The University of Nottingham

School of Economics

Economics Tutor Nottingham

Supply and Demand – An Introduction

Lecture 3

Overview

- Last lecture: Introduction to (micro-) economics.
- Now look at one of the most important tools of microeconomics: supply-and-demand analysis.
  - Factors determining supply and demand
  - Movements along and shifts of demand and supply curves
  - Market equilibrium
  - Numerical examples

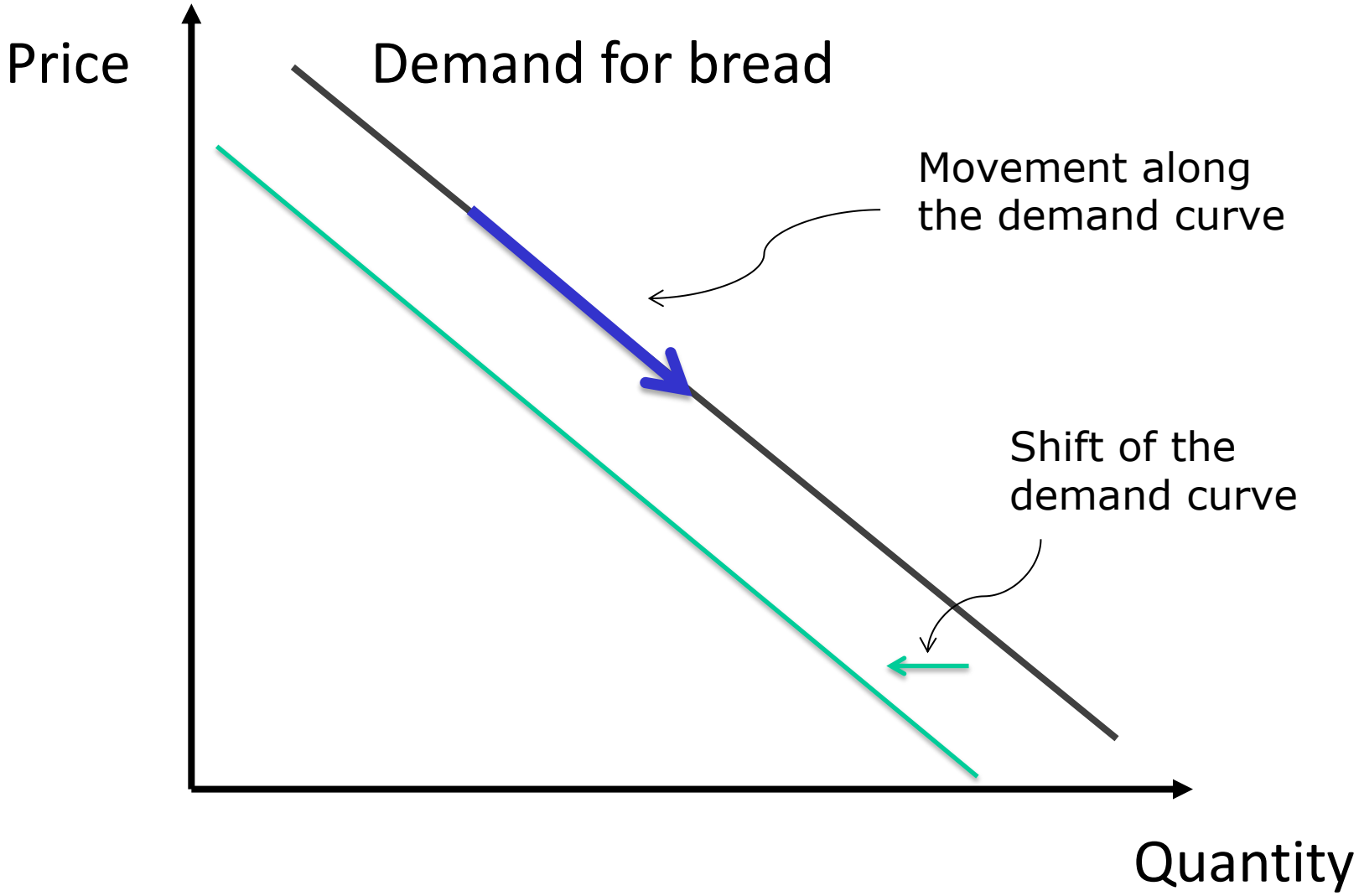
Supply and Demand – An Introduction

- In a market economy, prices are key to determine the allocation of resources.
  - Other mechanisms (central planning) no longer considered viable.
- Much of microeconomics is concerned with how prices are determined within a market (‘price theory’).
- The supply-and-demand model is the most important tool for this.
- Here: a quick introduction to supply-and-demand analysis.
- Rest of the course:
  - Understand where demand and supply come from.
  - Explore the limits of the basic supply-and-demand model.

