

## ECO 305: Intermediate Macroeconomics

### Week 8 Homework: Dynamic Model of Consumer and Producer Decisions

Write your answers in the space provided or on your own paper. When you have finished, scan or take pictures of your work, combine all images to a single PDF file, assure that all pictures are oriented right-side up, and upload your work as a single PDF file to the Canvas Assignment area.

**Note:** For all the problems that follow, assume when appropriate that substitution effects dominate income effects.

**Hints:** That implies that the effect of a change in slope of a budget line (when it happens) will dominate the effect of the new budget line being inward or outward from the original budget line. Focus on the budget line being steeper or flatter, then move in the direction of the steeper (left) or flatter (right) part of the indifference curve. Remember too, that when there are parallel shifts in the budget line, the slope does not change, and there is only an income effect.

1. Suppose the government announces that they will increase taxes in the future. Describe and illustrate the impact on the optimal decisions for consumption, leisure, future consumption, and saving.

Hints: Use two of the frameworks. Use the consumption/leisure model to illustrate the impact on leisure and consumption, recognizing that the lifetime net present value of taxes can shift the budget constraint. Use the consumption/savings model to illustrate the impact on current and future consumption.

2. Suppose there is a decrease in interest rates. Describe and illustrate the impact on the optimal decisions for consumption, leisure, future consumption, and saving.

Hints: Use two of the frameworks. To make a prediction for leisure, make sure one of the frameworks includes leisure. To make a prediction for the impact of interest rates, make sure both frameworks involve a present period variable and a future period variable.

3. Suppose there is an increase in current wages. Describe and illustrate the impact on the optimal decisions for consumption, leisure, future consumption, and saving.

Hints: Use the consumption/leisure framework to illustrate the impact of the change in wages on current consumption and leisure, and use the consumption/savings framework to illustrate the impact on current and future consumption. Note that the wage affects lifetime net present value of income in the consumption/savings framework.

4. Suppose technology firms announce a new artificial intelligence technology that will be soon available and promises to make businesses more productive. What happens to the marginal product of capital? Describe how this shifts the investment demand function.

5. Suppose a hurricane results in large destruction of capital for a regional economy. What happens to the marginal product of labor and the marginal product of capital? Describe how this shifts the investment demand function and the labor demand function.