UNIVERSITY BUSINESS • EXERCISE SHEET

3.2 Demand, supply and equilibrium

Name: _____ Class: _____ Date: _____ **Total: 23 marks**

KEY WORDS demand • supply • equilibrium

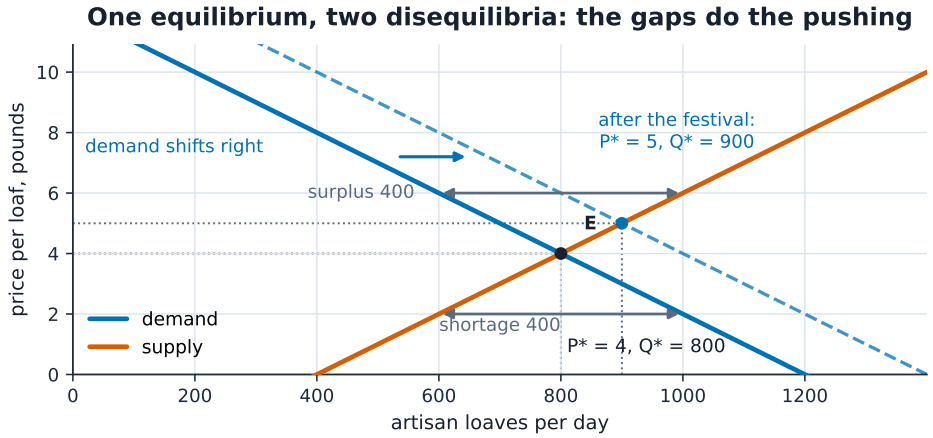
Objective

Solve a market equilibrium from linear demand and supply; measure shortage and surplus; run comparative statics in both directions and both at once; classify events as movements or shifts.

1 Key knowledge and worked examples

■ **Two curves, one crossing**

Demand and **supply** are whole relationships; **quantity demanded** and **quantity supplied** are points on them. The loaf's own price slides along a curve; anything else shifts it. **Equilibrium** solves $Q_d(P) = Q_s(P)$.



One equilibrium, two disequilibria: the gaps do the pushing

■ **Worked example. The bread market, twice**

Base: $1200 - 100P = 400 + 100P$ gives $P^* = £4$, $Q^* = 800$ ✓. Festival incomes: demand $1400 - 100P$ gives £5 and 900 – price and quantity rose together, the demand-shift signature ✓. Cheaper flour: supply $600 + 100P$ gives £3 and 900 – quantity up, price down, the supply-shift signature ✓.

2 Practice

The coffee-cart market on the high street has daily demand $Q_d = 900 - 50P$ and supply $Q_s = 100 + 50P$ (P in £ per cup).

2.1 Solve for the equilibrium price and quantity. Then measure the shortage at a price of £5. [4]

2.2 A pay rise across the city shifts demand to $Q_d = 1000 - 50P$. Find the new equilibrium and state the direction signature that identifies a demand shift. [4]

2.3 Bean prices fall and supply becomes $Q_s = 200 + 50P$. Find the new equilibrium and state its signature. [4]

2.4 Both changes arrive in the same week. Find the equilibrium and explain, in one line, why the price returned to its old level. [3]

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2.5 Classify each event as (i) movement along a curve, (ii) demand shift, (iii) supply shift: (a) the cup price falls to £6 and carts sell more; (b) a latte trend sweeps the city; (c) three new carts open; (d) the rent each cart pays rises; (e) the price of tea (a substitute) falls. [5]

2.6 At the base equilibrium a commentator says "carts are greedy: the price should be £5, not £8". Using the shortage you computed in question 2.1, explain in two lines what a price ceiling at £5 would do. [3]

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Solutions

2.1

- $900 - 50P = 100 + 50P$ gives $800 = 100P$.
- $P^* = £8$, $Q^* = 500$ cups.
- At £5: $Q_d = 650$, $Q_s = 350$.
- **Shortage of 300 cups.**

2.2

- $1000 - 50P = 100 + 50P$.
- $P^* = £9$, $Q^* = 550$.
- Price AND quantity rose together.
- The signature of a demand shift along an upward supply.

2.3

- $900 - 50P = 200 + 50P$.
- $P^* = £7$, $Q^* = 550$.
- Quantity rose but the price FELL.
- The supply-shift signature.

2.4

- $1000 - 50P = 200 + 50P$ gives $P^* = £8$, $Q^* = 600$.
- The two shifts push the price in opposite directions by equal amounts ($\pm£1$ here), so they cancel.
- The quantity gains add.

2.5

- (a) i – a price change moves along the curves.
- (b) ii – tastes shift demand.
- (c) iii – more sellers shift supply.
- (d) iii – an input price shifts supply.
- (e) ii – a cheaper substitute shifts demand for coffee left.

2.6

- A ceiling at £5 holds the price below the £8 equilibrium.
- Buyers plan 650 while carts offer 350: the 300-cup shortage turns into queues and rationing instead of a higher price.
- The equilibrium price did not fall from greed; it sits where the plans agree.

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