University of Macerata - **Economics** - **Dr. Mattia Tassinari**

Exercises on "Market supply and demand"

Exercise 1

Consider a hypothetical demand curve for the laser printer market. Show graphically and briefly describe what happens in correspondence of the following market changes:

a. the price of laser printers goes down
b. the average income of the population increases
c. the price of ink cartridges increases
d. the tastes of consumers are changing: they prefer to keep their photographs and documents in digital format rather than in paper format.

Exercise 2

Consider a hypothetical supply curve for the electric bicycle market. Show graphically and briefly describe what happens in correspondence of the following market changes:

a. the price of electric bicycles increases
b. technological progress reduces the cost of producing electric batteries
c. the government removes subsidies for electric bicycle manufacturers
d. the price of electric scooters (monopattini) increases significantly.

Exercise 3

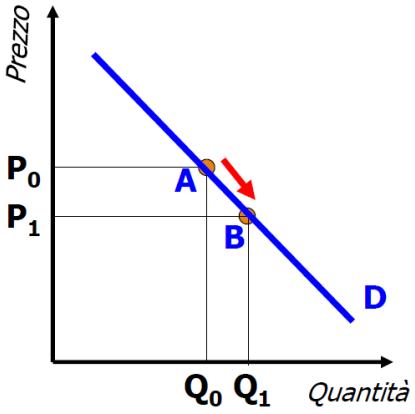
Consider a hypothetical market (supply and demand) for air conditioners. Show graphically and briefly describe what happens in correspondence with the following market changes:

a. climate change increases the need for cooling for consumers
b. the government imposes a tax on those who have an air conditioner
c. the price of copper necessary for the production of air conditioners increases
d. the introduction of robotic assembly systems for air conditioners reduces production costs.

SOLUTIONS

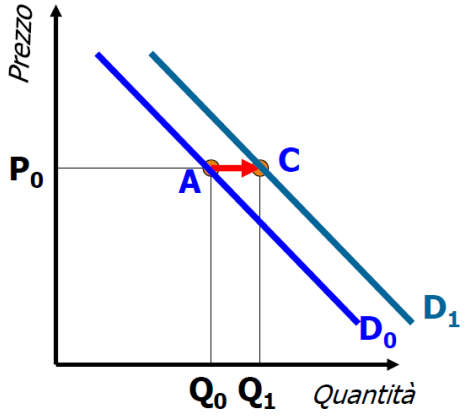
Exercise 1

a. the price of laser printers goes down



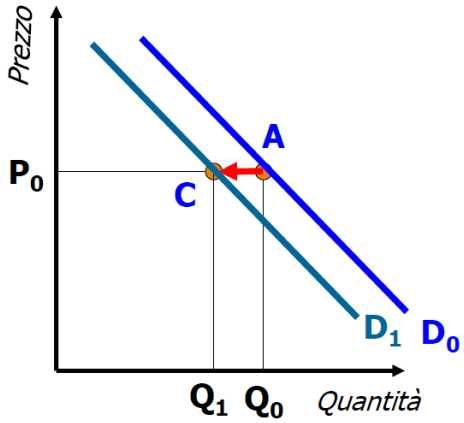
A reduction in the price of printers from P0 to P1 (other conditions being equal) causes the reaction of consumers in that market, who will demand printers in greater quantities, passing from quantity Q0 to Q1. Graphically this change is represented by a movement along the demand curve from A to B.

b. the average income of the population increases



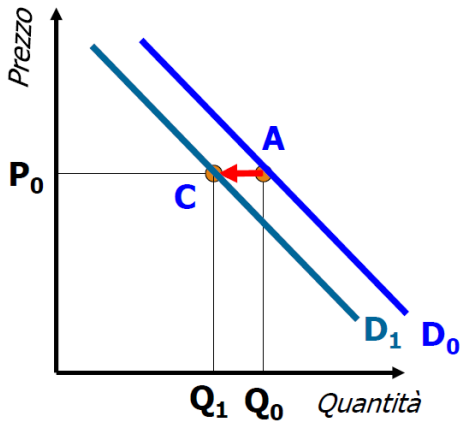
If the average income increases, the population has more resources to spend. At the same price, the population will therefore be able to afford to buy more printers. For example, for P0 the quantity demanded increases from Q0 to Q1. Graphically, this change is represented by a shift in the demand curve from D0 to D1, resulting in an increase in the quantity demanded for each price level.

c. the price of ink cartridges increases



Cartridges are a related good (complementary) to printers. An increase in the price of cartridges makes printers more expensive to use and discourages their purchase. For example, for P0 the quantity demanded decreases from Q0 to Q1. Graphically, this change is represented by a shift in the demand curve from D0 to D1, resulting in a decrease in the quantity demanded for each price level.

