Economic 1102-27 - Principles of Macroeconomics
Midterm Exam 1 Answer Key

1   Question Set 1 (20 points, 1 RP):
Definitions

Instructions: Provide the most complete answer you can.

1.1   *(3 pts) Define macroeconomics. How is it different from microeconomics?*

Macroeconomics is the study of economy-wide phenomena.
Microeconmics is the study of how individual consumers, or other small-scale actors, behave (in a market).

1.2   *(3 pts) Define Gross Domestic Product (GDP).*

The market value of final goods and services produced within the borders of a given country within a given period of time.

1.3   *(2 pts) What is the production possibilities frontier?*

The PPF shows the maximum amount that can be produced in an economy with the current resources and technology.

1.4   *(2 pts) State the law of supply and the law of demand.*

The law of supply states that as prices increase, quantity supplied should increase.
The law of demand states that as prices decrease, quantity demanded should increase.

1.5   *(4 pts) What is the demographic dividend? What two demographic statistics change as this "dividend" occurs (and how do they change)?*

The demographic dividend is an increase in economic growth because of an expanding working share of the population relative to the dependent (non-working) population.
Death rate must decrease.
Birth rate must increase.
(For full credit: say something along the lines of ... the increase in economic growth due to the population glut as death rates decline before the birth rates also begin to decline.)

1.6   *(3 pts) Define structural unemployment. Detail an example of someone unemployed who might fit under this category of unemployment.*

Structural unemployment is a type of unemployment caused by workers whose skills are not in demand by employers, who lack sufficient skill to obtain employment, or who cannot easily move to locations where jobs are available.
Any example of a person that fits in the category, like a farmer in New York City.

1.7 *(3 pts) Explain the concept of diminishing marginal returns of capital.*

Diminishing marginal returns of capital posits that for fixed labor, the output added by an extra unit of capital decreases as the amount of total capital increases.

1 RP Between 1980 and 2005 has consumption's share of GDP grown, decreased, or stayed the same? **(Grown)**

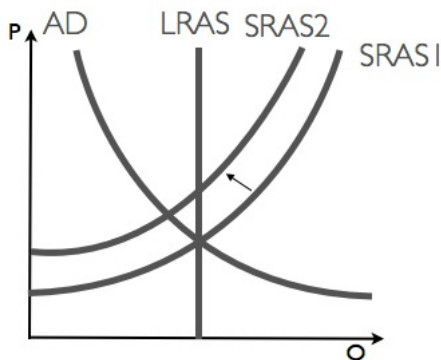# 2   Question Set 2 (30 points, 3 RP): Data / Graphical Analysis

Instructions: If you are asked to provide a graph, you must introduce an abbreviation at least once before using it (e.g. if you use AD, first indicate AD means aggregate demand).

2.1   *(10 pts) For the following questions, begin with an economy in AS-AD long-run equilibrium which is then hit by some event. Please draw a new diagram for each question.*

(+1) For specifying what SRAS, AD, LRAS stand for somewhere in this section.

a. *Imagine there is a oil shock as the price of oil unexpectedly increases. Depict the impact on your diagram. Explain at least one way the economy could return to long-run equilibrium (note saying SRAS, AD, or LRAS shifts back with no justification is not an answer).*
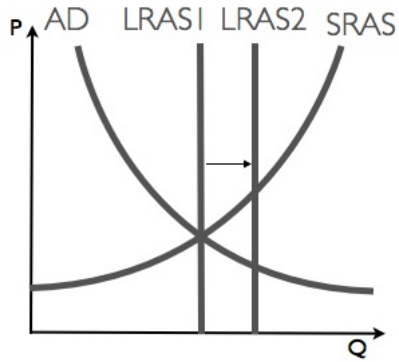
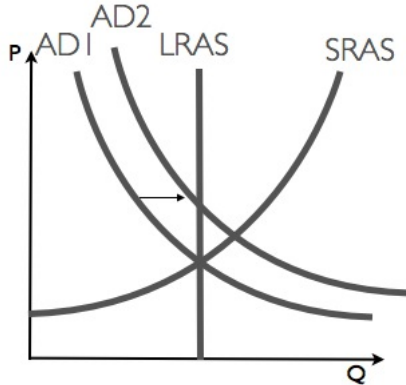 (a) Depict the shift correctly as a shift left in the short-run aggregate supply

 (b) E.g. the economy could return back to equilibrium by a positive shift in aggregate demand, caused by an increase in government spending, lower taxes, etc. Or any other reasonable alternative.

b. Suppose there is a large influx of immigrants into the economy so there is an increase in the labor supply. Depict the impact on your diagram. Explain how the economy could return to long-run equilibrium.

