

## Problem Set #1

**DUE: Beginning of Class 2/13 or 2/14 depending on the section**

**You may work in a group of up to 3 people. Whatever you hand in should be the work of your group. Your report should take the form of a professional piece of work. You should be prepared to discuss your findings in front of class.**

1. One big question is “how is economic growth distributed?” This first question looks at labor’s share of income, that is how much do workers get out of the total pie?
  - a. Using FRED, acquire the following data series: Gross Domestic Product (FRED Code “GDP”) and Compensation of employees (FRED Code “W209RC1Q027SBEA”) (Note, I will call this Labor Compensation). For convenience, work only with annual frequencies.

Construct a similar table as that displayed below, by computing the growth rates by decade of GDP and Labor Compensation.

	1970–1980	1980–1990	1990–2000	2000–2018	1970–2018
Growth Rate of GDP					
Growth Rate of Labor Compensation					

- b. Construct a graph that plots the **ratio** of Labor Compensation relative to GDP for the entire time period.
- c. Be prepared to discuss several features of this data in class.
  - In class we argued that that the wages should grow at a similar rate as GDP. (**Do you remember why?**) Is the data consistent with this idea?
  - We also argued that all labor earnings relative to GDP should be a constant fraction,  $1 - \alpha$ . (Again, do you remember why?) Is the data consistent with this idea?
  - There are broad concerns about changes in the nature of income inequality. Do your findings speak to this?

Background reading:

- [Conversableconomist on the basic facts and explanations.](#)

2. This question practices real vs. nominal concepts and also highlights another feature of the data we want to understand with respect to economic growth— returns on capital and how they relate to real interest rates.
- Using FRED, acquire the following data series: “Consumer Price Index for All Urban Consumers: All Items Less Food & Energy” (FRED Code “CPILFESL”) and “1-Year Treasury Constant Maturity Rate” (FRED Code “GS1”). **Note these come at different frequencies. We want everything to be at an annual frequency. Tips will be posted on the blog.**
  - Construct a similar table as that displayed below, by computing the growth rates of the CPI by location and over 10 year horizons.

	1970–1980	1980–1990	1990–2000	2000–2018
Growth Rate of Consumer Price Index				
1-Year Treasury Constant Maturity Rate				
Difference between Treasury Rate and Growth Rate of CPI				

- Construct a graph that plots the **difference** between the Treasury Rate and the Growth Rate of the CPI over the entire time period.
- Be prepared to discuss several features of this data in class.
  - What is the interpretation of the Growth Rate of the CPI? What is the interpretation of the difference between the Treasury Rate and the Growth Rate of the CPI?
  - How has the series difference between the Treasury Rate and the Growth Rate evolved over the past 50 years?
  - Does this have anything to do with “returns on capital”? Think about the opportunity cost of investing one dollar in capital  $K$ ? Well you could have invested in a treasury bill...so one dollar invested in capital should give a similar return to one dollar invested in a treasury bill...

Background reading:

- [From the CEA under Obama. If you read this, focus on the “Factors that Likely Are Longer-Lived” at the bottom of the page.](#)
- [Related commentary from John Cochrane.](#)