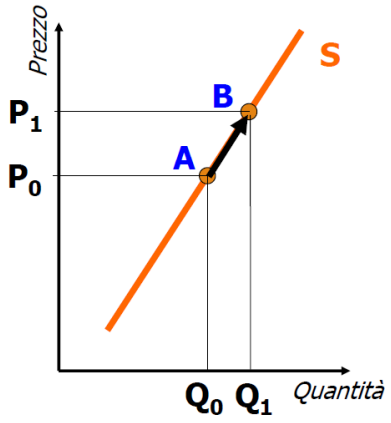
d. the tastes of consumers are changing: they prefer to keep their photographs and documents in digital format rather than in paper format



If the use of printers "goes out of fashion", regardless of the price, consumers will buy less (or even nothing) of them. For example, for P0 the quantity demanded could decrease from Q0 to Q1. As in the previous case (c), graphically this change is represented by a shift of the demand curve from D0 to D1, for which there is a decrease in the quantity demanded for each price level.

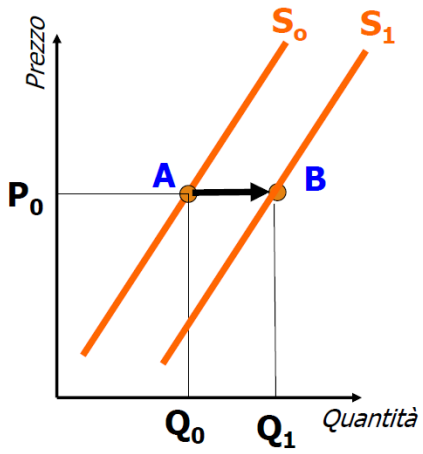
Exercise 2

a. the price of electric bicycles increases



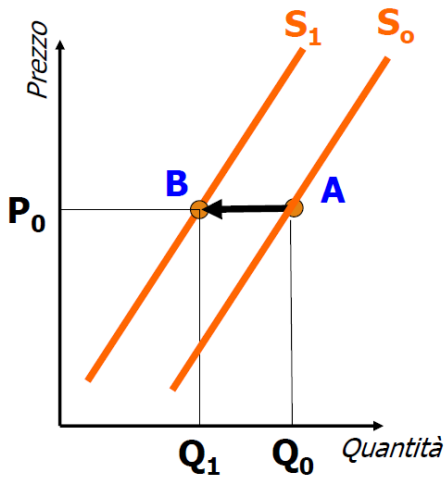
An increase in the price of electric bicycles from P0 to P1 (other supply conditions being equal) causes the reaction of the producers of that market, which attracted by the best profit opportunities, will produce electric bicycles in greater quantities, passing from quantity Q0 to Q1. Graphically, this change is represented by a movement along the supply curve from A to B.

b. technological progress reduces the cost of producing electric batteries



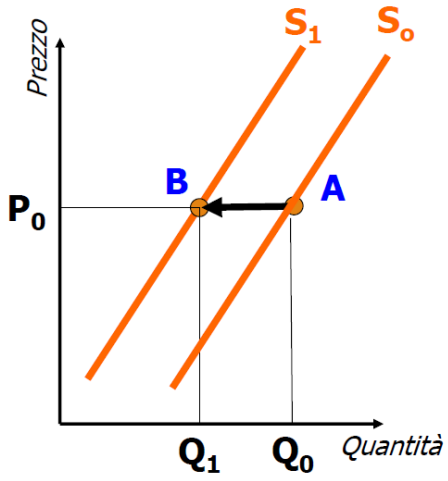
Technological progress reduces production costs so that companies are incentivized to produce a greater number of electric bicycles at the same price. For example, for P0 the quantity supplied increases from Q0 to Q1. Graphically, this change is represented by a shift in the supply curve from S0 to S1, so that there is an increase in the quantity offered for each price level.

c. the government removes subsidies for electric bicycle manufacturers



The removal of government subsidies is reflected in an increase in taxes paid by companies and therefore in an increase in production costs, so that companies are incentivized to produce fewer electric bicycles at the same price. For example, for P0 the quantity supplied decreases from Q0 to Q1. Graphically, this change is represented by a shift in the supply curve from S0 to S1, resulting in a decrease in the quantity supplied for each price level.

