SIMON FRASER UNIVERSITY
Department of Economics

Econ 305 — Prof. Kasa
Intermediate Macroeconomic Theory — Spring 2021

PROBLEM SET 1
(Due February 5)

1. (25 points). Suppose household preferences are described by the utility function

$$U(C, \ell) = \alpha C - \frac{1}{2}(\beta - \ell)^2$$

where C stands for consumption of market goods and ℓ stands for leisure. For simplicity, assume there is no government in this economy.

   (a) Assuming the market (real) wage is w and the total amount of time available is h, derive expressions for the household's consumption and labor supply decisions as a function of w and h. (For simplicity, assume the household has no nonmarket income). Does the income effect ever dominate the substitution effect? How does labor supply depend on income and consumption? Explain intuitively.

   (b) Now suppose output, Y, is produced by competitive firms with technology $Y = zN$ where N denotes labor inputs, and z is an index of productivity. Derive an expression of the firm's labor demand, and illustrate it with a graph.

   (c) Using your answers to parts (a) and (b), derive an expression for the market-clearing wage rate. How does the equilibrium wage change when z increases? How does the equilibrium wage change when α increases? Use a Labor Supply/Labor Demand graph to illustrate these changes.

2. (25 points). Suppose that government spending makes private firms more productive, e.g., spending on roads and bridges might reduce transport costs.

   (a) Using the production possibilities graph described in chpt. 5 of the text and in Lecture 5, show how an increase productive government spending could increase household welfare.

   (b) Show that the equilibrium effects on consumption and hours worked are ambiguous, but but that output definitely increases. Hint: Consider the induced income and substitution effects.