

## Problem Set #1

**DUE: Friday 2/9, 530pm**

**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.**

1. This question studies how labor income has evolved over the past 50 years relative to GDP.
  - 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	2000–2016	1970–2016
Growth Rate of GDP					
Growth Rate of Labor Compensation					

Are these data consistent with the idea from class (02/05) that the marginal product of labor should grow at a similar rate as output per worker? If at all, why or why not?

- b. Using FRED, download some additional data: Proprietors' income with inventory valuation and capital consumption adjustments: Nonfarm (FRED Code "A045RC1A027NBEA") and Proprietors' income with inventory valuation and capital consumption adjustments: Farm (FRED code "B042RC1A027NBEA" )

Assuming that Labor Compensation and these two measures of Proprietors Income account for the amount of income attributed to labor, construct a graph of "Labor's Share of Income" (that is labor income divided by GDP) showing the its evolution between 1970 and 2016.

In your report, please address several questions about this graph. . .

- Is there any connection between the findings in Part a and this graph?
- What does this graph imply about the amount of income attributed to capital?
- Do you think it is correct to attribute all of Proprietor's income as a payment to labor?
- Do these findings have any implications for income inequality?

2. This question studies how inflation has varied across time and space in the United States.
- Using FRED, acquire the following data series: Consumer Price Index for All Urban Consumers: All Items (FRED Code "CPIAUCSL"), Consumer Price Index for All Urban Consumers: All items in New York-Northern New Jersey-Long Island, NY-NJ-CT-PA (FRED Code "CUUSA101SA0"), Consumer Price Index for All Urban Consumers: All items in Detroit-Ann Arbor-Flint, MI (FRED Code "CUUSA208SA0").

With all these data series, focus on the data from 1984 and on, at an annual frequency.

- Graph the all three CPI's (the level, not the growth rate) on a well-labeled figure.

Construct a similar table as that displayed below, by computing the growth rates of the CPI by location and over 10 year horizons.

	1984–1995	1995–2005	2005–2016	1984–2016
Growth Rate of CPI: All Urban Consumers				
Growth Rate of CPI: NY Area				
Growth Rate of CPI: Detroit Area				

- Speculate as why the cost of living has grown differentially in the New York Metropolitan area relative to the Detroit Metropolitan area. Hint: In FRED you can find CPI's by location for housing. And in FRED you can find CPI's by location less shelter (i.e. not including housing or rent).
- Suppose that you are a twin. And you and your twin graduated from NYU in 1984. Your twin took a job in Detroit and has remained there. And her nominal salary increased with the rate of the CPI for All Urban Consumers. You took a job in Manhattan and your nominal salary increased with the rate of the CPI of All Urban Consumers.

Who is better off you or your twin? In a narrow sense? In a broad sense? Why or why not? Please provide an argument for and an argument against.