Demand Curves

- The supply-and-demand model states that prices and quantities are determined by supply and demand.
- Demand for a good (say, bread) depends on
  - Price
  - Prices of related goods (croissants, butter)
  - Income (positive or negative influence?)
  - Other factors (information, tastes, government regulation …)
- The supply-and-demand model focuses on a good's price, holding all other factors constant.
  - A '***ceteris paribus***' assumption.
  - ***Exogenous*** vs ***endogenous*** variables.
  - Yields a 'demand schedule' or 'demand curve'.

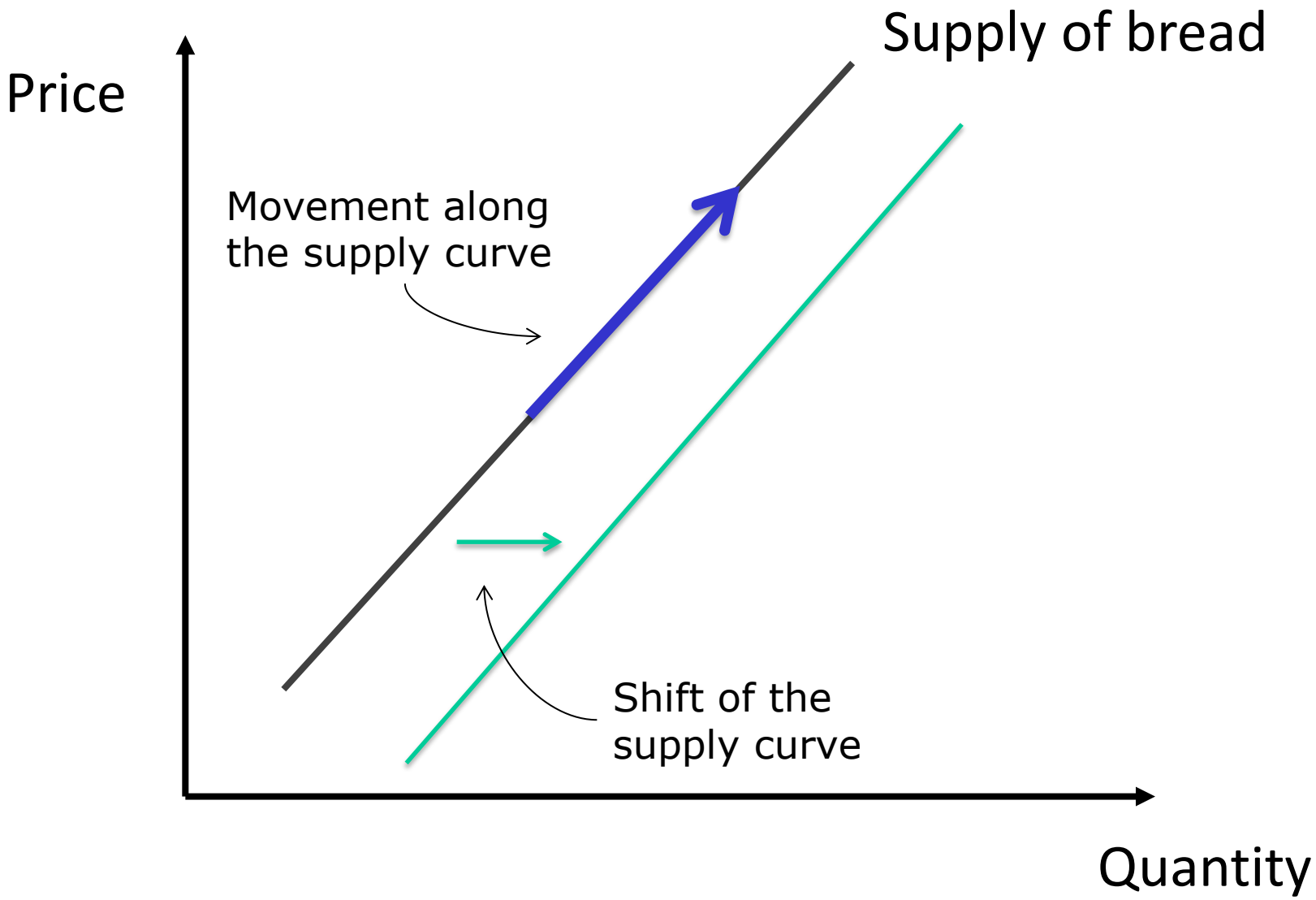
Demand Curves



Supply Curves

- Supply of a good (bread) depends on
  - Price
  - Prices of inputs (labour, flour …)
  - Conditions of production (e.g., technology)
  - Other factors (e.g., government regulation)
- Again focus on the good's price

Supply Curves



Demand and Supply – MC Exercise

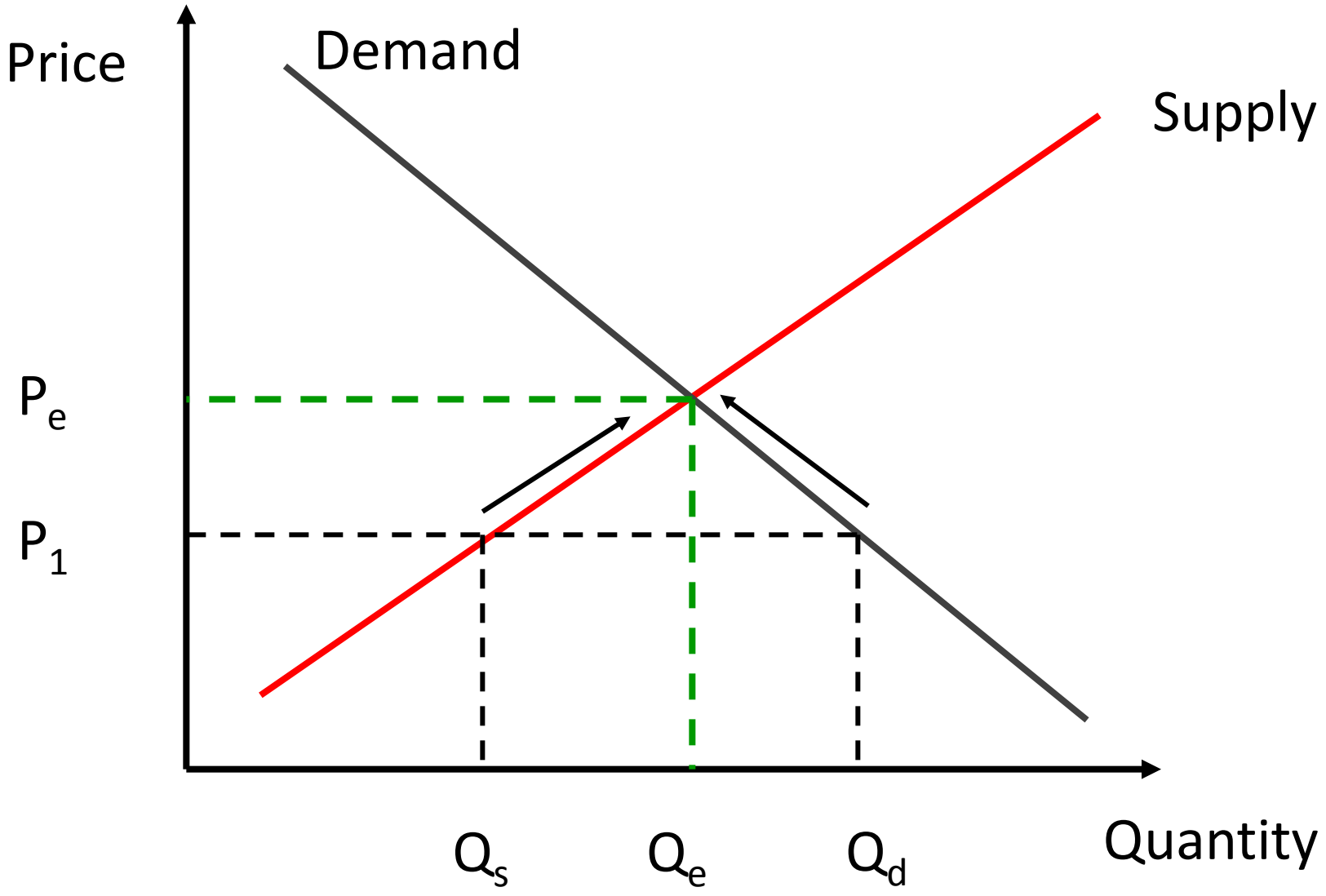
Consider the market for bread in the UK. Which of the following changes will **not** be associated with a shift of the demand or supply curves?