 (a) Depict the shift correctly as a shift right in the long-run aggregate supply.
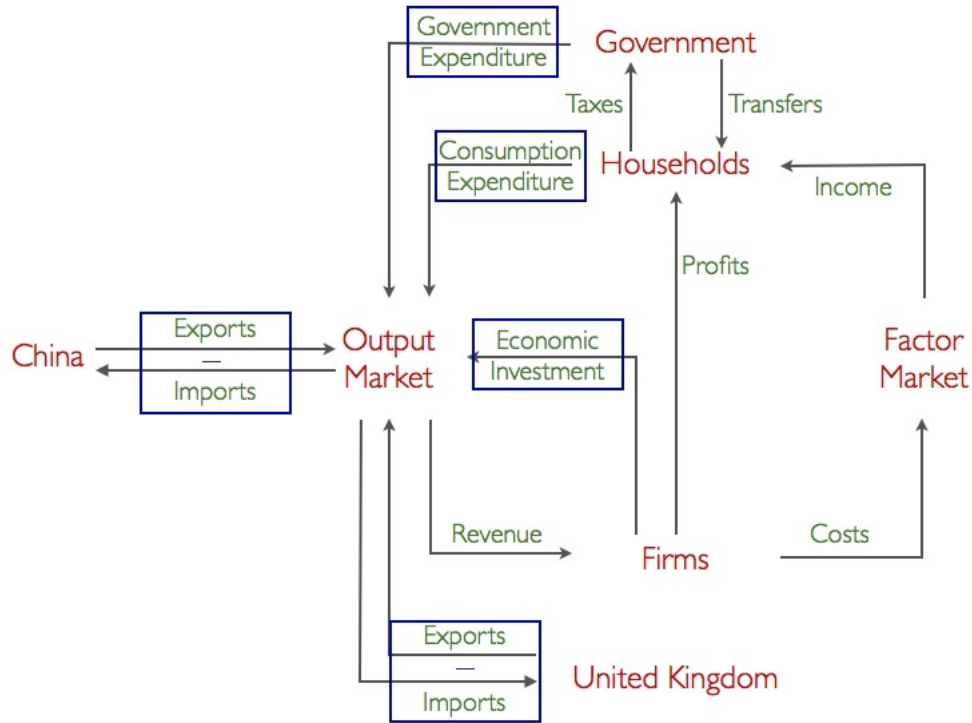
(b) E.g. the economy could return to equilibrium by a positive shift in aggregate demand, perhaps through expanded demand because of the larger population, or by a shift right in the short-run aggregate supply, perhaps because more labor decreases wages and thus supply costs. Or some combination of the two with justification.

c. Finally, a new Apple product has arrived that has increased consumption expenditure across the economy and thus shifted aggregate demand. Depict the impact on your diagram. Price increases caused in this fashion are also known as? Explain how the economy could return to long-run equilibrium.

(a) Depict the shift correctly as a shift right in aggregate demand.

(b) This is demand pull inflation.

(c) E.g. the economy could return to equilibrium by a subsequent shift left in aggregate supply, perhaps because higher prices cause wage contracts to eventually be renegotiated higher and thus increase production costs.

2.2 *(10 pts) Draw and completely label a money flow diagram for the US with five agents–consumers, firms, the government, China, and the United Kingdom–and two places of exchange–the output market and factor market. Mark the components that would be used to calculate US GDP.*

2.3 *(10 pts) Suppose the following is an exhaustive list of economic activity related to the US in 2011 unless otherwise stated. Calculate 2011 US GDP and provide justification for each step of your calculation:*

a. *Alcoa produced $4500 worth of aluminum in the US and sold $4000 worth to Steve in 2010, and $250 worth to Melinda in 2011.*

b. *Steve makes computers and uses the $4000 worth of aluminum to manufacture $10000 worth of computers in the US. $3000 worth are sold to Americans, and $7000 worth are sold elsewhere in the world. Additionally, Steve manufactures $5000 worth of computers in Brazil and sells them exclusively to Brazilians.*

