

## Data Exercise 1

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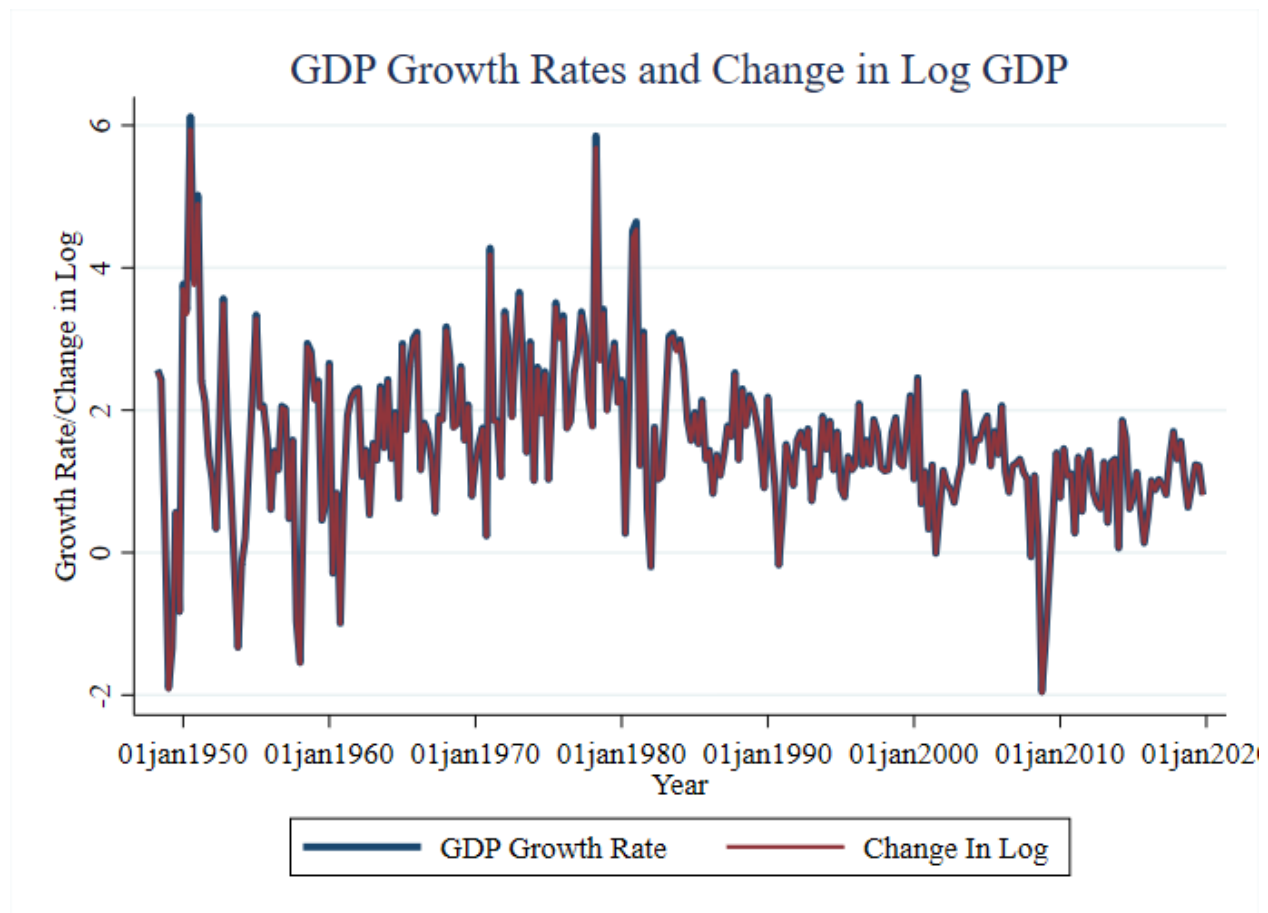
Econ-UH 2030 Intermediate Macroeconomics