A. An increase in the price of bread leads to a decrease in the quantity of bread demanded.
B. The price of raspberry jam falls, leading to an increase in bread consumption.
C. The UK Government introduces stricter hygiene standards for bread production.
D. Lower import tariffs induce more foreign companies to export bread to the UK.
E. Both answers A) and D) are correct.

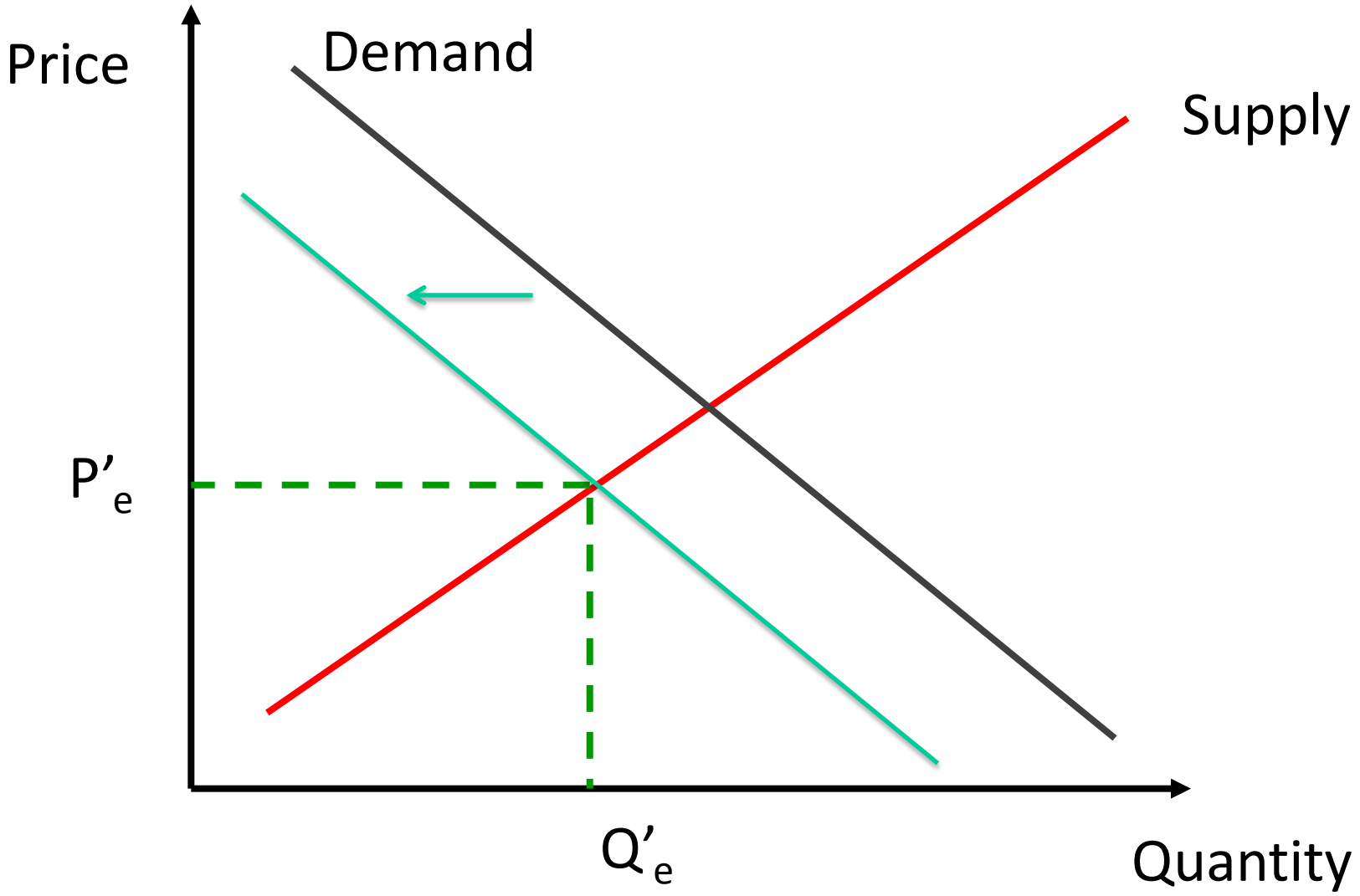
Equilibrium

- Intersection of demand and supply determines the ***equilibrium*** price P_e and quantity Q_e.
  - What happens if we are below P_e ('excess demand')?
  - What happens if we are above P_e ('excess supply')?
  - What happens if something changes?
    - The price of butter goes up.
    - 'Comparative statics' analysis.
- Central role of prices
  - Prices convey information.
  - Prices ration scarce resources.
  - Prices determine incomes.

Equilibrium



Equilibrium



Comparative Statics – MC Exercise

Suppose that it is observed that the price of a commodity rises and that the quantity sold also rises. From this we can deduce:

