Problem Sets 4

1. Calculating inflation using a simple price index

Consider a fictional price index, the College Student Price Index (CSPI), based on a typical college student's annual purchase. Suppose the following table shows information on the market basket for the CSPI and the prices of each of the goods in 2017, 2018, and 2019. The cost of each item in the basket and the total cost of the basket are shown for 2017. Perform these same calculations for 2018 and 2019, and enter the results in the following table.

	Quantity in Basket	2017		2018		2019	
		Price (USD)	Cost (USD)	Price (USD)	Cost (USD)	Price (USD)	Cost (USD)
Notebooks	10	5	50	7		11	
Calculators	1	100	100	110		140	
Large coffees	150	1	150	1		1	
Energy drinks	50	2	100	3		4	
Textbooks	10	100	1,000	120		150	
Total cost			1,400				
Price index			100				

Suppose the base year for this price index is 2017.

In the last row of the table, calculate and enter the value of the CSPI for the remaining years.

Between 2017 and 2018, the CSPI increased by how many percent?

Between 2018 and 2019, the CSPI increased by how many percent?

Which of the following, if true, would illustrate why price indexes such as the CSPI might overstate inflation in the cost of going to college?

1) The quality and design of calculators improved dramatically from 2017 to 2019. For example, calculators made in 2019 accept memory cards, whereas those made in 2017 do not, but this quality change is hard to measure.

2) A new, safe method of memory enhancement became available for purchase.

3) Professors required each student to buy 10 notebooks, regardless of the price.

4) As the price of textbooks increased, more and more students turned to the used-book market or chose not to buy textbooks at all, instead using the copies on reserve in the library.

2. Comparing salaries from different times

Consider golfers who led the Professional Golfers' Association of America (PGA) in winnings at different points in time. Note that the winnings are nominal figures (unadjusted for inflation). To convert the original earnings of Nicklaus, Trevino, and Stadler, use the formula for converting dollar figures from an earlier era into year 2017 U.S. dollars. Using those figures, fill in the following table, making sure to round your responses to the nearest U.S. dollar.

Year	Golfer	Nominal Winnings (Dollars)	U.S. CPI (1983 = 100)	Winnings in 2017 Dollars
1965	Jack Nicklaus	140,752	31.5	
1970	Lee Trevino	157,037	38.8	
1982	Craig Stadler	446,462	96.5	
2017	Justin Thomas	9,921,560	245.1	9,921,560

According to the previous table, is the golfer with the highest PGA winnings in nominal dollars the same as the golfer with the highest PGA winnings after adjusting for inflation?

3. Interest, inflation, and purchasing power

Suppose Neha is an avid reader and buys only mystery novels. Neha deposits $3,000 in a bank account that pays an annual nominal interest rate of 5%. Assume this interest rate is fixed—that is, it won't change over time.

1) At the time of her deposit, a mystery novel is priced at $10. Initially, what is the purchasing power of Neha's $3,000 deposit for mystery novels?
2) For each of the annual inflation rates given: 0%, 5%, 8%, first determine the new price of a mystery novel, assuming it rises at the rate of inflation. Then calculate the corresponding purchasing power of Neha's deposit after one year for each inflation rate. Finally, calculate the value for the real interest rate at each of the given inflation rates. [Hint: Round your answers to the nearest mystery novel. For example, if you find that the deposit will cover 20.7 mystery novels, you would round the purchasing power down to 20 mystery novels under the assumption that Neha will not buy seven-tenths of a mystery novel.]
3) When the rate of inflation is equal to the interest rate on Neha's deposit, what is the purchasing power of her deposit over the course of the year?