c. *Steve's company buys $200 worth of capital from Bill.*

d. *Melinda purchases $250 of Alcoa's aluminum and makes a small birdhouse for personal use worth $300.11*

e. *The government buys $500 of timber from a Canadian company that produces in Canada, and $1000 worth of airplanes from a domestic company.*
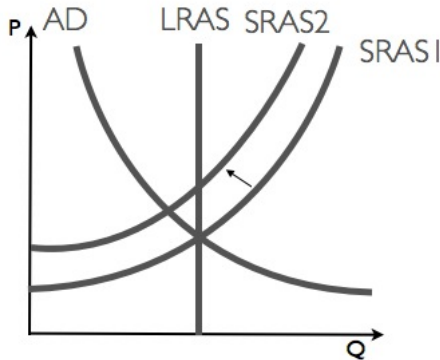
a) The $4000 worth to Steve in 2010 is irrelevant to 2011, only $250 is sold as a final good in 2011. So +C=$250. The last $250 of aluminum must be stored inventory (and thus not counted) since it is not used by anyone.

b) There are $3000 in consumption and $7000 in exports. Brazilian consumption of Brazilian goods are irrelevant to US GDP. So +C=$3000, +Ex=$7000

4

c) Investment of \$200 because capital is a capital investment. SO +I=\$200

d) The \$300 birdhouse is not sold on the market and so has no impact on GDP. The \$250 aluminum is technically an intermediate good but is actually a final good from the perspective of the market.

e) Government spending is \$1500. Imports are \$500. So -Im=\$500, +G=\$1500

Therefore, GDP = 250+3000+7000+200+1500-500 = \$11450

1 RP Define cost-push inflation, or depict it on a fully marked graph.

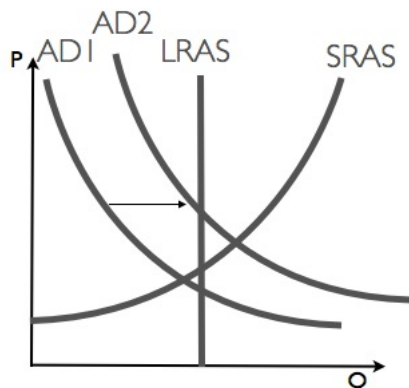(**Inflation caused by higher production costs.**)

2 RP What are two of the three explanations for why aggregate demand is downsloping (you can list the effects)? **Wealth effect, interest rate effect, net export effect**

3 Question Set 3 (25 points, 2 RP): Policy and Short Answer

Instructions: For open-ended questions, you must provide economic intuition from class as justification for your answers.

3.1 *(10 pts) Imagine you are a macroeconomist (not to worry, just briefly) and have been hired by the government to make certain policy recommendations. For the following questions, you will be given a policy goal. Explain what actions could be taken to meet those goals. You may use a graph to motivate your answer, but it must be properly labeled and explained.*

a. *Raise the average salary of the labor force. Could there be any unintended side effects? What are they and under what circumstances would they occur?*

   (a) E.g. – Issue a minimum wage that is higher than the average wage of the labor force.

   (b) E.g. – If the minimum wage is effective, that is is a binding price floor, then unemployment will increase.

b. *Boost aggregate demand to fight a potential recession. Be specific with your response. Additionally, on an AS-AD graph, show potentially negative side-effects of boosting demand in this situation.*

   (a) E.g. – Raise government spending

   (b) E.g. – A stimulus package could increase aggregate demand beyond the correct level for equilibrium, in which case the economy is still out of equilibrium.

3.2 *(5 pts) Assess the following statement, "Capital growth is more important to the economic growth of lower income countries, while technology growth is more important to the growth of higher income countries." Use the Solow model to support or discredit this claim.*

The Solow model claims that growth is a function of growing capital stocks for a given level of labor. As capital stocks rise with investments higher than depreciation, national wealth per laborer also increases. For poorer countries with low levels of capital, growth in capital is still a reasonable way to expand national wealth. The Solow model also predicts, though, that an economy will eventually stop growing, i.e. that capital stocks will reach a steady state. This is a concern more relevant to developed economies with higher levels of capital. The only way to move beyond this steady state is to improve technology.

3.3 *(4 pts) Recall that the President of the Federal Reserve Bank in St. Louis was recently criticized for (approximately) claiming that the burst of the housing bubble had an impact on the natural rate of output of the US. Do you agree or disagree with his claim? Explain the position you take.*

My impression: Disagree because the natural rate of output is a function of labor, technology, natural resources, and capital, none of which is directly affected by the loss of national wealth.