A. that the demand curve has shifted to the right, but we cannot deduce whether or not the supply curve has shifted.
B. that the demand curve has shifted to the left, but we cannot deduce whether or not the supply curve has shifted.
C. that the supply curve has shifted to the right, but we cannot deduce whether or not the demand curve has shifted.
D. that the supply curve has shifted to the left, but we cannot deduce whether or not the demand curve has shifted.
E. nothing. Either curve could have shifted either way depending on which way the other shifted.

Numerical Examples

- A numerical example: the market for processed pork in Canada (Moscini and Meilke, 1992)
- Demand:

$$Q = 171 - 20p + 20p_b + 3p_c + 2Y$$

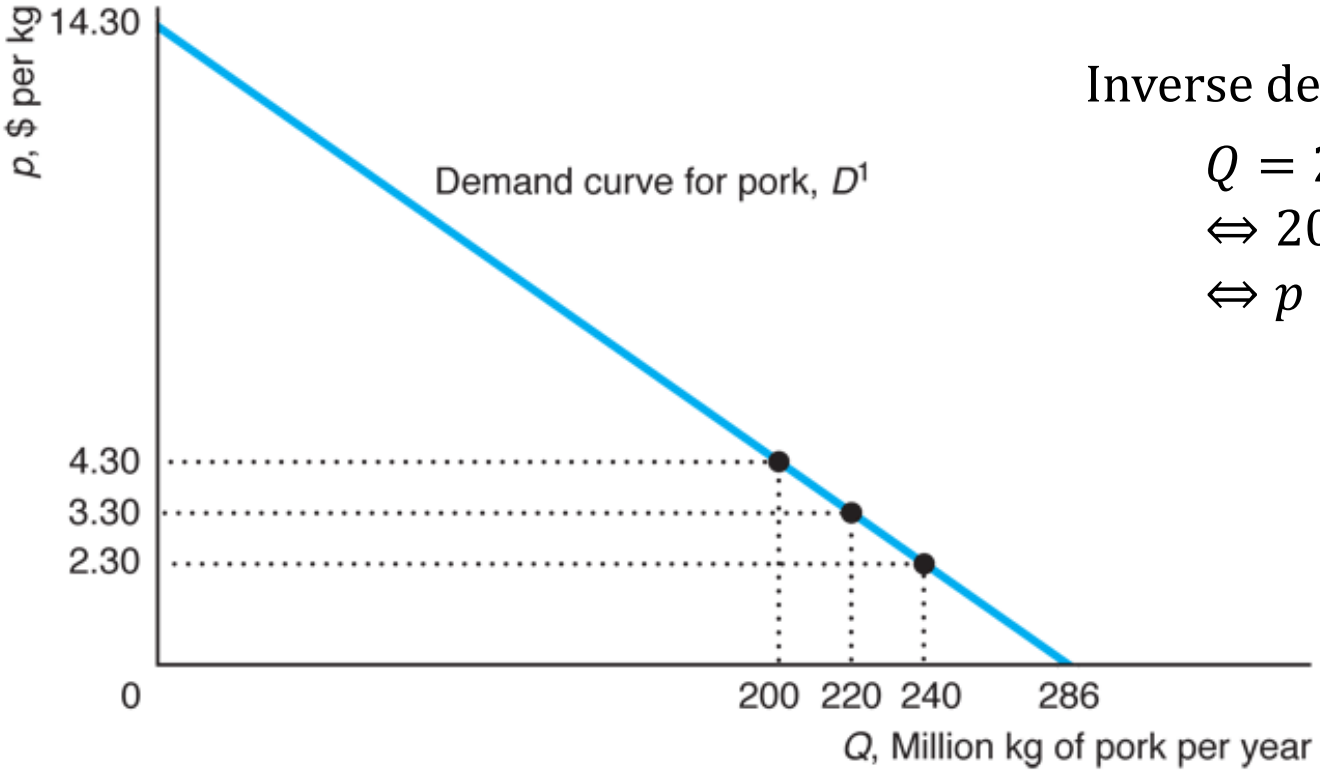
  - Q_d = quantity of processed pork demanded (million kg per year)
  - p = price of processed pork (in Canadian dollars per kg)
  - p_b = price of beef, a substitute good (in CND$ per kg)
  - p_c = price of chicken, another substitute (in CND$ per kg)
  - Y = consumers' income (in CND$ per year)
- Hold everything but price of processed pork constant:
  - p_b = \$4/kg, p_c = \$3.33/kg, Y = \$12.5 thousand

