ECO 120-04
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Wednesday 2 November 2022   Your full name: _____

Assignment 8: Economic measurement

Due Monday 7 November. Please submit hardcopy at the beginning of class (11:00 a.m.), or if you prefer, under the door of Wimberly Hall 339C by 10:50 a.m.

Please ensure that all of your responses include appropriate units.

Part A: Aggregate accounting

Suppose Wisconsin has a two-good economy with the following historical data for 2019 and 2020:

Good	Wisconsin, 2019		Wisconsin, 2020	
	Price ($/pound)	Output (billion pounds)	Price ($/pound)	Output (billion pounds)
Cow beverage	1.50	10	1.00	20
Soy beverage	2.00	25	3.00	20

1. What was the nominal GDP of the Wisconsin two-good economy in 2019?

2. What was the nominal GDP of the Wisconsin two-good economy in 2020?

3. What was the percent change in nominal GDP from 2019 to 2020?

4. For the following questions, please use 2019 as the base year.

    a) What was the real GDP of the Wisconsin two-good economy in 2019?

    b) What was the real GDP of the Wisconsin two-good economy in 2020?

    c) What was the percent change in real GDP from 2019 to 2020?

    d) Using your calculation of nominal GDP above and your calculation of real GDP (with a 2019 base year), how much of the percentage change in nominal GDP is due to inflation?

5. For the following questions, please use 2020 as the base year.

    a) What was real GDP of the Wisconsin two-good economy in 2019?

    b) What was real GDP of the Wisconsin two-good economy in 2020?

c) What was the percent change in real GDP from 2019 to 2020?

d) Using your calculation of nominal GDP above and your calculation of real GDP (with a 2020 base year), how much of the percentage change in nominal GDP is due to inflation?

6. For the following questions, please use 2019 as the base year.

a) Calculate a consumer price index for 2019.

b) Calculate a consumer price index for 2020.

c) Calculate the percentage change in your index from 2019 to 2020.

d) Please interpret your last result with a sentence.

7. For the following questions, please use 2020 as the base year.

    a) Calculate a consumer price index for 2019.

    b) Calculate a consumer price index for 2020.

    c) Calculate the percentage change in your index from 2019 to 2020.

    d) Please interpret your last result with a sentence.

Part B: The La Crosse-Onalaska, WI-MN metropolitan statistical area

Consider these actual labor force data from the Bureau of Labor Statistics:

Labor force data for the La Crosse-Onalaska, WI-MN MSA					
	Number of persons, in thousands				
	Oct. 2021	Nov. 2021	Dec. 2021	Jan. 2022	Feb. 2022
Civilian Labor Force	78.2	78.6	78.3	77.5	78.6
Employment	76.6	77.1	76.8	75.4	76.5
Unemployment	1.6	1.5	1.4	2.1	2.2

Unfortunately the BLS does not provide data on the labor force participation rate for MSAs. So let's try to estimate one ourselves using national data.

In the US during Nov 2021, the working-age population was 205,225,809; the total population was 332,598,000. The population of the La Crosse MSA was 139,211. Assume that the La Crosse MSA has the same age distribution as the entire US.

1. Calculate an estimate of the working-age population for the La Crosse MSA. Assume that this population was constant across all the months listed above.

2. Consider the fall quarter of 2021 (Q4) by comparing Oct. 2021 and Jan. 2022.

   a) What was the labor participation rate in Oct. 2021?

   b) What was the unemployment rate in Oct. 2021?

   c) What was the labor participation rate in Jan. 2022?

   d) What was the unemployment rate in Jan. 2022?

   e) What was the change in labor participation rate during 2021 Q4?

   f) What was the change in the unemployment rate during 2021 Q4?

g) By how many people did the labor force change over this period?

h) By how many people did unemployment change over this period?

3. Suppose that those people who left the labor force over the course of 2021 Q4 had been unemployed and gave up on their job search. What if they had instead continued their job search? In this part, consider a scenario in which these people kept searching for a job. That is, count the people from question 2g as being unemployed (and thus also part of the labor force) in Jan. 2022.

a) How many unemployed people would have been counted for Jan. 2022?

b) The labor force in Jan. 2022 would have totaled what value?

c) What would the labor participation rate have been for Jan. 2022?

d) What would the unemployment rate have been for Jan. 2022?

e) What would the change in labor participation rate have been for 2021 Q4?

f) What would the change in the unemployment rate have been for 2021 Q4?