3.4 *(2 pts) List two common criticisms of the measurements of official unemployment figures in the United States.*

(Official answers, anything reasonable is acceptable) 1) Because discouraged workers are not included, unemployment figures undercount true unemployment. 2) Figure does not measure job quality (i.e. measure if someone is underemployed). 3) Does not include people without home addresses. 4) Does not include informal people or jobs on the black market.

3.5 *(4 pts) What is the difference between nominal and real GDP? Give one reason why economists favor using real GDP over nominal GDP in assessing a country's economic well-being.*

Nominal GDP is measured using current market prices, while real GDP has been adjusted to use prices from some base year.
One possible response: 1) Nominal GDP is susceptible to inflation so high inflation can erroneously make it appear as if a country has greatly expanded output.

2 RP What are three of the four determinants of long-run aggregate supply? **Labor, Capital, Technology, Natural Resources**

4   Question Set 4 (25 points):
Calculations

Instructions: Use the provided data at the end of the test packet to answer the following questions about Macworld and Appleland. To obtain full credit, you MUST show how you obtained your answer.

4.1   *(4 pts) What is Macworld's nominal GDP in 2005?*

$$p_{DC}^{2005} q_{DC}^{2005} + p_{B}^{2005} q_{B}^{2005} = \$1,950,000$$

4.2   *(3 pts) What is Macworld's real GDP in 2005?*

$$p_{DC}^{2003} q_{DC}^{2005} + p_{B}^{2003} q_{B}^{2005} = \$673,000$$

4.3   *(3 pts) What is Appleland's real GDP in 2005?*

$$RGDP = \frac{NGDP}{Deflator} \times 100 \text{ so } RGDP = \frac{\$567,327}{130} \times 100 = \$436,405.38$$

4.4   *(2 pts) What is the size of Appleland's population?*

$$20 + 36 + 5 + 12 + 15 + 12 = 100$$

4.5   *(2 pts) What is Appleland's real GDP per capita in 2005?*

$$RGDP/capita = \frac{RGDP}{Population} = \frac{\$436,405.38}{100} = \$4,364.05$$

4.6   *(2 pts) What was the inflation rate in Appleland between 2004 and 2005?*

$$Inflation_{04-05} = \frac{Deflator_{2005} - Deflator_{2004}}{Deflator_{2004}} \times 100 = 4\%$$

4.7   *(3 pts) What is the size of the labor force? What is the participation rate in Appleland?*

$$Labor = Employed + Unemployed \text{ seeking job} = 48. \ Participation = \frac{Labor}{Population} \times 100 = 48\%$$

4.8   *(6 pts) Suppose the government of Appleland spends \$10. What is the total effect on aggregate demand? What if the government sends each person (everyone in the population) a \$1 check?*

If the government spends \$10, this is the initial injection (CISOM). To calculate the total effect on aggregate demand, use the multiplier $M = \frac{1}{1-MPC} = \frac{10}{3}$. So $\Delta AD = M \times CISOM = 33.33$. In the second case, the total addition to consumer wealth is \$100 (\$1 for each of the 100 people in the population). They each spend only .7 of it so the initial injection is \$70 in aggregate. Therefore, $\Delta AD = M \times CISOM = \frac{10}{3} \times 70 = \$233.33$.

Data for Section 4

Figure 1: **Macworld's Economy**

Suppose Macworld produces diet coke, batteries, and paper, purchased by consumers in Macworld.

Base year = 2003

Year	Bottles of Diet Coke	Price by Bottle	Batteries	Price per Battery
2003	100,000	$1.25	2,000	$16
2004	400,000	$3.50	1,500	$20
2005	500,000	$3.75	3,000	$25
2006	800,000	$4.25	4,000	$32

Figure 2: **Appleland's Economy**

We have the following information on Appleland:

Marginal propensity to consume = 0.7

Employment Statistics					
Children under 16	Employed	Not employed, Not seeking job	Not employed, Seeking job	In Jail	Retired
20	36	5	12	15	12

GDP Statistics (Base year = 2003)		
Year	Nominal GDP	GDP Deflator
2003	$430,250	100
2004	$600,350	125
2005	$567,327	130
2006	$300,252	98