SIMON FRASER UNIVERSITY
Department of Economics

Econ 305   Prof. Kasa
Intermediate Macroeconomic Theory   Fall 2008

MIDTERM EXAM (Solutions)

Answer the following questions True, False, or Uncertain. Briefly explain your answers. No
credit without explanation. (8 points each).

1. Tax cuts decrease national saving.

   UNCERTAIN. This statements is false if Ricardian Equivalence holds. National saving
   is the sum of government saving, $(T-G)$, and private saving, $(Y-T-C)$. The tax cut
   lowers government saving. However, private saving might rise by the same amount if
   people anticipate the higher future taxes. They simply save the tax cut, and continue
   to consume the same amount as before. However, if Ricardian Equivalence doesn't
   hold, and households spend part of their extra disposable income, then national saving
   would in fact decline.

2. The unemployment rate is zero when the labor market clears.

   FALSE. As discussed in class, it takes time to match workers to firms. These 'search
   frictions' imply that even in a well functioning labor market there will always be
   some amount of unemployment, although it may be difficult to precisely estimate
   what this number is. Hence, even when the labor market 'clears' there will be some
   unemployment.

3. In the Solow model, an increase in the savings rate increases the economy's growth
   rate.

   TRUE and FALSE. In the Solow model, an increase in the savings rate will produce a
   temporary increase in the growth rate, but not a permanent increase.

4. Productivity increases cause current account surpluses.

   UNCERTAIN. It depends on whether it is temporary or permanent. A temporary
   productivity increase does not affect the future MPK; it just raises current output
   and income. Hence, it raises saving (consumption-smoothing) and does not affect
   investment. This would produce a current account surplus (or reduce a pre-existing
   deficit). If the productivity increase were permanent, then saving would not respond,
   since households would simply raise consumption in proportion to their permanently
   higher income. However, now investment would increase. The combination of rising
   investment, with little or no change in saving produces a current account *deficit*.

5. Faster money growth causes inflation to increase.

UNCERTAIN. We know from the quantity equation that $\frac{\Delta M}{M} + \frac{\Delta V}{V} = \frac{\Delta P}{P} + \frac{\Delta Y}{Y}$. Hence, an increase in $\frac{\Delta M}{M}$ must be matched by some combination of an increase in $\frac{\Delta P}{P}$, an increase in $\frac{\Delta Y}{Y}$, or a *decrease* in $\frac{\Delta V}{V}$. Empirically, in the long-run, an *exogenous* increase in $\frac{\Delta M}{M}$ will produce a matching increase in $\frac{\Delta P}{P}$, so in that sense the answer is true. However, if $\frac{\Delta M}{M}$ is rising in combination with an increase in growth, which produces an increase in money demand, inflation might not be affected at all.

The following questions are short answer. Briefly explain your answer. Clarity will be rewarded.

6. (20 points). Suppose the (per capita) production function is $y = \sqrt{k}$. Also suppose the savings rate, s, is 16%, the population growth rate, n, is 3%, and the depreciation rate, δ, is 5%. (There is no technological progress, i.e., $g = 0$). (a) Calculate the economy's steady-state capital/labor ratio and income per capita. (b) Is this economy above or below the Golden Rule?

(a). Steady-state: $sk^{1/2} = (n + \delta)k$. Therefore, $k = [s/(n + \delta)]^2$. Plugging-in the numbers gives, $k = (.16/.08)^2 = 4$. Therefore, $y = \sqrt{4} = 2$.

(b). From class, we know the Golden Rule saving rate is α (capital's share), which in this case equals 1/2. Therefore, since $s < .5$, we know the economy is *below* the Golden Rule.

7. (20 points). On the planet Vulcan, the velocity of money is constant. Real GDP grows by 4% per year, the money supply grows by 10% per year, and the nominal interest rate is 9%. What is the real interest rate?

Using the notation from class, when velocity is constant we know

$$\mu = \pi + g$$

From the Fisher equation, we know

$$i = r + \pi$$

Therefore, $\mu = (i - r) + g$. Plugging in the numbers gives $.10 = .09 + .04 - r$. Therefore, $r = .03$.

8. (20 points). Compare and contrast how 'closed economies' and 'small open economies' respond to a fiscal expansion. Use graphs if you want.

A fiscal expansion corresponds to $G \uparrow$ or $T \downarrow$. A *temporary* fiscal expansion causes a decline in saving. This raises interest rates in a closed economy. In a small open economy it produces a current account deficit instead. A *permanent* fiscal expansion does not affect either saving or investment (at least to a first-order approximation). Hence, the the 'responses' would be the same in both cases. (See lecture 7 slides for more discussion).