International Economics and Business Dynamics
Midterm Examination

Instructions: there are 7 questions below. Each is worth the same amount of points. Please Answer 6 of the 7 questions

Time allowed: 1h and 30 minutes

Question 1
Apple (a US company) produces 1 million of I-phones in China paying local workers 10 millions of dollars. The Iphones are then exported from China to an Italian cell phone provider for 40 millions (so Apple makes a profit of 30 millions). The Italian provider sells them to Italian consumers for 100 millions . Compute the impact of these transactions on GDP, GNP and Current Account of US, China and Italy.

Question 2
Assume that in year 2010 a country produces 10 cars and 5 bicycles. The CPI basket of that country includes 1 car, 2 bicycles and 10 gallons of gas (which are imported). Suppose that in 2010 the price of a car is 100$, the price of a bicycle 20$ and the price of a gallon of gas 1$. In 2011 the country produces 10 cars and 10 bicycles and the prices of cars and bicycles are unchanged but the price of a gallon of gas increases to 2$.
Compute the CPI and GDP deflator in 2010 and 2011. Explain why CPI inflation likely overstates the true cost of changing gas prices.

Question 3
Some economists argue that US right now is under the danger of the "twin deficits" i.e. simultaneous increasing government deficit and increasing current account deficit. Explain why an increase in government deficit can lead to an increase in the current account deficit but also explain why this is not necessarily the case i.e. under what conditions you would observe an increase in government deficit without a corresponding increase in CA deficit?

Question 4
Analyst Nouriel Roubini recently, commenting on anemic and subpar growth of developed economies, stated that "*Europeans believe that the low growth is related to structural factors, namely a lack of fiscal discipline and delays in structural reforms.*"
Why and how would fiscal discipline affect growth?
Can you give an example of a structural reform that would affect growth?

Question 5

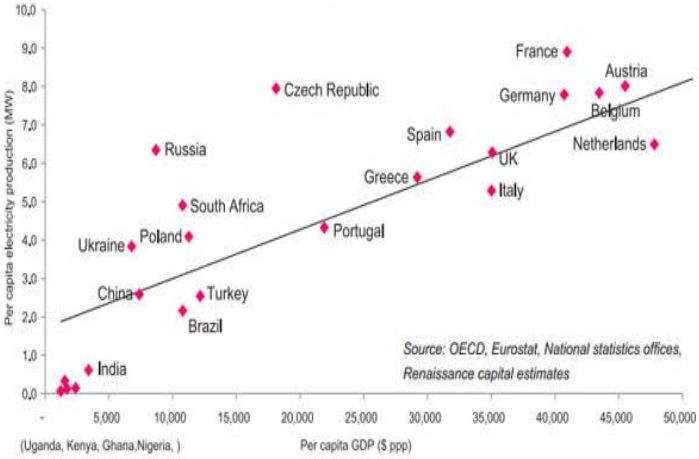
Consider a country which has the following aggregate production function $Y=K^{0.5}L^{0.5}$. Assume that the country saves 30% of its output and that capital in the country depreciates at 15% per year. Assume that population in the country is 1000 and that everybody works (so L=1000).
Plot the relation between capital per worker and output per capita.
Solve for steady state total GDP, GDP per capita and capital stock per capita.
Assume now that due to a too generous pension system 50% of the population stops working. Compute the new steady state GDP per capita.

Question 6

Consider one country in which there are only two firms. Both firms produce goods using a so-called A-k technology, i.e. if a firm invests k units of capital it will produce Ak units of bread. For firm 1 A=1, for firm 2 A=1.1. Suppose there are competitive banks in the country which receive 1000$ worth of deposits from consumers and allocate them to firms.
How would be the deposits allocated across firms?
What would be the resulting TFP of the country?
Suppose now the government passes a law stating that both firms should receive equal funds. How does the law affect GDP and TFP?

Question 7

The graph below relates Energy production to GDP per capita in several countries. Suppose that India is thinking of massive investment in energy that would increase its energy production to the level of Brazil's production. Does the graph suggest that this investment would lead to an increase in GDP per capita in India? Why or Why not? If not what kind of evidence would you want to assess the impact of increasing energy production on GDP?



Suggested Solutions

Question 1

	GDP	GNP	CA
USA		+30	+30
ITA	+60	+60	-40
CHINA	+40	+10	+10

Question 2

2010 Price of CPI basket: 1*100+2*20+10*1= 150
2011 Price of CPI Basket: 1*100+2*20+10*2= 160

2010 GDP Deflator: Nominal GDP/Real GDP (base 2010) = 1
2011 GDP Deflator: Nominal GDP/Real GDP (base 2010) = (10*100+10*20)/(10*100+10*20)=1

Note that since prices of bikes and autos do not change then GDP deflator does not change. The CPI is a fixed basket index and thus it does not take into account that when the price of gas change consumers will substitute away from Gas and thus will actually spend less. So it does overstate the true impact of price changes on consumer expenditures.

Question 3
From National accounting we know that
S(p) + S(g) = I + CA
If government deficit increases then government saving S(g) falls so, keeping everything else constant, CA should fall (that is the country runs a larger CA deficit). Notice though that if when S(g) falls also I falls or S(p) increases, a CA deficit does not necessarily ensue.

Question 4
There are several channel through which fiscal discipline could affect growth. One we have studied is that governments which spend a lot (lack of fiscal discipline) have to tax consumers and firms a lot. Taxes are a form of diversion policy and as so reduce incentive to invest and hence growth.

A structural reform that can effect growth is, for example, a reform that increases in competition in a given sector as that would lead to entry of new firms that will use more efficient technologies.

Question 5

-Standard Solow Graph (lecture 6, fig. 1)

-Solving for steady state yields $s*k^{0.5}=delta*k$ -> $k=(s/delta)^2=4$ where k is capital per capita

-Output per capita is 2 and total output is 2000.

- If 50% of the population stops working output per worker is unchanged but now total output is 2*500=1000 so output per capita is 1.

Question 6

Since firm 2 is always more productive that firm 1 then that firm should receive all the funding. Under competition a bank which lends to the inefficient firm would not receive any deposit as it would not be able to pay competitive rates. Since the TFP of that firm is 1.1. the TFP of the country is also 1.1. If such a law passes then GDP would be 500*1+500*1.1=1050 and TFP would be 1050/1000=1.05.

Question 7

No the graph shows a correlation which does not imply causality. One type of evidence that could help understand the effect of energy production on GDP would be a study in which an international institution decides (in a random fashion), to build a power plant in a country and then it studies the effect of the plant on GDP of the country.