SOLUTIONS MANUAL

ECONOMIC GROWTH

SECOND EDITION

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Chapter 2
A Framework for Analysis

■ Solutions to Problems

1. Proximate causes are causes that *directly* affect the variable of interest. Low levels of physical and human capital, technology, and efficiency are all examples of a proximate cause of low GDP per capita.

2. Fundamental causes are causes that *indirectly* affect the variable of interest by systematically affecting one or many other causes that in turn affect the variable of interest. Possible fundamental causes may be government, culture, ethnic composition, rule of law, geography, climate, resources, and so forth. These causes affect GDP per capita by affecting the proximate causes of low GDP per capita.

3. To show different levels of factors of production, the figures must not intersect at the same level of output. To show different levels of productivity, the figures must have different slopes. In the figure below, Country 1 and Country 2 have the same level of output per worker. However, Country 1 has a higher level of factors of production than does Country 2, and Country 1 has a lower level of productivity than does Country 2.
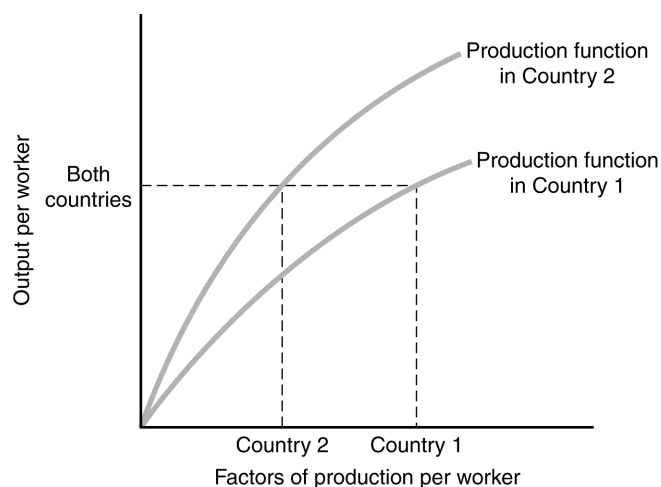
4. In the long run, the two countries would be expected to have the same levels (and thus growth rates) of income, because they have the same fundamentals. In the short run Country B would be expected to have faster growth because the two countries are moving toward having similar income levels, but Country B is starting out with a lower level.

5. A correct solution is a variable that systematically rises or falls only because of a rise or fall in GDP per capita. Take for instance expenditures on unproductive luxury items. It is reasonable to conclude that as GDP per capita rises, individuals allocate a larger amount of money to purchasing unproductive luxury items. Hence, with a rise in GDP per capita, we should see an increase in expenditures on unproductive luxury items because of increased income. However, it is unreasonable to assume that a rise in expenditures on unproductive luxury items raises GDP per capita.

An example of an incorrect solution would be health. While it is reasonable to assume that a rise in GDP per capita will raise the health level of a country, it is also reasonable to say that a rise in health will result in a rise in GDP per capita. As income increases, there will be a larger amount of money to increase the health of the population. However, a healthier population is also able to work harder and increase income levels as well. In this situation, we have both direct and reverse causation.

6. Simply finding a correlation between being overweight and having a heart attack does not imply causation. The correlation could be due to a missing variable like genetics which may be a factor in a person's weight as well as put him or her at risk for a heart attack. Also, reverse causation may be the reason for the correlation if heart disease has incapacitated a person, thus making him or her unable to exercise which leads to obesity.

7. a. Although the majority of right-wing voters may live longer, the inference that being a political conservative is good for you is incorrect because correlation does not imply causation. A majority of right-wing voters may live longer, not because they are conservative but rather, because they lead healthier lifestyles that right-wing policies promote. Thus, we have an omitted third variable affecting both the choice of party affiliation and the length of life.

    b. Although people in hospitals are generally less healthy than those outside hospitals, the inference that one should avoid hospitals is incorrect because of reverse causation. That is, a majority of people go to the hospital because they are unhealthy in contrast to the reverse inference, whereby going to the hospital makes one unhealthy.

8. a. Positive Correlation. It is reasonable to assume that higher (lower) GDP per capita increases (decreases) available expenditure for printing books. Moreover, it is also reasonable to assume that a greater (smaller) number of books printed per capita increases (decreases) the level of education within a country, translating into higher (lower) levels of GDP per capita.

    b. Negative Correlation. The higher GDP is per capita, the more likely it is that basic nutrition needs of the population will be met, and the smaller the number of people suffering from malnutrition, the more likely it is that there will be a healthier labor force to produce higher levels of GDP per capita. Hence, higher GDP per capita should be correlated with lower fractions of people suffering from malnutrition and vice versa.

    c. No Correlation or Positive Correlation. There are two things to consider. First, does eyesight progressively deteriorate with age? Second, does the level of GDP positively affect both one's ability to diagnose and correct vision problems and one's life expectancy through access to better nutrition, health care, and so on? If one does not assume the above to be true, then there should be no correlation between life expectancy and the population that wears eyeglasses. On the other hand, if one does assume the above to be true, then one should see high life expectancy figures when one sees a high fraction of people wearing eyeglasses, for the simple reason that there is a large elderly population with poor vision able to afford glasses.

    d. No Correlation. There is no obvious relationship between the number of letters in a country's name and the number of automobiles per capita.