Prof. Michael Reiter

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## Question 1

### Part 1.1

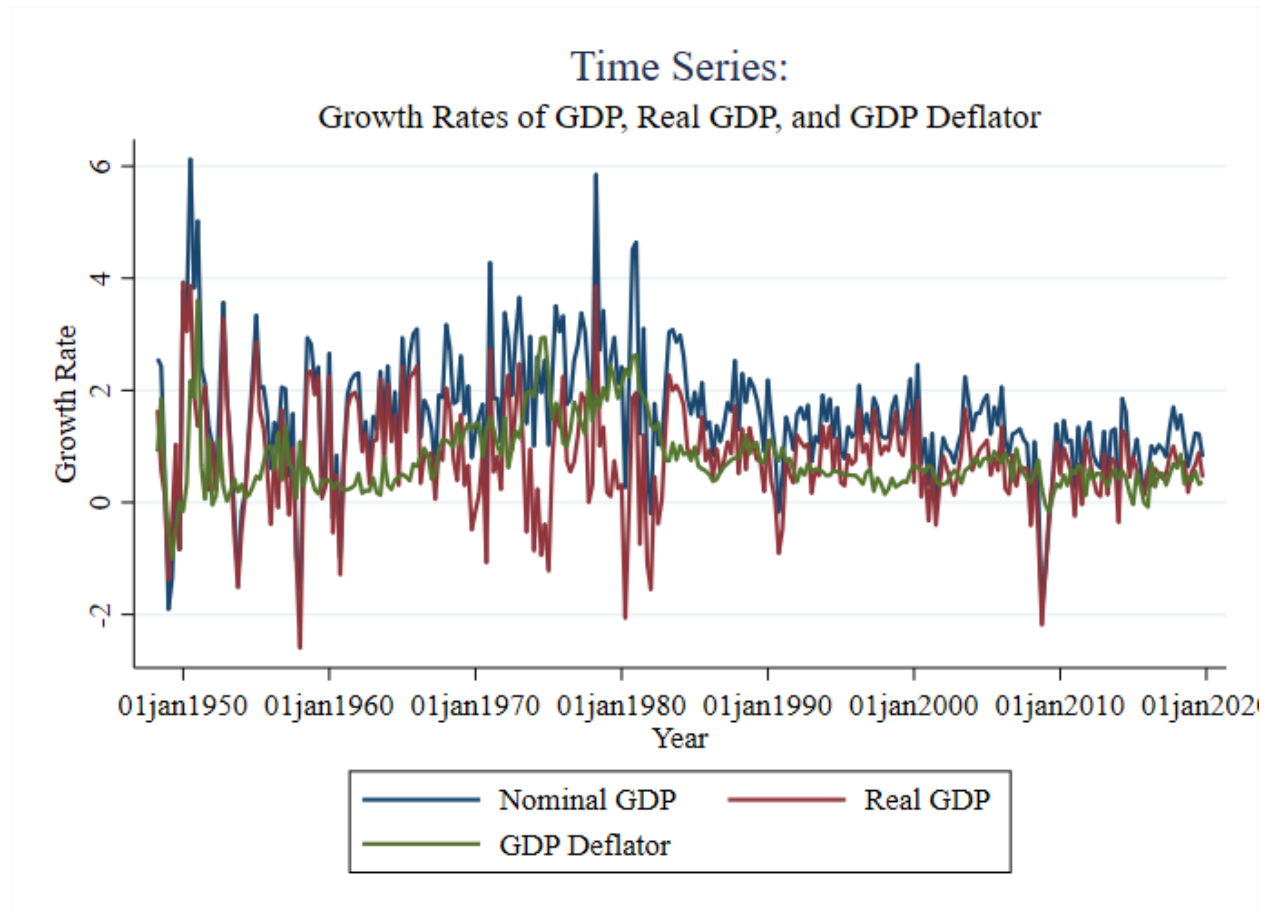


### Part 1.2

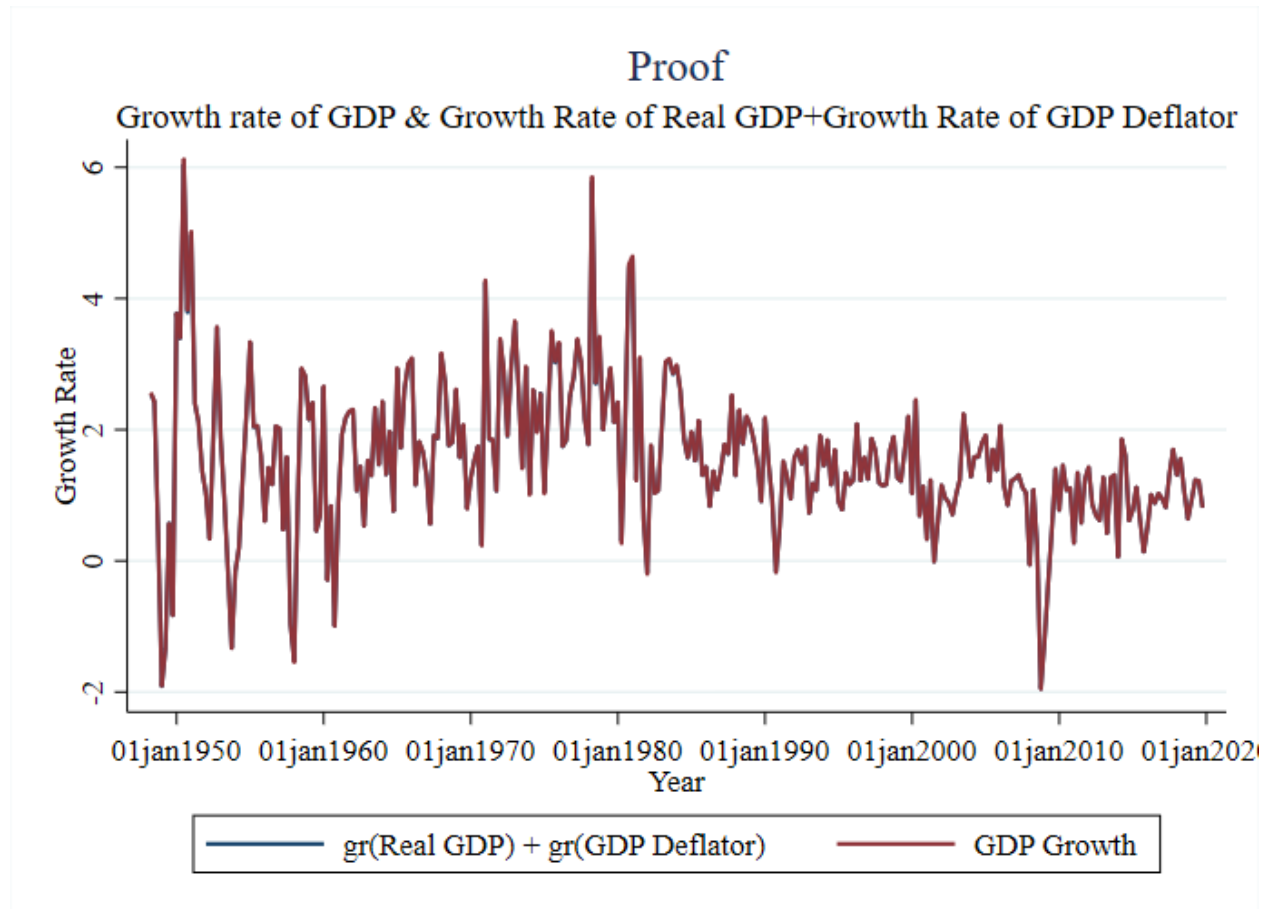
The growth rates of any variable are approximately equal to the difference of logarithms of those variables. Therefore, the lines overlap significantly.