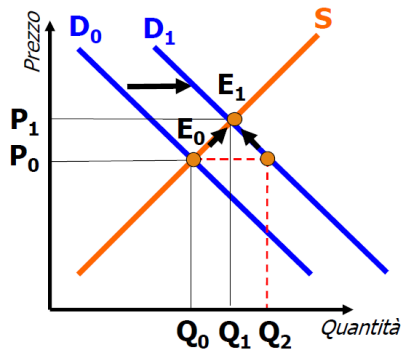
d. the price of electric scooters (monopattini) increases significantly



If the price of electric scooters (a good correlated to electric bicycles) increases, companies are encouraged by greater profit opportunities to direct part of their business to the production of scooters, reducing, at the same price, the production of electric bicycles. For example, for P0 the quantity supplied can decrease from Q0 to Q1. As in the previous case (c), graphically this change is represented by a shift of the supply curve from S0 to S1, for which there is a decrease in the quantity supplied for each price level.

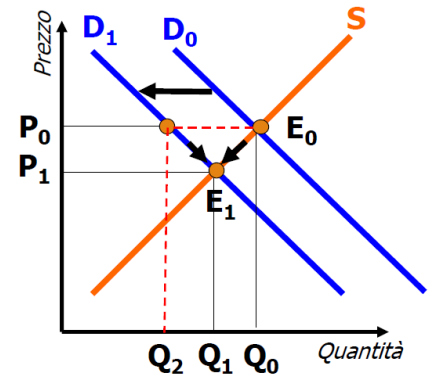
Exercise 3

a. climate change increases the need for cooling for consumers



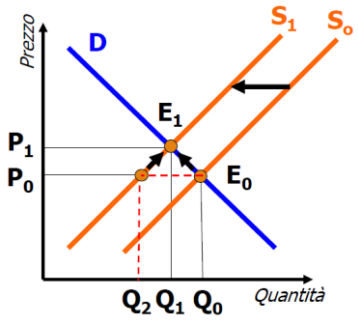
The need for cooling pushes consumers to buy larger quantities of air conditioners at the same price. For example, for P0 the quantity demanded increases from Q0 to Q2. Graphically, this change is represented by a shift in the demand curve from D0 to D1, resulting in an increase in the quantity demanded for each price level. The shortage that occurs at P0 (the difference between Q0 and Q2) generates pressure on the increase in the market price from P0 to P1, causing firms to increase the quantities produced from Q0 to Q1 and consumers to reduce the quantities demanded from Q2 to Q1. The market finds a new equilibrium point by moving from E0 to E1.

b. the government imposes a tax on those who have an air conditioner



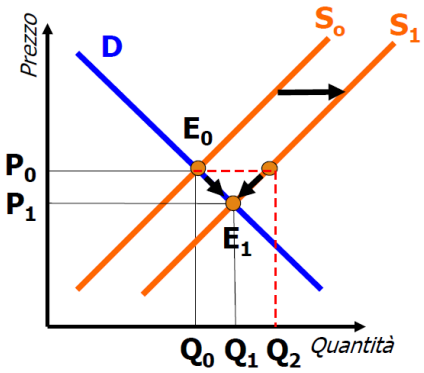
The tax makes to own an air conditioner more expensive and discourages its purchase at the same price. For example, for P0 the quantity demanded decreases from Q0 to Q2. Graphically, this change is represented by a shift in the demand curve from D0 to D1, resulting in a reduction in the quantity demanded for each price level. The surplus that occurs at P0 (the difference between Q0 and Q2) generates pressure on the reduction of the market price from P0 to P1, causing firms to reduce the quantities produced from Q0 to Q1 and consumers to reduce the quantities demanded from Q2 to Q1. The market finds a new equilibrium point by moving from E0 to E1.

c. the price of copper necessary for the production of air conditioners increases



The increase in the price of copper is reflected in an increase in production costs, so companies are encouraged to produce fewer air conditioners at the same price. For example, for P0 the quantity supplied decreases from Q0 to Q2. Graphically, this change is represented by a shift in the supply curve from S0 to S1, resulting in a decrease in the quantity offered for each price level. The shortage that occurs at P0 (the difference between Q0 and Q2) generates pressure on the increase in the market price from P0 to P1, causing firms to increase the quantities produced from Q2 to Q1 and consumers to reduce the quantities demanded from Q0 to Q1. The market finds a new equilibrium point by moving from E0 to E1.

d. the introduction of robotic assembly systems for air conditioners reduces production costs



The introduction of robotic assembly systems for air conditioners reduces production costs so that companies are encouraged to produce a greater number of air conditioners at the same price. For example, for P0 the quantity supplied increases from Q0 to Q2. Graphically, this change is represented by a shift in the supply curve from S0 to S1, so that there is an increase in the quantity offered for each price level. The surplus that occurs at P0 (the difference between Q0 and Q2) generates pressure on the reduction of the market price from P0 to P1, causing firms to reduce the quantities produced from Q2 to Q1 and consumers to increase the quantities demanded from Q0 to Q1. The market finds a new equilibrium point by moving from E0 to E1.