

Homework #3

Professor: Alex Houtz
Due: September 28, 2026

Problem 1 (Macroeconomics).

For each statement below, determine whether the topic is more appropriately classified under microeconomics or under macroeconomics.

Topic of Study	Micro	Macro	Topic of Study	Micro	Macro
Why a country's currency depreciated	☐	☐	How a drought changes the price of coffee	☐	☐
Why a movie theater charges less for matinees	☐	☐	How Federal Reserve rate cuts affect inflation	☐	☐
Why the national unemployment rate increased	☐	☐	Why real GDP declined during a recession	☐	☐
How rent control affects available apartments	☐	☐	How a monopoly chooses its price and output	☐	☐
How federal stimulus spending affects GDP	☐	☐	How a cigarette tax changes consumer purchases	☐	☐
How pollution regulations affect a factory	☐	☐	Why the overall price level rose by 4 percent	☐	☐
How an economy's productivity affects growth	☐	☐	How a minimum wage affects a restaurant's hiring	☐	☐

Problem 2 (GDP and Expenditure).

Recall our expenditure equation for GDP:

$$Y = C + I + G + (x - i)$$

- (a) Label each part of the expenditure equation. Provide a brief description of each part.
- (b) Suppose that consumption is \$35, investment is \$20, government spending is \$10, and net exports are \$0. What is Y ?
- (c) Suppose that investment is \$20, government spending is \$5, net exports are -\$3 and GDP is \$200. What is consumption?
- (d) Suppose that consumption is \$205, investment is \$45, government spending is \$12, exports are \$30, and Y is \$240. What are imports?

Problem 3 (GDP and Prices and Quantities).

A little known fact about Luke Skywalker is that while he still worked on his uncle's farm, he devoted himself to national accounting. He gathered the data in table 1 on trades the Jawa made near his home.

	Year 1	Year 2	Year 3
<i>Quantities</i>			
Astromech droids	60	400	350
Moisture vaporators	90	10	60
Power converters	15	10	20
<i>Prices (truguts)</i>			
Astromech droids	150	155	160
Moisture vaporators	25.0	25.5	26.5
Power converters	7.50	7.70	8.00

Table 1: Prices and Quantities on Tatooine

- Compute nominal GDP in each year
- Compute real GDP using year 1 prices, then compute real GDP growth (from year 1 to year 2 and from year 2 to year 3)
- Compute real GDP using year 2 prices then compute real GDP growth
- Compute real GDP using year 3 prices then compute real GDP growth
- Use the BEA formula to compute real GDP growth

Problem 4.

While on Dagobah, with his X-Wing stuck in the swamp, Luke Skywalker asks the local swamp creatures about their consumption habits. After asking Yoda, who, like the Jedi Master he is, knows the prices for those goods for the last few years off the top of his head, Luke records the prices in table 2.

	Year 1	Year 2	Year 3
<i>Prices (Imperial credits)</i>			
Dagobah ration packs	8	9	11
Glow rods	14	16	18
Jedi training remotes	40	44	50

Table 2: Prices in the Dagobah Consumption Basket

- Suppose that the average swamp creature consumes 12 ration packs, 1 glow rod, and 5 training remotes. Choose a base year. What is CPI each year?
- What is inflation in years 2 and 3?

(c) Does changing the base year change inflation? Support your answer.

Problem 5 (GDP and Value Added).

Luke Skywalker, in retirement on the world Ahch-To after his failed schooling experiment, returns to his national accounting roots and collects the data in table 3 on businesses around his island.

	Thala-Siren Dairy	Caretaker Creamery	Luke's Cliffside Café
Value of sales	3,200	7,800	12,600
Thala-siren milk	0	3,200	0
Green-milk cheese	0	0	7,800
Corellian grain (im-ported)	0	0	1,000
Wages	1,800	2,400	2,200
Interest payments	150	300	300
Rent	450	700	600
Profits	800	1,200	700

Table 3: Production on the Island of Ahch-To

Calculate GDP using the value-added approach. Confirm with the income and expenditure approaches.

Problem 6 (Costs of Inflation).

Consider the following quote from [an article](#) in the Wall Street Journal:

A \$16 bacon cheeseburger may not be enough to save your neighborhood bar and grill.

Independent restaurants are on financial life support, owners say, squeezed between escalating payroll costs and diners' dwindling tolerance for ever-higher checks. Wages for waitstaff, table bussers and line cooks will grow more expensive for many eateries this year, with 22 states in January raising the minimum wage for hourly workers.

The industry's economic strains can be seen on the appetizer plate at Chef Zorba's Restaurant in Denver. Owner Karen LuKanic recently swapped Greek giant beans for homemade stuffed grape leaves to save money, and switched to cheaper shoestring potatoes from thick-cut fries. Denver has increased its minimum wage annually since 2020, most recently in January to \$18.29 an hour, while Colorado has expanded paid sick leave and other employee benefit requirements.

"We are just keeping our head above water," said LuKanic, who estimated about half her restaurant's sales now go to payroll and other employee-related costs.

Chef Zorba's charges \$15.75 for a bacon cheeseburger, \$5 more than in 2018. Even at those prices the 78-seat restaurant can't turn a profit. LuKanic said she would consider closing if her Small Business Administration loan wasn't guaranteed by her house.

Refer to the class slides on the costs of inflation. Identify the single cost of inflation illustrated by this excerpt and explain how the excerpt illustrates it.

Problem 7 (Exploring Money Supply and Velocity).

FRED is an economic-data website maintained by the Federal Reserve Bank of St. Louis. You do not need to create an account or download any data for this problem.

Recall the equation of exchange:

$$MV = PY$$

- (a) Briefly describe what each variable of the equation of exchange represents.
- (b) Navigate to [FRED](#). Find the search bar in the middle of the page. Type **M2SL** into the search bar and select **M2**. M2 will serve as our measure of the nominal money supply.
 - Look above the chart. What are the units? What is the frequency?
 - Click on “Edit Graph” in the upper right. Modify the frequency to “Quarterly.” For the aggregation method, select “Average.” Exit out of this edit tab.
 - Change the beginning date of the graph to January 1, 2015.
 - What happened to M2 during the first half of 2020? Describe the movement in the data.
 - If you only knew what happened to M2, what would you predict happened to prices holding V and Y constant?
- (c) Return to the FRED search page, type **GDPDEF** into the search bar and select **Gross Domestic Product: Implicit Price Deflator**.
 - What units is the GDP deflator in? What frequency?
 - Change the beginning date of the graph to January 1, 2015.
 - What happened to the deflator during the first half of 2020?
 - How does that relate to your answer in (b)? What does that imply about either velocity or GDP in the equation of exchange?
- (d) Return to the FRED search page. Type **M2V** into the search bar and select **Velocity of M2 Money Stock**.
 - What units are velocity in? Look below the graph for an explanation of the units.
 - Change the beginning date of the graph to January 1, 2015.
 - What happened to velocity during the first half of 2020?
 - Does this match your expectation from parts (b) and (c)?
- (e) Return to the FRED search page. Type **GDPC1** into the search bar and select **Real Gross Domestic Product**.
 - What units is RGDP in? Which frequency?
 - Change the beginning date of the graph to January 1, 2015.
 - What happened to RGDP during the first half of 2020?