CONCORDIA UNIVERSITY
Econ 304 Intermediate Macroeconomics II

Assignment #2
DUE DATE: OCTOBER 23, 2015 by 2:30pm, in my mailbox (Econ Dept)

Answer all the questions. Justify your answers with explanations and/or graphs.

1. (5 points) "Canada's unemployment rate rose to 7.1 per cent in September, the highest level in more than a year, as more Canadians tried to find work amid weak economic conditions. […] In September, public and private employers shed 18,600 jobs while self-employment jumped by 30,800 – a potentially worrying development." *(The Globe and Mail, Oct. 2015)*
    - Refer to the excerpt above to explain why the increase in the number of self-employed jobs is not preferable for the economy.

    The increase in the unemployment rate is due to the increase in labour force, as more workers tried to find work. Here is the opinion of Charles St-Arnaud, executive director of economics at Nomura International PLC: "The increase in self-employment can sometimes be concerning as it can be viewed as a transition between employed and unemployed, where someone losing his job tries to make it as a consultant or starting a small business,". Over the past year, self-employment rose 2.5 per cent.

2. (5 points) This problem uses the Solow model to analyze the effects of immigration. Suppose that the economy is initially in the steady state.
    - Suppose that there is a one-time increase in the labor force from immigration, but n (the population growth rate) remains constant. Analyze the short-run and long-run effects of this change for the levels of per-capita output, and the growth rates of output per-capita.

    Since the increase in labour force is temporary, N increases, but not n, the growth rate in the economy's population. When N increases, the capital per worker k decreases. As output is directly and positively dependent on k, per capita income will fall (y and w decrease). Notice that total output increases, assuming that the immigrants find jobs and are working. In the long run, the economy begins to accumulate capital in order to equip the new workers with the same, long run capital/labour value. As workers become more productive (wages increase), so does per capita aggregate production, y.
    Textbook reference for graph and further explanations: p 230 chapter 7

3. (5 points) Would devoting a large share of national output to investment would help restore rapid productivity growth and rising living standards? Explain.

Devoting a large share of national output to investment means raising the saving rate. Assuming that the economy is initially in steady state, this generates some positive growth during the transition path to the new steady state, and a higher steady state level of capital per head and income per head. So living standards will indeed be higher. But once the new steady state is reached, growth in capital per head is indeed zero, so this cannot sustain rapid growth in the long-run.
Textbook reference for graph and further explanations: p 226 chapter 7

4. (10 points) Consider the following Solow model. Total output is given by $Y = zK^{\frac{1}{3}}N^{\frac{2}{3}}$ where K is the aggregate capital stock, N denotes the workforce, and z denotes total factor productivity. Assume that $z = 1$. Saving/investment is equal to 10% of output. Capital depreciates at a rate of 8% per year, while the work force grows at a rate of 2% a year.
In the Solow model, the steady-state capital per capita, y^*, satisfies the following equation:

$$s \cdot z(k^*)^{\frac{1}{3}} = (n + d)k^*$$

where s denotes the saving rate, n denotes the growth rate of the labor force, and d denotes the depreciation rate.

- Prove the equation above using the equation 7.18 in the textbook. Give a brief interpretation of the left-hand side and the right-side of the equation above.
- Calculate the steady state quantities k^* and y^*.

We derived in class the steady state condition for the general form for the production function. Here, $Y = zK^{\frac{1}{3}}N^{\frac{2}{3}}$, becomes in terms of per capita variables: $\frac{Y}{N} = z\frac{K^{\frac{1}{3}}N^{\frac{2}{3}}}{N}$, so $y = zk^{\frac{1}{3}} = k^{\frac{1}{3}}$ since $z = 1$ in the problem.
The capital stock per capita at steady state, k^*, depends on investment per capita (or savings per capita accumulated or capital stock per capita accumulation or the increase in the stock of equipment, machinery, etc. accumulated) and it's value is diminished by depreciation and population growth.

The values for , k^* and y^* are obtained by plugging in the values given for s, d and n. $k^* = 1$ and y^*=1.