## Question 2

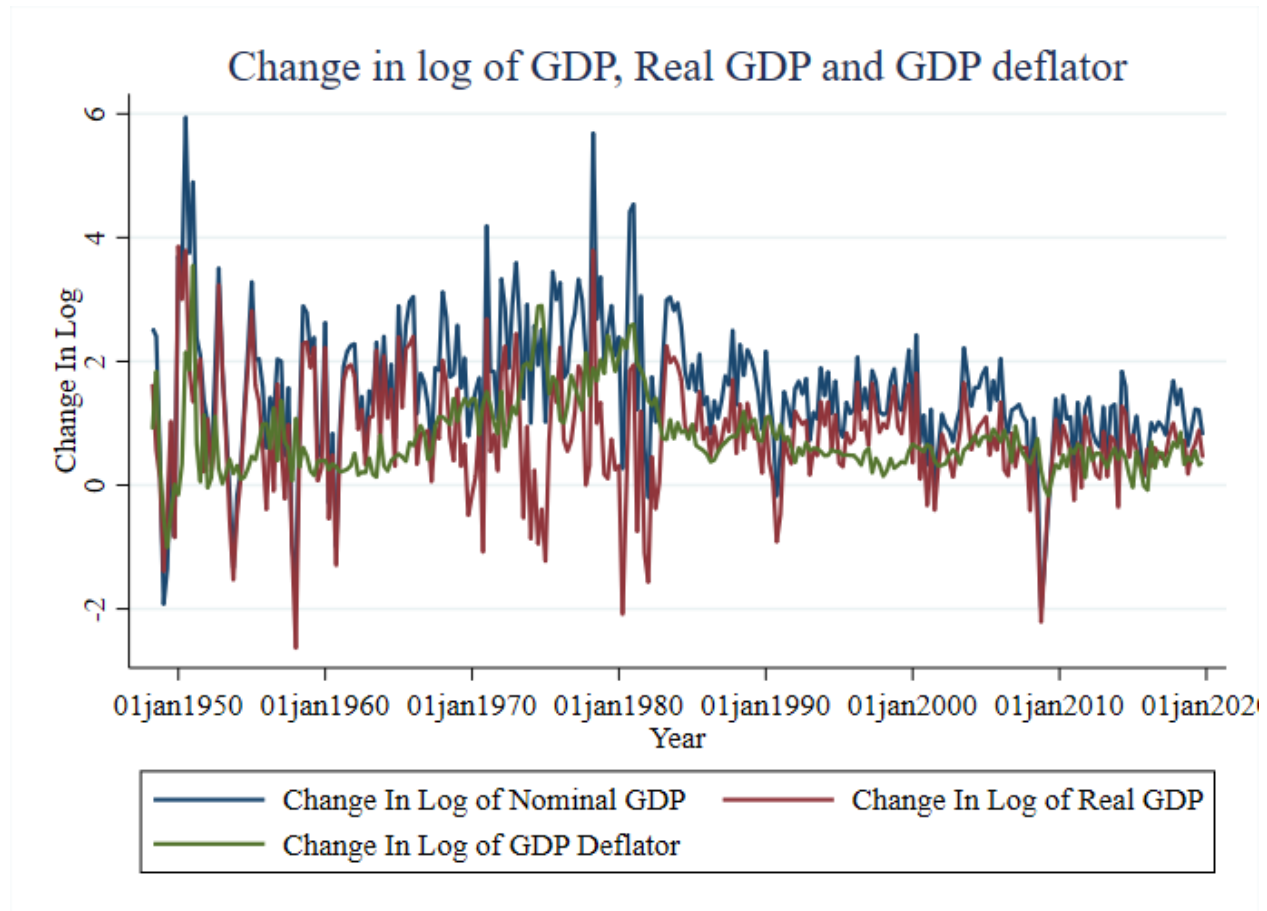
### Part 2.1



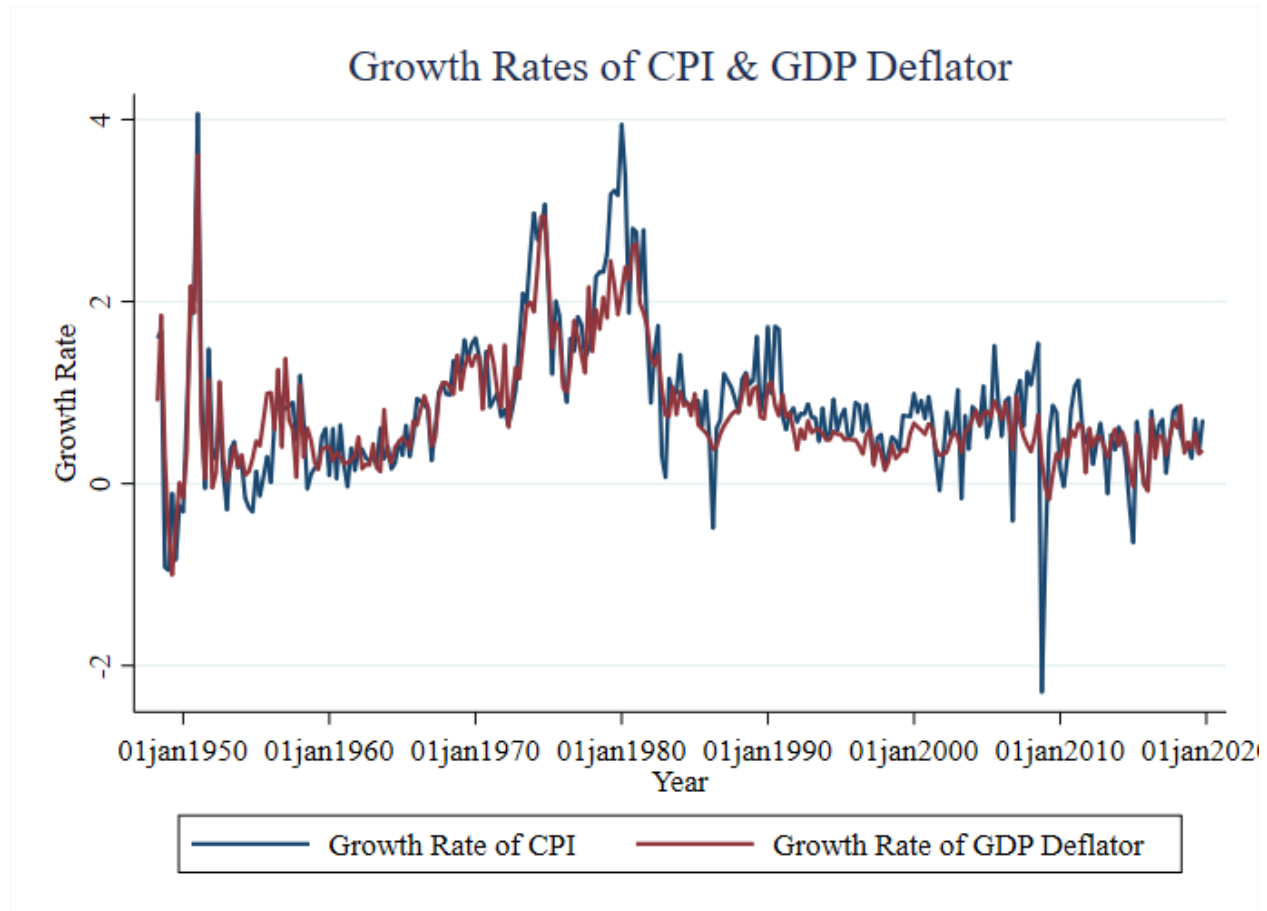
It is approximately true that  $gr(Y^n) = gr(Y^r) + gr(P)$ , as evidenced by the graph below:



## Part 2.2



### Part 2.3



To calculate the correlation coefficient:

#### **Matrix of correlations**

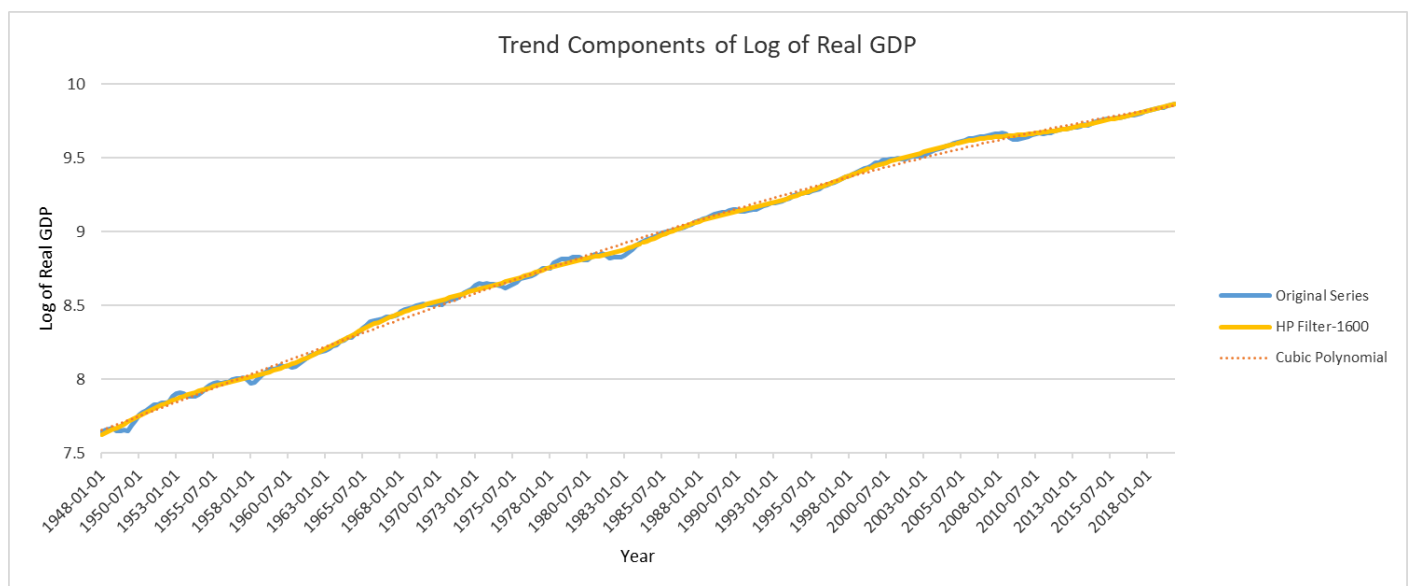
Variables	(1)	(2)
(1) CPI Growth Rate	1.000	
(2) GDP Deflator Growth Rate	0.864	1.000

Therefore, the correlation coefficient between the growth rate of CPI and the growth rate of the GDP deflator is 0.864.

The years where there are large deviations between the two series all share the common feature of being around years of significant economic crisis in the United States; the 1950s, 1980s and 2008. This may impact the way the measurements are constructed, such as the value of the basket of goods used for the calculation of CPI creating a large deviation from the calculation of the GDP Deflator.

