

Write your name on the cover of the test booklet and nowhere else. Enclose this sheet with the booklet. The Excel file will be handed in via Canvas. Your name will only appear on a page of the file that has nothing else on it. Failure to follow these directions will cost you 1 point. The test has 100 points (to be scaled up to 170 points) and is scheduled to take 50 minutes (but you can take the full 2 hours.) Therefore, expect to spend 1 minute for every 2 points. For example, a 10-point question should take 5 minutes.

The first table is from Table 3, “Proportion of Occurrences in Which Trends of Various DURATIONS Involve Cyclical Reversals of Business Activities.” The first columns are for “Decreasing Trends During Cyclical Expansions - Months” and that later columns are for “Increasing Trends During Cyclical Contractions - Months”. It is for initial claims for unemployment insurance.

1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
.21	.25	.29	.36	.41	.45	.45	.53	.39	.53	.53	.64	.75	.82	.90	.90

The next table is from Table 4, “Proportion of Occurrences in Which Trends of Various MAGNITUDES Involve Cyclical Reversals of Business Activities.” The first columns are for “Decreasing Trends During Cyclical Expansions - Percent Decrease Larger Than” and that later columns are for “Increasing Trends During Cyclical Contractions - Percent Increase Larger Than”. It is for initial claims for unemployment.

0.0	0.3	0.5	1.0	3.0	5.0	10	20	0.0	0.3	0.5	1.0	3.0	5.0	10	20
.21	.21	.23	.25	.36	.45	.64	.82	.39	.43	.43	.47	.56	.75	.90	1.0

1) (8 points) For EITHER the event in Part A OR the event in Part B, determine the probability that the economy is changing direction. Briefly tell me how you figured out which table to use, which half of it to use, and which column to use. Also tell me if the probability you gave me is for entering a recession or a boom.

- A) The initial claims for unemployment insurance increases .4% during a boom.
- B) The initial claims for unemployment insurance decreases for 4 months during a recession.

2) (8 points) Answer EITHER Part A OR Part B. This question is actually easier than it appears.

- A) How could you use Table 3 to determine if a variable is good for conformity? Explain your logic.
- B) How could you use Table 4 to determine if a variable is good for smoothness? Explain your logic.

3) (12 points) For EITHER *change in labor costs per unit of output* OR *new orders of consumer goods*, is it procyclical, acyclical, or counter-cyclical? Explain your logic. Is it leading, lagging, or roughly coincident? Explain your logic.

4) (12 points) For EITHER *currency* OR *timing*, explain what that term means and why we want a variable to have that quality.

5) (10 points) Answer EITHER Part A OR Part B.

- A) Normally, two consecutive quarters of falling GDP indicates a recession. However, GDP fell for both of the first two quarters last year. Why didn't they classify that as a recession?

B) Business cycles are *recurrent but not periodic*. What does that mean?

6) Use the following equations to answer this question. $C_t = 600 + 0.9(\text{average}(Y_t, Y_{t-1}, Y_{t-2}) - T_t)$.

$$T_t = \frac{1}{3}Y_t$$

$$I_t = .3(Y_t - Y_{t-1})$$

$$G_t = 900$$

$$NX_t = 300 - 0.05Y_t$$

A) (12 points) Solve the equations for Y_t as a function of exogenous variables and lagged variables.

Keep coefficients as fractions rather than decimals. Show all work.

B) (10 points) Put the equations from Part A into a spreadsheet. Use it to predict GDP for 30 periods if the GDP for the last two periods was \$3500 and \$3600 in that order. Make sure you format the numbers correctly. Use the spreadsheet to determine what would happen if the government spending went up \$100 permanently. Find both the long-run (30 periods) and short-run government spending multipliers for a permanent change in G .

C) (12 points) Have the computer plot both of the GDPs in Part B on the same graph. Make sure the graph is fully labeled. Is that pattern monotonic convergence, monotonic divergence, oscillating convergence, or oscillating divergence? Explain your logic.

7) (16 points) Answer EITHER Part A OR Part B.

A) Draw the LRAS/SRAS/AD diagram. Illustrate the effects of an improved infrastructure. Assume the improvement in the infrastructure was done and paid for last year. Show the effects that will occur this year. Explain why the curve(s) moved as drawn. What happens to unemployment, GDP, and inflation.

B) Draw the LRAS/SRAS/AD diagram. President Biden passed the "Inflation Reduction Act". It was mostly investment in infrastructure. Illustrate the short-run effects on the graph. Explain why the curve(s) moved as drawn. Does that reduce inflation?