

**DISCUSSION QUESTION**

Name:

Instructor:

Course:

On June 29, 1956, President Dwight D. Eisenhower signed the Federal High Act, which established the Interstate Highway System. The highway system cost approximately \$130 billion and is more than 46,000 miles long, connecting both the east and west coast and northern and southern parts of the continental U.S. Source: [www.fhwa.dot.gov](http://www.fhwa.dot.gov)

- a) Most economists agree that the Interstate Highway System has increased economic growth in the U.S. Explain why.
  
  
  
  
  
  
  
  
  
  
- b) What particular industries have benefited most from the interstate highway system?
  
  
  
  
  
  
  
  
  
  
- c) If most economists agree that the Interstate Highway System has increased economic growth, why not continue to build interstate highways? For example, why not continue to build such that every town and municipality in the U.S. is connected via an interstate highway?

## PEER GROUP PROBLEM SOLVING

Name:

Instructor:

Course:

Suppose two countries, Lakeland and Mountainland, have production functions as follows:

$$Q = f(T, L, K, H)$$

Where  $Q$  is output,  $T$  is technology,  $L$  is land,  $K$  is physical capital, and  $H$  is human capital.

Lakeland's production function is given by:  $Q = T \times L \times K \times H$

Mountainland's production function is given by:  $Q = T(L^{0.5} \times K^{0.5} \times H^{0.5})$

Initially, Lakeland has the endowment:  $T = 1$ ,  $L = 3$ ,  $K = 8$ , and  $H = 2$  and Mountainland has the endowment:  $T = 2$ ,  $L = 16$ ,  $K = 100$ , and  $H = 9$ .

- a) What is the initial amount of output in Lakeland and Mountainland?
  
  
  
  
  
  
  
  
  
  
- b) Suppose the amount of physical capital increases by four percent per year in both Lakeland and Mountainland, while the other inputs remain constant. What is the value of output in five years in both countries?
  
  
  
  
  
  
  
  
  
  
- c) Which of these countries (Lakeland, Mountainland, both, or neither) experiences diminishing marginal returns to physical capital? Explain.

**IN-CLASS EXPERIMENT / ACTIVE EXERCISE**

Have students form groups of four or five and consider the following:

While campaigning, many presidential candidates make lofty promises regarding economic growth. For example, when announcing his presidential campaign on June 15, 2015, Jeb Bush promised “four percent growth, and the 19 million new jobs that come with it.” From 1948 to 2010, the average rate of economic growth is 2.8%. Source: <http://fortune.com/2015/06/18/jeb-bush-promises-4-growth-if-elected-u-s-president-can-he-deliver/>

- a) Do you think any president can realistically deliver a growth rate this high?
  
  
  
  
  
  
  
  
  
  
- b) What can a president do to try to increase the rate of growth for the economy?
  
  
  
  
  
  
  
  
  
  
- c) What factors may increase growth in overall GDP but not in GDP per capita?

## SOLUTIONS AND INSTRUCTOR NOTES

### Discussion Question

On June 29, 1956, President Dwight D. Eisenhower signed the Federal Highway Act, which established the Interstate Highway System. The highway system cost approximately \$130 billion and is more than 46,000 miles long, connecting both the east and west coast and northern and southern parts of the continental U.S. Source: [www.fhwa.dot.gov](http://www.fhwa.dot.gov)

- a) Most economists agree that the Interstate Highway System has increased economic growth in the U.S. Explain why.

*The interstate highway system has significantly decreased the costs associated with transporting goods and increased the mobility of people across the nation. This has increased the efficiency of both labor and capital which increases GDP per capita and raises living standards.*

- b) What particular industries have benefited most from the interstate highway system?

*Hotels, fast food chains, automobile companies, and oil and gas companies were some of the major beneficiaries.*

- c) If most economists agree that the Interstate Highway System has increased economic growth, why not continue to build interstate highways? For example, why not continue to build such that every town and municipality in the U.S. is connected via an interstate highway?

*There are diminishing marginal returns associated with continuing to build highways. In reality, the economy can only efficiently utilize so many highways. Thus, the benefit of building new highways will reduce over time. In addition to diminishing marginal returns, overbuilding highways could create other negative externalities like increased pollution and more traffic accidents.*

### Peer Group Problem Solving

Suppose two countries, Lakeland and Mountainland, have production functions as follows:

$$Q = f(T, L, K, H)$$

Where  $Q$  is output,  $T$  is technology,  $L$  is land,  $K$  is physical capital, and  $H$  is human capital.

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Mountainland's production function is given by:  $Q = T(L^{0.5} \times K^{0.5} \times H^{0.5})$

Initially, Lakeland has the endowment:  $T = 1$ ,  $L = 3$ ,  $K = 8$ , and  $H = 2$  and Mountainland has the endowment:  $T = 2$ ,  $L = 16$ ,  $K = 100$ , and  $H = 9$ .

- a) What is the initial amount of output in Lakeland and Mountainland?

$$\text{Lakeland} = 1 \times 3 \times 8 \times 2 = 48$$

$$\text{Mountainland} = 2 \times (4 \times 10 \times 3) = 240$$

- b) Suppose the amount of physical capital increases by four percent per year in both Lakeland and Mountainland, while the other inputs remain constant. What is the value of output in five years in both countries?

*In Lakeland it will be approximately 58.4.*

*In Mountainland it will be approximately 264.*

- c) Which of these countries (Lakeland, Mountainland, both, or neither) experiences diminishing marginal returns to physical capital? Explain.

*Mountainland experiences diminishing marginal returns to physical capital. In Mountainland, the additional output from additional capital is increasing at a diminishing rate. In Lakeland, the additional output from additional physical capital is constant.*

### In-Class Experiment / Active Learning Exercise

Have students form groups of four or five and consider the following:

While campaigning, many presidential candidates make lofty promises regarding economic growth. For example, when announcing his presidential campaign on June 15, 2015, Jeb Bush promised “four percent growth, and the 19 million new jobs that come with it.” From 1948 to 2010, the average rate of economic growth is 2.8%. Source: <http://fortune.com/2015/06/18/jeb-bush-promises-4-growth-if-elected-u-s-president-can-he-deliver/>

*The purpose of this activity is to get students to consider the factors that determine economic growth and why it is difficult for politicians to simply create growth. After students have had approximately five minutes to consider and discuss the questions, ask for volunteers to discuss their answers in front of the class. Though there are no exact correct answers, here are some things to consider for each question:*

- a) Do you think any president has a realistic ability to deliver a growth rate this high?

*As with many campaign promises, it is based more on winning votes than on offering accurate estimates. In reality, it is unlikely for any President to achieve a four percent growth rate. This is especially true today, given that baby boomers are retiring and the share of the workforce employed is likely to be falling.*

- b) What can a president do to try to increase the rate of growth for the economy?

*Changing tax and spending policies can influence growth by altering business investment and the number of workers. However, the President will have to work with Congress to enact any major fiscal policies. Also enacting policies to increase R&D, human capital, and improved infrastructure can all lead to higher growth rates. But it also takes time for the impact of any policy to be felt in the economy.*

- c) What factors may increase growth in overall GDP but not in GDP per capita? Which factor of economic growth is most important, and why?

*An increase in the labor supply will increase GDP but will not affect GDP per capita. Productivity is the most important since any increase in productivity will also increase both GDP and GDP per capita.*

*For more in-class experiment and active learning ideas, visit [www.econedactive.com](http://www.econedactive.com).*