Numerical Examples

Demand: $Q = 171 - 20p + 20p_b + 3p_c + 2Y$

$= 171 - 20p + (20 \times 4) + \left(3 \times 3\frac{1}{3}\right) + (2 \times 12.5)$

$= 286 - 20p$



Inverse demand:

$Q = 286 - 20p$

$\Leftrightarrow 20p = 286 - Q$

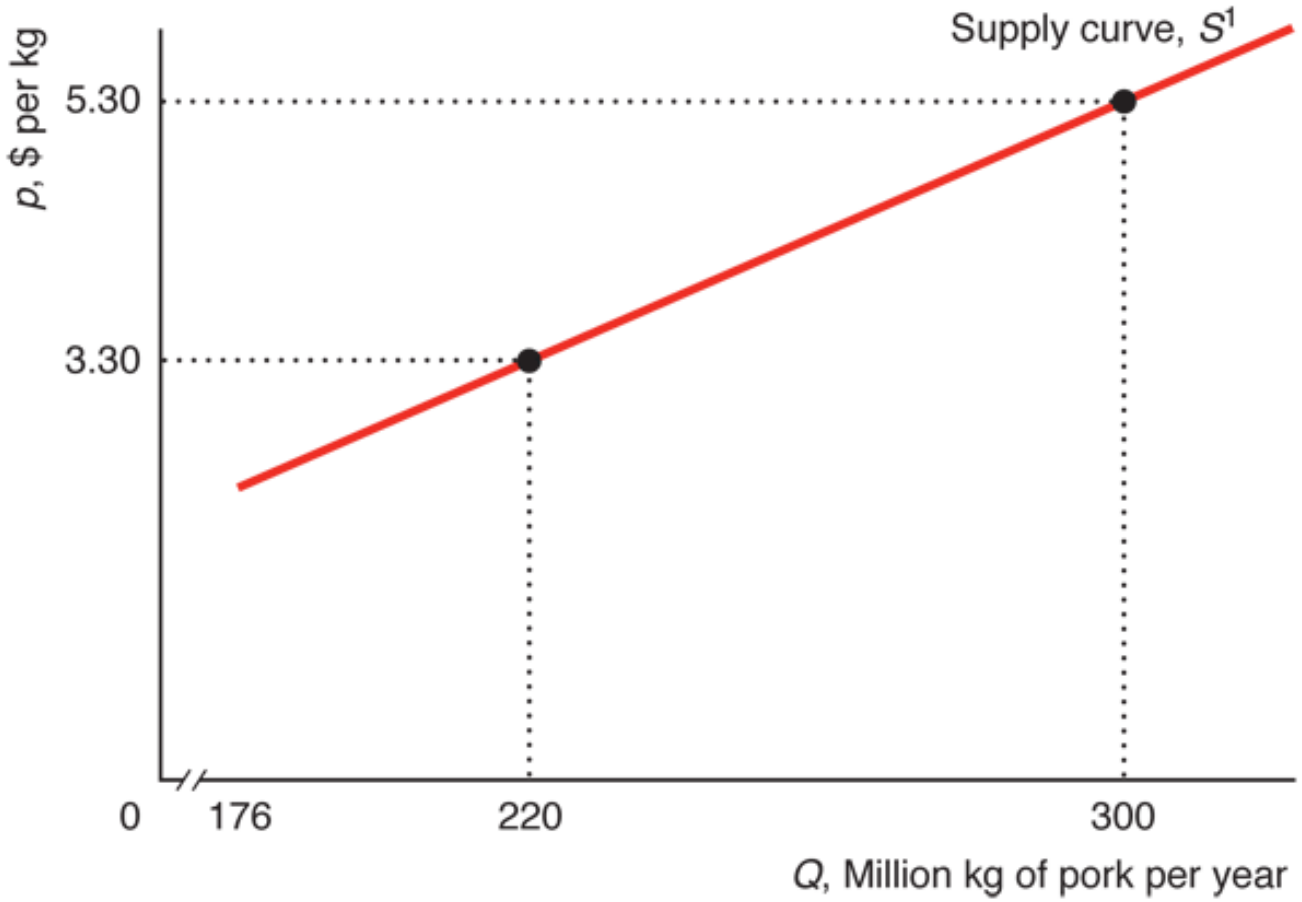
$\Leftrightarrow p = 14.3 - 0.05Q$

Numerical Examples

- Supply: $Q = 178 + 40p - 60p_h$
  - Q_s = quantity of pork supplied (million kg per year)
