

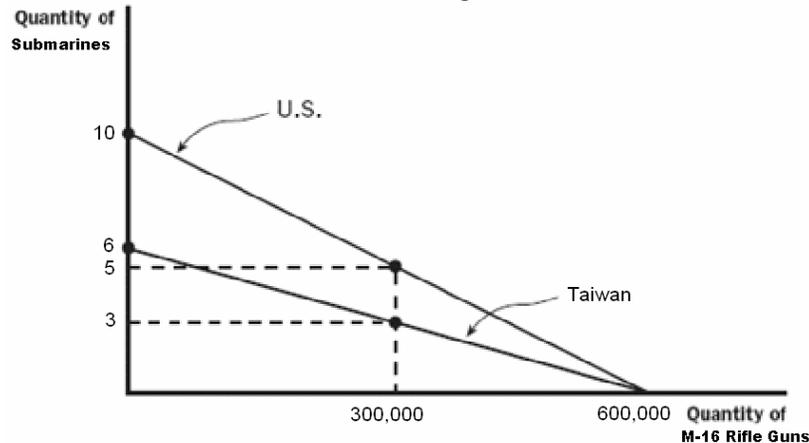
Principles of Economics I: Microeconomics Midterm SAMPLE QUESTION [11/6/2007]

Note: This is a sample question, and will NOT appear in the midterm.

1. Suppose that in a year an American war factory can produce 600,000 M-16 rifle guns or 10 submarines, while a Taiwanese war factory can produce 600,000 M-16 rifle guns or 6 submarines.
  - a. Graph the production possibilities frontier for each of the two countries. Suppose that without trade the workers in each country spend half their time producing each good.
  - b. If these countries were open to trade, which country would export submarines? Give a specific numerical example where both countries would benefit from trade and show it on your graph.
  - c. Explain the range of the price of a M-16 rifle gun (in terms of submarines) for which the two countries might trade.
  - d. Suppose that Taiwan catches up with American productivity so that a Taiwanese war factory can produce 600,000 M-16 rifle guns or 10 submarines. What pattern of trade would you predict now? How does this advance in Taiwanese productivity affect the gains from trade of the two countries?

Suggested Answers to Midterm Sample Question:

1. a. The production possibilities frontiers for the two countries are shown in the below figure. If, without trade, a U.S. war factory spends half of its time producing each good, the United States will have 300,000 M-16 rifle guns and 5 submarines. If, without trade, a war factory in Taiwan spends half of his time producing each good, Pakistan will have 300,000 M-16 rifle guns and 3 submarines.



- b. For the United States, the opportunity cost of one submarine is 60,000 rifle guns, while the opportunity cost of one rifle gun is  $1/60,000$  submarine. For Taiwan, the opportunity cost of one submarine is 100,000 rifle guns, while the opportunity cost of one rifle gun is  $1/100,000$  submarine. Therefore, the United States has a comparative advantage in the production of submarines and Taiwan has a comparative advantage in the production of M-16 rifle guns.

The United States would export submarines. The price of a submarine will fall between 60,000 and 100,000 rifle guns. An example would be a price of 80,000 rifle guns. In other words, Taiwan could export 80,000 rifle guns and receive one submarine in return. Both countries would benefit from trade. Taiwan would specialize in M-16 rifle guns (producing 600,000) and export 320,000. This would leave them with 280,000 rifle guns. In return, they would get 4 submarines. The combination of 280,000 rifle guns and 4 submarines was not available to Taiwan before trade. The United States could specialize in submarines (producing 10) and export 4 submarines to Taiwan in exchange for 320,000 rifle guns. The United States would end up with 6 submarines and 280,000 rifle guns, a combination that was impossible without trade.

- c. The price of an M-16 rifle gun would fall between  $1/60,000$  and  $1/100,000$  submarines. If the price was below  $1/100,000$  submarines, Taiwan would not be willing to export rifle guns because the opportunity cost of a rifle gun for Taiwan is  $1/100,000$  submarines. If the price was greater than  $1/60,000$  submarines, the United States would not be willing to import rifle guns because (for the United States) the opportunity cost of a rifle gun is  $1/60,000$  submarines.
- d. Once the productivity is the same in the two countries, the benefits of trade disappear. Trade is beneficial because it allows countries to exploit their comparative advantage. If Taiwan and the United States have exactly the same opportunity cost of producing submarines and M-16 rifle guns, there will be no more gains from trade available.