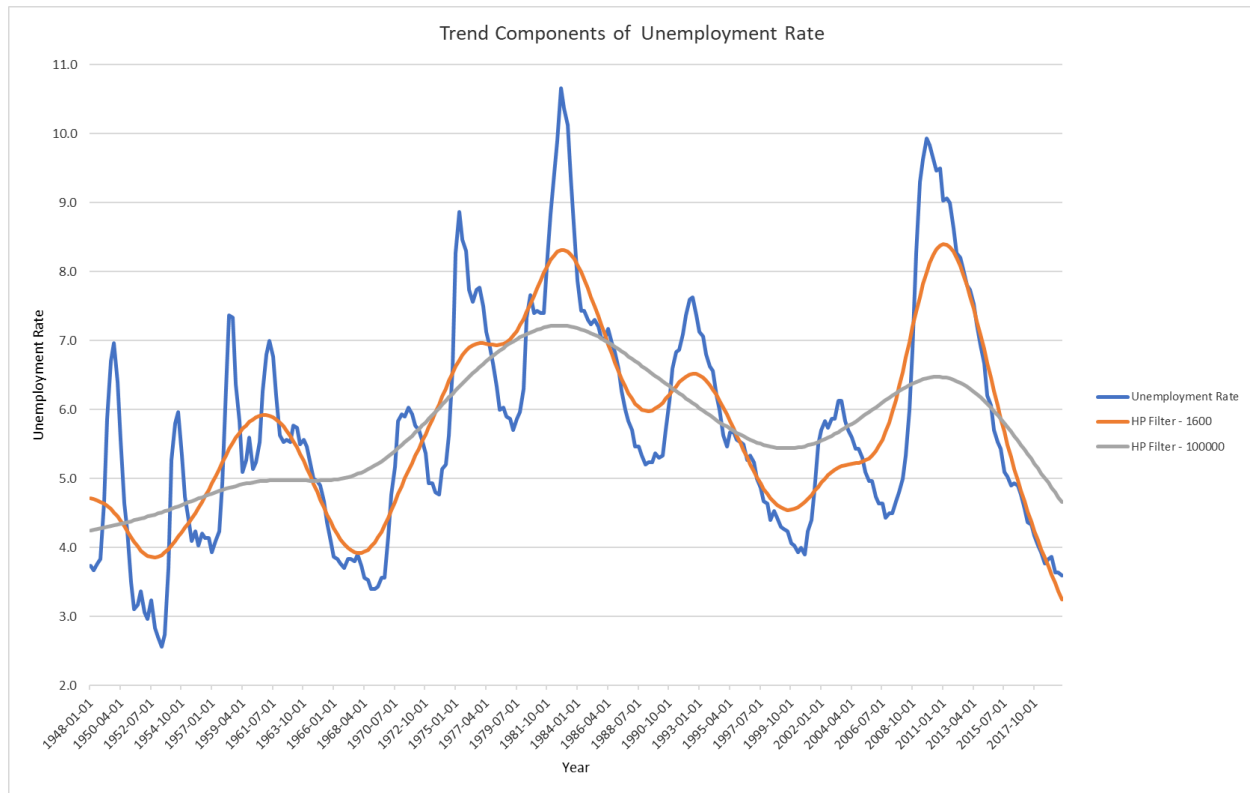
### **Question 3**

#### **Part 3.1**



The cubic polynomial appears to be smoother than the filter.

### Part 3.2



### Part 3.3

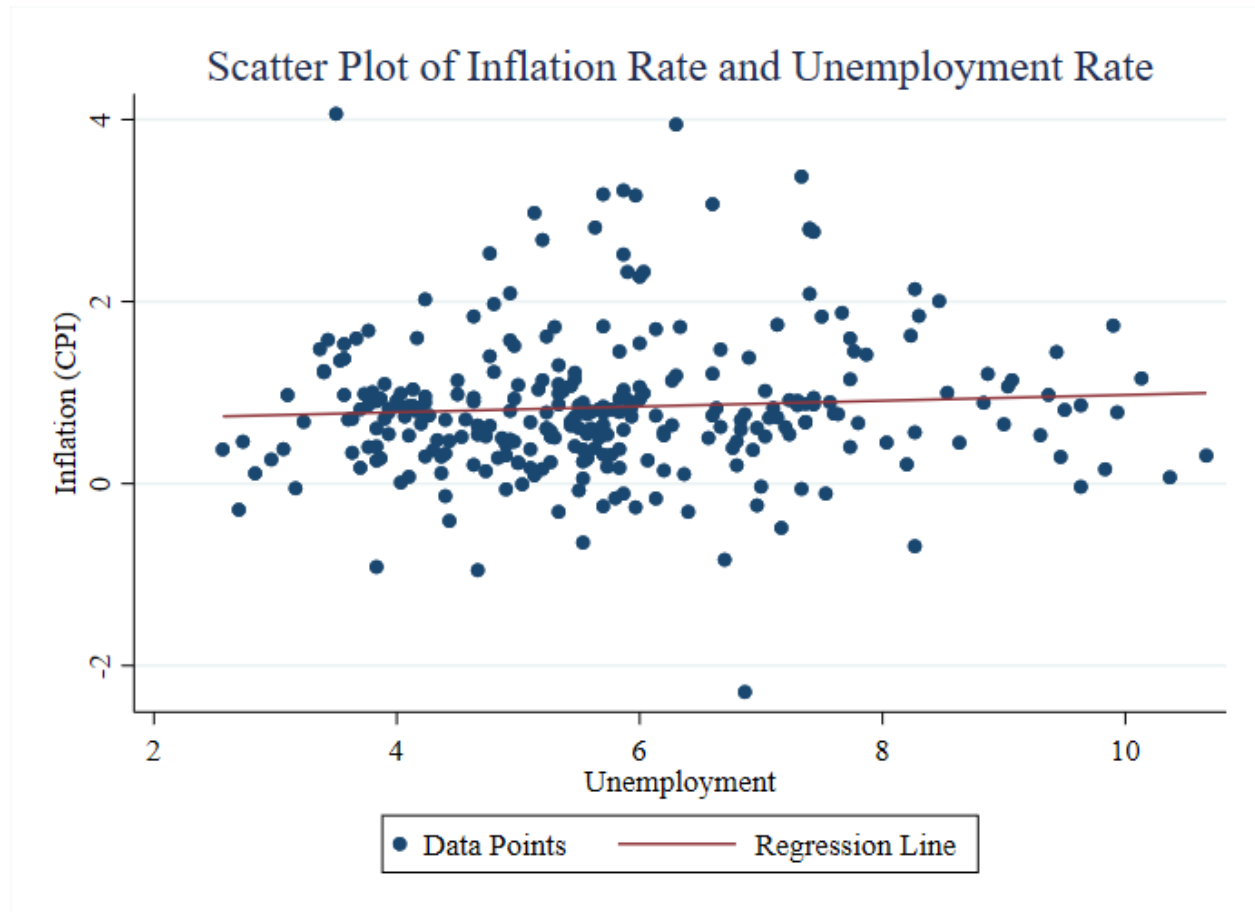
To compute the correlation coefficient for detrended real GDP and detrended Unemployment Rate, we take the difference between the trend series of GDP and log of real GDP, and the same for Unemployment Rate, and calculate the coefficient between the two, which returns a result of -0.724.