  - p = price of pork (in Canadian dollars per kg)
  - p_h = price of hogs, an input (in Canadian dollars per kg)
- Hold everything but price of processed pork constant:
  - p_h = \$1.50/kg

➡ $Q = 88 + 40p$ or $p = -2.2 + 0.025Q$

Numerical Examples



Numerical Examples

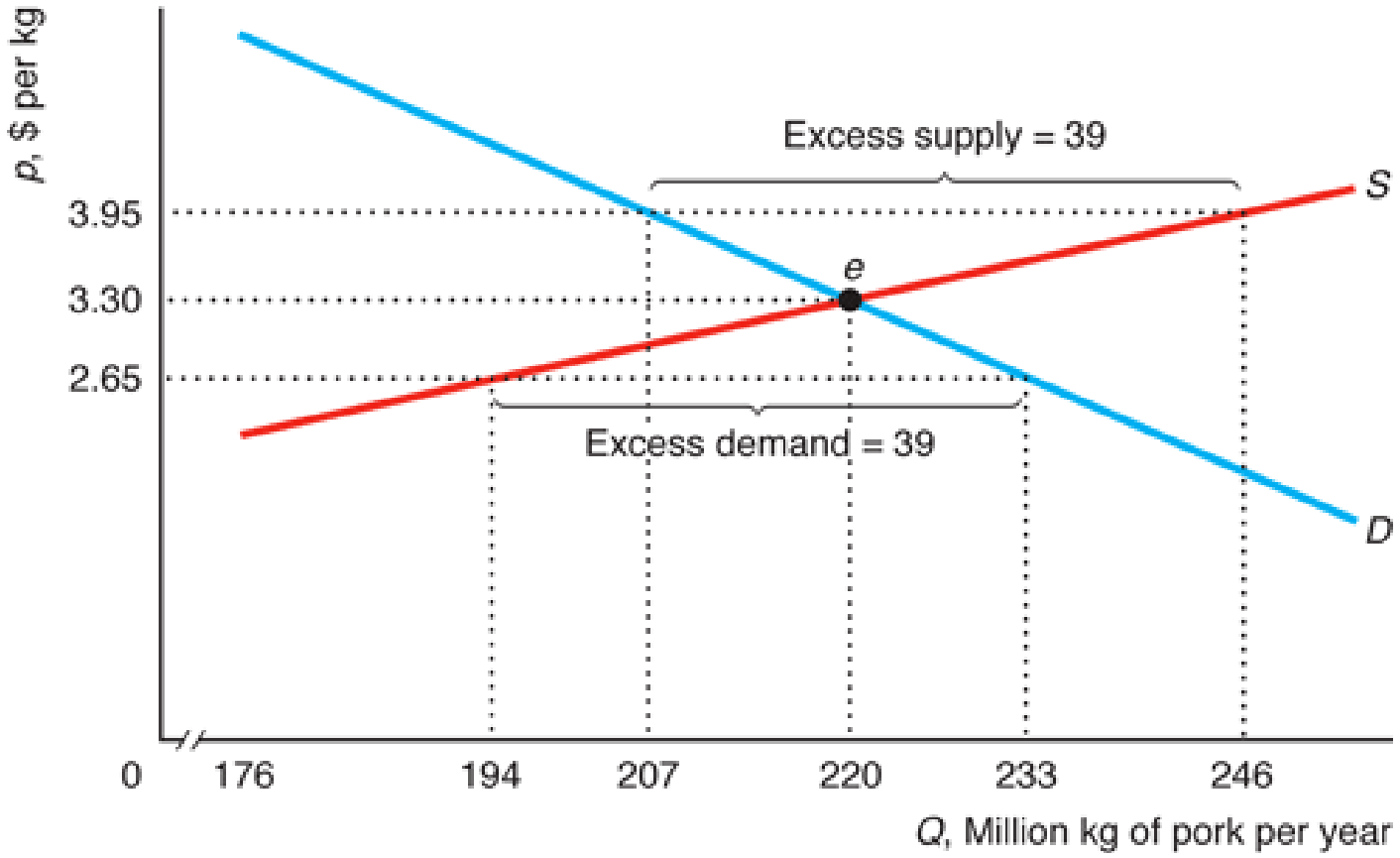
- Equilibrium is at the intersection of demand and supply
- Given $Q_d = 286 - 20p$ and $Q_s = 88 + 40p$, find p such that $Q_d = Q_s$:

