women: LNU04000026
   - White Men: LNU04000028
   - White Women: LNU04000029
   - Black Men: LNU04000031
   - Black Women: LNU04000032

   [The first three characters "LNU" are letters, the remainder are numbers.]

   (a) Fit simple seasonal dummy models for the two series "men" and "women." Plot fitted values for one year. You may plot the two on the same graph or separately. These fitted values represent the estimated seasonal patterns. Discuss whether the seasonality in unemployment rates is the same for men and women or if there are differences.

   **The seasonality patterns for men and women differ significantly. The men's unemployment rate reaches the highest point during Jan. and Feb, and the women's unemployment rate reaches the highest point during July. and Aug. From Jan. to Dec, for men, the trend initially declines, reaching its lowest point in October, before rising again, with the peak occurring in February. For women, the trend first decreases, then rises to its peak in August, followed by another decline.**

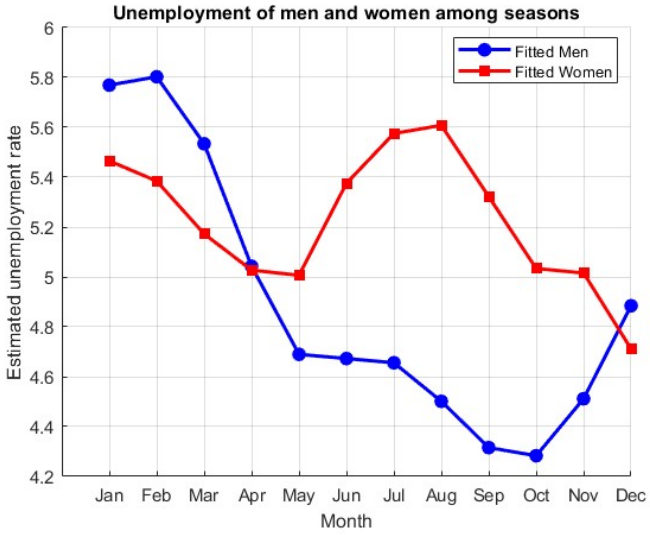


Figure 1:

(b)Fit simple seasonal dummy models for the four series: "white men," "white women," "black men," and "black women." Describe the similarities and differences between the estimated seasonal unemployment rate models for these four series.

**There are 2 main similarities. The first similarity is within each race. Overall, the pattern of the estimated seasonal unemployment rate for black men is similar to black women. Also, white men's estimated seasonal unemployment over seasons is close to white women's. Another similarity is related to gender. The estimated unemployment rates of black and white women reach their peak in July and Aug. Meanwhile, for black men and white men, the months with the highest estimated unemployment are Jan. and Feb. The difference is about different races. Overall, the estimated unemployment rates for black men and black women are much higher(over 5% in each month) than white men's and white women's. Another difference is about gender. Different gender among each race have a relative opposite trend of unemployment, meaning that there might be some substitution effects between male workers and female workers.**

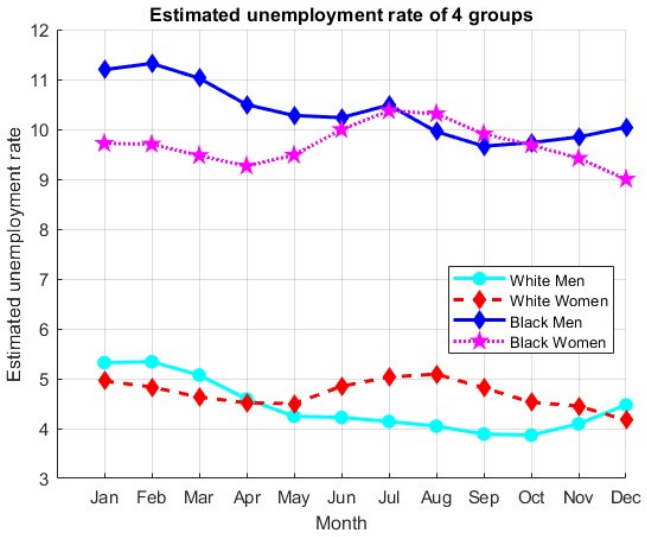


Figure 2:

2. In the January 2024 Employment Situation report, the Bureau of Labor Statistics stated: The seasonally unadjusted number of unemployed individuals increased from 5,907,000 in December 2023 to 6,778,000 in January 2024 (approximately 1 million increase). The unemployment rate increased from 3.5% to 4.1%. However, the seasonally adjusted number of unemployed individuals decreased from 6,268,000 to 6,124,000 (about 100,000 decrease). The seasonally adjusted unemployment rate remained roughly constant at 3.7%.

Are these numbers consistent? Was the BLS trying to mislead the public regarding unemployment trends? Explain.

**These numbers are consistent and BLS may not try to mislead the public because of the way of calculating adjusted data. The way of computing the seasonally adjusted unemployment is by summing the mean of unemployment and residuals (real data-seasonal pattern) in seasonality model. It is common for the residual to be positive or negative. Then, it possible that the seasonally adjusted data is higher than seasonally unadjusted data in some seasons where the residual is high and vice versa. Thus, it is possible that even though the unadjusted rate increases, the adjusted rate decreases.**