Macro Problem Set 2

Q1

Visit the Singapore Ministry of Manpower's website (specifically the *Labour Force In Singapore, 2021* report), and search for information about the following manpower categories for **residents aged fifteen years and over**.

- In the labour force.
- Unemployed workers.
- Discouraged workers.
- Unavailable job seekers and available potential job seekers.
- Time-related under-employed workers.

Manpower Research and Statistics Department, Ministry of Manpower (2022): *Labour force in Singapore 2021.* https://stats.mom.gov.sg/Pages/Labour-Force-In-Singapore-2021.aspx

a. For each category (i) report the available numbers for June 2021, and (ii) compare the category with the closest equivalent category used in the lecture videos (i.e., are they the same? if different, how so?).
b. How might one use the categories to build a measure of labour under-utilization for Singapore that resembles the U-6 category for the United States?

Q2 (For tutorial discussion, submission is not required)

Read the commentary titled "Vaccine patent row shows need to rethink intellectual property" by Tim Harford (yes, *that* Tim Harford), writing in the Financial Times and reproduced in Channel News Asia (also available for download in LumiNUS).

a. What are patents and copyrights? How does Harford explain their roles in fostering innovation?
b. Was the government's role in the creation of COVID-19 vaccines solely based on its protection of the patent system? More generally, is there a positive role for government in innovation beyond establishing intellectual property rights?

Q3 (For tutorial discussion; submission is not required)

Read this article by economist and columnist Noah Smith, titled "Try to answer the hardest questions in Economics", in Bloomberg Opinion, 20 August, 2018. The article is available for download on LumiNUS, or via this Public Link.

a. Why is the question of how poor countries become rich hard to answer?
b. Consider the 'old chestnuts handed down from Adam Smith and David Ricardo'. Which of these falls under "institutional conditions" as discussed in lecture, and which are "Classical Model" prescriptions for growth?
c. How do the countries in Studwell's "How Asia Works" conduct industrial policy without falling into its pitfalls?

Q4

Table 1 below contains data for Singapore in 2007 and 2008 obtained from the Department of Statistics. Real GDP is computed using the chain-linked approach with 2015 as reference year.

Table 1

	2007	**2008**	**2008 growth rate**
GDP in chained (2015) dollars	$291.3 billion	$296.8 billion	
Population	4.59 million	4.84 million	
Employment	2.63 million	2.86 million	
Average hours worked per week	46.3	46.3	
GDP per capita in chained (2015) dollars			
Employment-Population Ratio			

a. Complete the table.
b. Compare the 2008 growth rates for real GDP and real GDP per capita. Which of the two growth rates do you think politicians, the press and the business community pay more attention to? Which growth rate is a better indicator of progress in living standards?
c. Use the "growth equation" and the growth rates in the completed table to approximate the 2008 growth rate in labor productivity. Then do an exact computation of the 2008 growth rate in labor productivity. How good is the approximation?
d. Using the results from part c, explain the factors behind 2008 growth in real GDP per capita. Why could Singapore not continue to grow its real GDP per capita along these lines?

e. What policies would you recommend for Singapore to achieve more sustainable growth in real GDP per capita?

Q6

An important skill in economics is to translate between equations and diagrams. During lecture we used diagrams to examine the Classical Model's Loanable Funds Market. Here, we will examine the same market with algebraic equations. Sketch accompanying diagrams to guide your thinking.

An economy's *consumption function* is given by the following equation:

$$C = 300 - 2{,}000r + 0.8(Y - T)$$

Where C is consumption (in \$), r is the real interest rate (expressed as a number rather than a percentage[1]), Y is the economy's output (and thus households' total income) in \$, and T is net taxes (in \$).

The economy's *investment function* is given by the following equation:

$$I^P = 1{,}900 - 10{,}000r$$

Where I^P is planned investment (in \$).

Government purchases (G) are currently \$600 while net taxes are \$300, so the government incurs a budget deficit of $G - T$ = \$600 – \$300 = \$300.

The economy's potential output (i.e., output at full employment) is \$2,000.

a. Examine the coefficients for the real interest rate and disposable income in the consumption equation and investment equation. Are the signs for the coefficients sensible?
b. Fill in the blank: A crucial assumption in the Classical Model is that all markets clear. Hence, the economy's equilibrium output and income level is _____.
c. Using part (b), construct the loanable funds demand equation.
d. Using part (b), construct the loanable fund supply equation. Hint: saving is defined to be the remainder of disposable income after deducting consumption.
e. Using your demand and supply equations, find the equilibrium levels of the real interest rate, planned investment, consumption and saving.

[1] An interest rate of 5% per year is written as 0.05 in the equations.

Now we are ready to use the model to examine what happens when things change.

Suppose the government plans to eliminate its budget deficit so that resources are released for private investment.

f. One option is to reduce government purchases by $300.
   i. Which curve(s) are shifted, and in which direction and magnitude?
   ii. Using your (possibly new) demand and supply equations, find the new equilibrium levels of the real interest rate, planned investment, consumption and saving. Does Say's Law hold?

g. **(For tutorial discussion. Submission is not required)**. An alternative option is to increase net taxes by $300.
   i. Which curve(s) are shifted, and in which direction and magnitude?
   ii. Without doing further calculations, explain how the resultant change in the equilibrium level of planned investment differs from that found in part f.