

ECON 333: PROBLEM SET # 2

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1. A country's real GNP and population are given below for the period 1779-1789.

Year	GNP	Population
1779	286.5	151.7
1780	330.8	154.3
1781	348.0	156.9
1782	366.8	159.6
1783	366.8	162.4
1784	400.0	165.3
1785	421.7	168.2
1786	444.0	171.3
1787	449.7	174.1
1788	448.0	177.1
1789	487.9	180.8

Calculate the annual average growth rates of GNP, population, and per capita income during 1779-1784 and 1785-1789 and also for the period 1779-1789.

2. An empirical investigation of a certain country reveals that during the period 1950-1989 its stock of capital and the labor force are exponentially growing at the annual rates 7% and 3% respectively. National income statistics of the country show that the average income shares of capital and labor during the period are .3 and .7 respectively. Assume that capital and labor are the only factors of production, the total productivity is growing at the rate 2% per year, and GNP at time t is given by the production function $Y(t) = A(t)F(K(t), L(t))$, and F exhibits constant returns to scale.
 - (a) Write down the formula for growth in output in terms of the growth in capital and labor (Just write the formula, you do not have to derive it).
 - (b) At what rate the GNP is growing during the period.
 - (c) What is the exponential growth rate in per capita income (assume that each person supplies one unit of labor)?
 - (d) The new supply side economic policy regime encourages higher savings rate. It is expected that as a response to the new policy the capital will grow at the rate of 10% per annum. What will be the new growth rates for GNP and per capita income of the economy?
 - (e) Suggest at least three government policies that may encourage one to save more. Explain why you think so.
 - (f) What are the components of "effective" labour hours? Suggest government policies that can increase effective labor hours of the economy through each of these components.
 - (g) What are the components of total capital investment in an economy? Suggest policies that can increase each of these components and hence the growth in capital of the economy.
 - (h) What are the various ways the economy can have higher total factor productivity (TFP) growth? Suggest government policies that will be most effective in improving the total factor productivity of an economy.
3. Examine the table to answer the following questions:

Sources of growth	Japan:1953-1971	Korea:1963-1982	U.S:1948-1973
Output growth	8.81	8.13	3.79
<u>Contribution of</u>			
gr. in labor	1.85	3.31	1.42
gr. in capital	2.10	1.58	0.71
gr. in TFP	4.86	3.24	1.66

Source:

Kim and Park [1985].

Table 1: Growth accounting for Korea, Japan and the U.S.

- (a) In the light of growth experiences a developing country (Korea) and two developed countries (US and Japan), what could be attributed to the main source of high growth in the developing country. What kind of structural differences between the less developing countries (such as in Korea) and developed countries (such as US and Japan) we can attribute to that will be consistent with the observed sources of growth? (Think about one of the indicators we talked about while discussing the structural differences between developed and developing countries).
- (b) What are the main sources for Japan's higher growth than the that of the US. In the light of another fast growing developed country's experience, what policies would you recommend for the US to improve its growth rate?