

Department of Economics
Queen's University

ECON239: Development Economics

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Assignment #1

Due Date: 4.00pm, Monday October 4, 2010

Section A (40 percent): Briefly discuss the validity of each of the following statements. In your answer define or explain as precisely as possible any terms or concepts which are underlined, with particular reference to the context in which they are being used. The text for each answer should be no longer than a page, but you also should also include diagrams or examples where appropriate. They have equal value.

A1. Developing countries have been successful in achieving their Millenium Development Goals.

A2. Using purchasing power parity exchange rates to convert to US dollars distorts ones view of world inequality by making poor countries appear richer than they really are.

A3. In computing the Human Development Index, the logarithm of per capita GNP is used rather than its level. This implies that an increase in per capita GNP has less impact on the HDI for a rich nation than does a similar increment for a poor nation.

A4. Consider the following quintiles for two different income distributions

Quintile	1st	2nd	3rd	4th	5th
Incomes in Economy 1	5	9	13	22	51
Incomes in Economy 2	3	10	11	20	56

The Gini coefficient for Economy 2 is greater than that for Economy 1.

A5. According to the Solow model, a change in the population growth rate has no effect on per capita income growth.

Section B (60 percent): Answer the following questions. They all have equal value.

B1. The following table provides aggregate information for Canada over the past decade:

	Nominal GDP in millions of \$	Net investment income from non-residents (\$m)	Consumer Price Index	Population
2000	1,076,577	-28,032	95.4	30,685,730
2001	1,108,048	-31,353	97.8	31,019,020
2002	1,152,905	-28,868	100.0	31,353,656
2003	1,213,175	-28,590	102.8	31,639,670
2004	1,290,906	-26,306	104.7	31,940,676
2005	1,373,845	-25,748	107.0	32,245,209
2006	1,450,405	-14,239	109.1	32,576,074
2007	1,529,589	-19,556	111.5	32,931,956
2008	1,599,608	-18,595	114.1	33,327,337
2009	1,527,258	-21,441	114.4	33,739,859

- (a) Calculate real total GNP in millions of 2002 dollars for each year. An Excel file containing this data is available on the Assignments and Exams page of the Econ239 website.
- (b) Calculate real per capita GNP in each year in 2002 dollars. According to these figures, did the average Canadian get richer every year since 2000?
- (c) What was the average growth rate of real total GNP over the whole decade? What was the average population growth?
- (d) Use you answers from (c) to compute an approximation of the growth in real per capita GNP. How does this compare to a direct calculation of the growth in real per capita GNP using the answers from (b)?
- (e) What was the average rate of price inflation over the decade? How much of the growth in the nominal value of GNP was due to inflation?

B2. Use Table 4 in Lecture Notes 1 to answer the following. Suppose the poverty line for this economy is determined to be 2.1 income units.

- (a) What is the headcount index of poverty?
- (b) Calculate the total poverty gap, the average poverty gap and the normalized poverty gap.
Suppose that the government of this economy can affect poverty by transferring money to the poorest individuals. Suppose it is told by the World Bank that it will obtain favourable terms for its future loans if it reduces poverty by 50%.
- (c) What would be the cheapest way to reduce the headcount index by 50%? By how much would this reduce the poverty gap?
- (d) What would be the most equitable way to reduce the poverty gap by 50% ? What impact would this have on the headcount index?
- (e) What do you conclude from this exercise? Does it matter how poverty is measured?

B3. Consider a Solow economy that is closed, has no government sector and no technological change. Total savings in the economy amount to 15% of GNP each year, the labour force grows at 5% a year and 10% of the capital stock depreciates each year. The relationship between aggregate GNP and productive inputs is given by

$$Y_t = K_t^{\frac{1}{3}} L_t^{\frac{2}{3}}$$

- (a) In 2000 the initial labour force is 10 million workers and the initial capital stock is 5 million units. Compute the level of GNP and the GNP per worker in 2000.
- (b) Assuming that all savings are channeled into investment compute, the capital stock, K_t , and capital stock per worker, k_t , in 1997. What are the labour force and the implied level of GNP in 2001.
- (c) Using the same procedure for each year until 2009, create a table showing the evolution of Y_t , K_t , L_t , y_t and k_t over time.
- (d) Using graph paper, plot the relationship between k_t (on the horizontal axis) and y_t (on the vertical axis). Compute the marginal product of capital per worker between the years 2000 and 2001, and that between 2008 and 2009. Which is bigger and why?
- (e) Compute the capital–output ratio for this economy in each year. To what value do you think the capital–output ratio will eventually converge? Explain your answer using the theory discussed in class.