**Aalto University Intermediate Macroeconomics**

**Final Exam**

1. Suppose an economy’s consumers, investors, foreigners, and government can be described by:

C = 300 + .9(Y – T) I = 220 – 10r G = 300 T = 300 NX = 100

a. What is the equation for this economy’s IS curve? (8)

b. In the formulation above, taxes are allocated on a “lump-sum” basis. That is, regardless of an economy’s income, taxes are always a given number (like 300). Yet in many countries, taxes are income based rather than lump-sum based (for instance, in the U.S. we pay a fraction of our income rather than a lump sum in taxes). Let’s imagine that for every Euro earned, consumers pay a fraction of their income τ in taxes where 0<τ<1. In other words, the consumption function is now C = 300 + .9(1 - τ)Y rather than C = 300 + .9(Y – T) and T is now zero. How does the IS curve’s slope differ under a lump sum tax versus an income tax? (8)

c. How does the aggregate demand curve differ under a lump sum tax versus an income tax? (8)

2. Imagine that the economy was in short- and long-run economic equilibrium prior to a dramatic increase in the money supply. Assume further that workers cannot immediately differentiate between nominal and real wage increases. On the graphs below, sketch the short-run and long-run effects of an increase in the money supply. **Use a solid line for these sketches.** Be sure to include the time period before the money supply increase and the time immediately after the economy reached the final steady state. The vertical dashed lines indicate where the previous period ended and the next one begins. (30)

Time

Time

Time

Nominal

Interest Rate

Real

GDP

Price

Level

Real

Interest Rate

Increase in Ms

Short

Run

Concludes

Long

Run

Concludes

Unemp.

Rate

Time

Time

b. In part a, what determines the length of time the short-run lasts? (8)

c. Imagine that workers anticipated the increase in the money supply prior to when it actually happened. **Using a dashed line**, add to the sketches (on the previous page) and show how each variable evolves when workers anticipate the increase in the money supply. (15)

d. For this problem, ignore the situation described in part c. Some economists have argued that periods of economic expansion or recession cause changes to long-run aggregate supply. For instance, during periods of expansion individuals who usually are excluded from the labor market find jobs with greater ease and, while on these jobs, develop labor skills that permanently increase their marginal product of labor. Likewise, during recessions workers lose skills that result in a permanently lower MPL. **Using a dotted line**, show in the graphs of the previous page, how this “hysteresis” alters the evolution of the involved variables. (15)

I’m providing an extra graph in case you want to practice answering parts a, c and d in problem #2.

Time

Time

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