This result is somewhat expected as there should be a negative correlation/relationship between GDP and Unemployment Rate, as output is determined by the quantity of labor utilized. Therefore when unemployment falls, output will rise and vice versa.



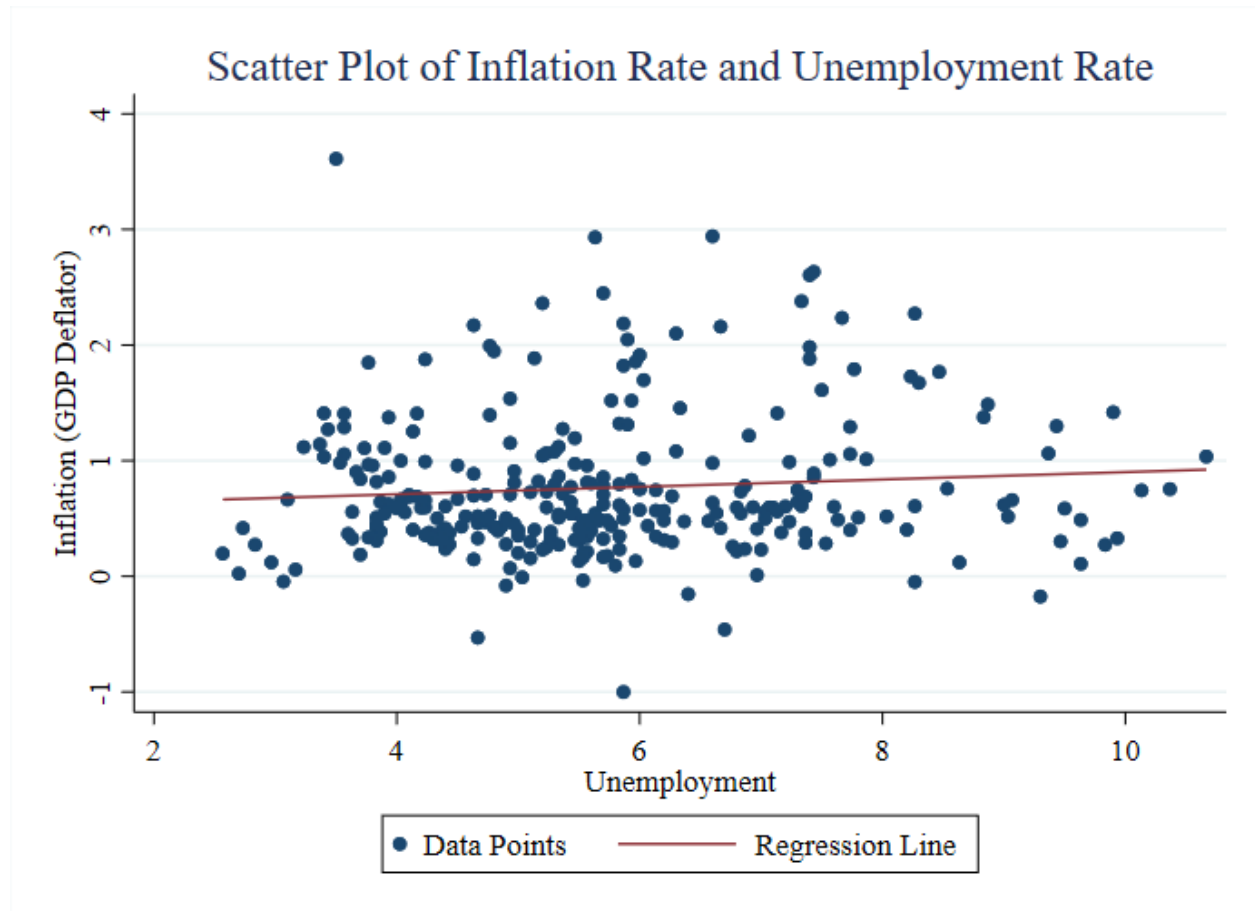
## **Question 4**

### **Part 4.1**



There is no clear Phillips Curve that can be identified in this graph

## Part 4.2



The Phillips curve again cannot be clearly identified in this graph.