$$286 - 20p = 88 + 40p \;\rightarrow\; p = \$3.30$$

- Insert solution back into demand or supply equation:

$$Q_d = 286 - 20 \times 3.3 = 220 = 88 + 40 \times 3.3 = Q_S$$

Numerical Examples



Numerical Examples

What will the new equilibrium price and quantity be if the price of hogs increases to $1.75/kg?

A) P* = $3.30 and Q* = 220.

B) P* = $1.80 and Q* = 250.

C) P* = $10.65 and Q* = 73.

D) P* = $3.55 and Q* = 215.

E) None of the above solutions is correct.

Supply and Demand – Outlook

- Is this all there is to economics? Not quite …
- Don't know yet where supply and demand curves come from or what determines their shape.
- The basic supply-and-demand model is only appropriate when markets are 'perfectly competitive'
  - There are a large number of buyers and sellers.
  - All firms produce identical products.
  - All market participants have full information about prices and product characteristics.
  - Transaction costs are negligible.
  - Firms can easily enter and exit the market.

Supply and Demand – Outlook

- Sections 2-4 of the lecture will look at perfectly competitive markets in more detail:
  - How do the choices of households generate demand curves?
  - How do firms' choices generate supply curves?
  - Analysis of perfectly competitive markets.
- Sections 5-6 look at situations where we don't have perfect competition:
  - Imperfect competition (monopolies, oligopolies).
  - Market failures (imperfect information, externalities, public goods).

Summary & Learning Outcomes

- Supply-and-demand analysis is the most important tool for analysing how prices determine the allocation of resources.
- The supply-and-demand model focuses on a good's price, holding all other factors constant.
- Intersection of demand and supply determines the equilibrium price and quantity.
- Comparative statics analysis describes changes to the equilibrium.
- The basic supply-and-demand model is only appropriate when markets are 'perfectly competitive'

Summary & Learning Outcomes

- Understand the factors influencing demand and supply.
- Be able to distinguish movements along from shifts of demand and supply curves.
- Know how to use demand and supply diagrams.
  - Derive the equilibrium graphically and algebraically.
  - Be able to do simple comparative statics analysis.
- Understand the limits of demand and supply analysis.
- Understand the relevant technical terms: ceteris paribus, exogenous vs endogenous variables, comparative statics.

Reading

- Morgan, Katz and Rosen: Chapter 1.3
- Perloff: Chapters 2.1-2.3, chapter 2.4 (pages 45-46)