### Part 4.3

Figure 8-2:

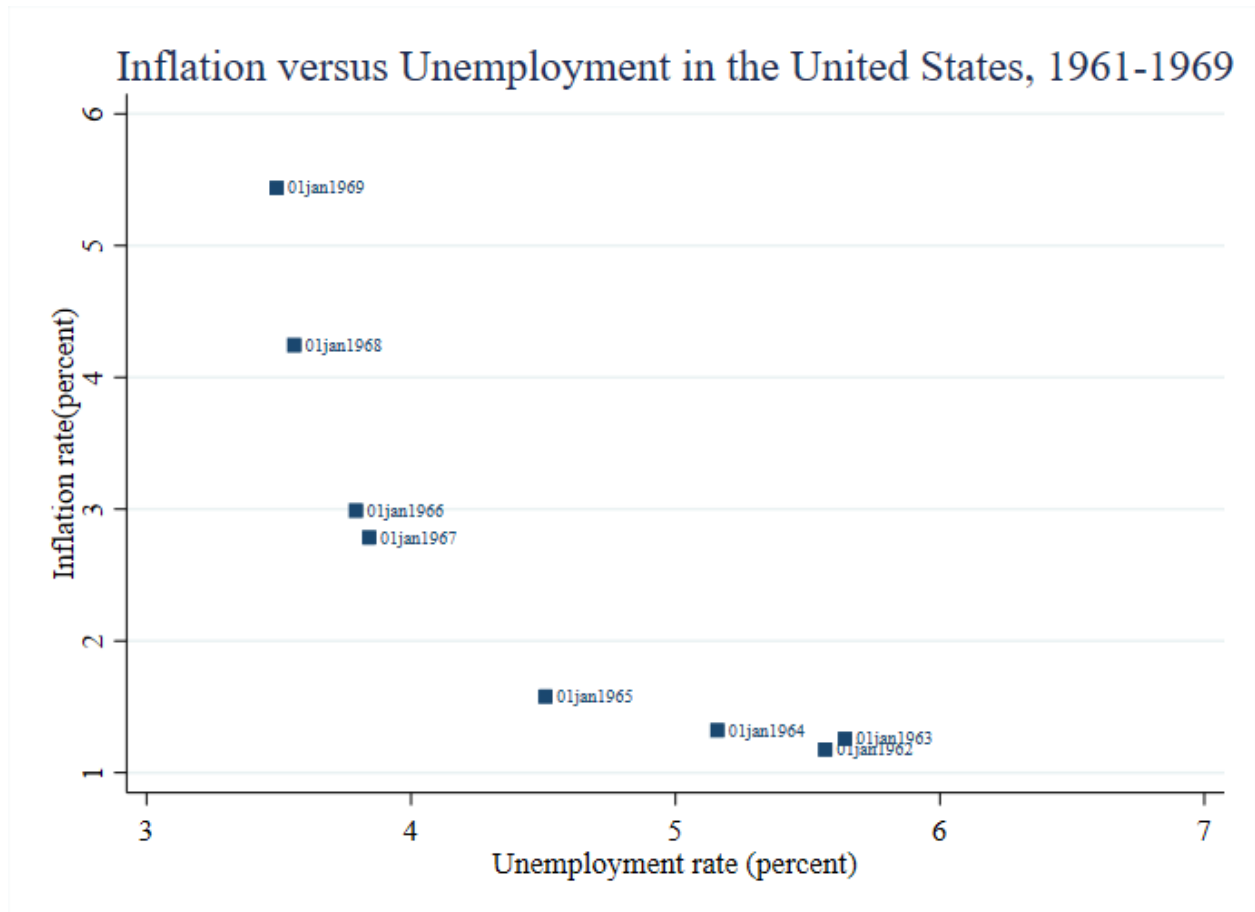


Figure 8-3:

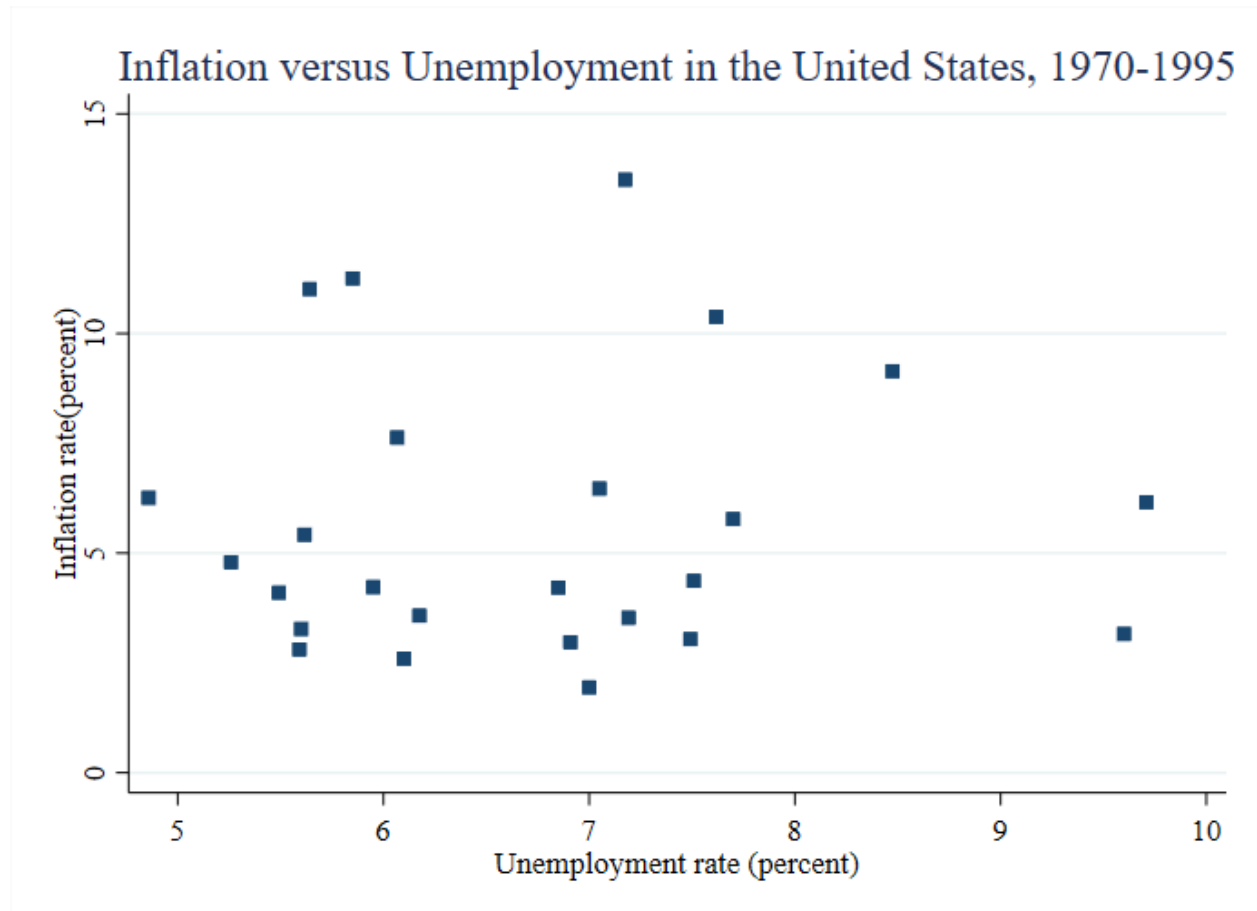
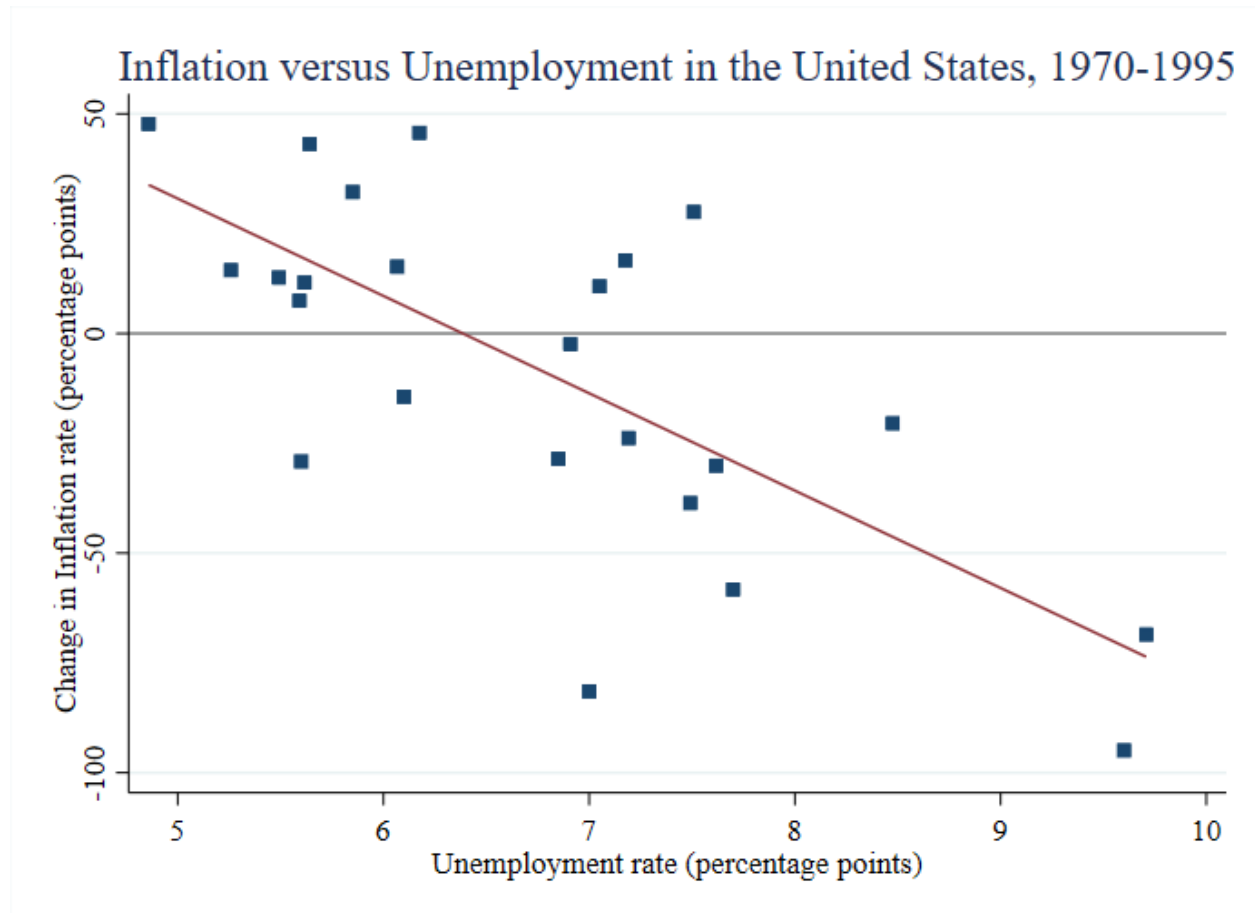


Figure 8-4:



$$\text{Regression Line} = \pi_t - \pi_{t-1} = 7.4\% - 1.2u_t$$

Source: FRED: CPIAUCSL, UNRATE, GDP, GDPC1, LNS12300060