Module 1 Review: Markets, Demand and Supply

Lecture notes · Principles of Economics I · Module 1: Markets, demand and supply · Lesson 5 (module review and assessment)

Learning objectives

O1	Analyse a market event: decide which curve shifts, in which direction, and find the new equilibrium (Lesson 1).
O2	Use the price elasticity of demand and the total revenue test to predict what happens to sellers' revenue (Lesson 2).
O3	Measure the gains and losses of buyers and sellers with consumer, producer and total surplus (Lesson 3).
O4	Evaluate a price ceiling or floor using the whole toolkit, separating evidence from value judgements (Lesson 4).

Prerequisites: All of Module 1: Lessons 1-4 (supply and demand; elasticity; consumer and producer surplus; price ceilings and floors).

Contents: 1. A four-step method for any market event · 2. Step 1: the storm shifts supply · 3. Step 2: elasticity and sellers' revenue · 4. Step 3: who is worse off · 5. Step 4: should the council impose a ceiling? · 6. Key ideas of Module 1 in one place · 7. Five common mistakes · 8. Preparing for the module test · Worked examples · Summary · References

1. A four-step method for any market event

Module 1 gives you four tools. Used in order, they turn almost any news story about a market into clear, checkable answers.

Step 1 (Lesson 1): which curve shifts, which way, and what is the new equilibrium? Step 2 (Lesson 2): how strongly do quantities respond, and what happens to revenue? Step 3 (Lesson 3): who gains and who loses, measured with consumer and producer surplus? Step 4 (Lesson 4): if a government controls the price, does the control bind, and what does it cost?

The rest of these notes works through the storm case from the video, then collects the module's key definitions, its most common mistakes and advice for the module test.

2. Step 1: the storm shifts supply

A storm destroys fruit on the trees. It does not change how much buyers want mangoes at each price, so demand does not shift. It reduces how much farmers can bring to market at every price, so supply shifts to the left.

Before: Qd = 1100 - 200P and Qs = -100 + 200P give $3 and 500 kg. After: Qs' = -300 + 200P (200 kg less at every price). At the old price of $3 buyers want 500 kg but only 300 kg are offered: a shortage of 200 kg, which pushes the price up.

New equilibrium: 1100 - 200P = -300 + 200P gives P = $3.50, Q = 400 kg.

Language matters: supply decreased (the curve moved); demand did not change; the quantity demanded fell (a movement along the demand curve).

3. Step 2: elasticity and sellers' revenue

Midpoint method: %change in quantity = 100 / 450 = 22.2%; %change in price = 0.50 / 3.25 = 15.4%. Elasticity = 1.44, greater than 1, so demand is elastic over this range.

Total revenue test: with elastic demand, a higher price reduces revenue. Revenue falls from 3 x 500 = $1,500 to 3.50 x 400 = $1,400 a day.

This is why 'a bad harvest is good for farmers' is not a general rule. It holds when demand is inelastic over the relevant range (Lesson 2's bumper-harvest puzzle) and fails when demand is elastic, as here.

4. Step 3: who is worse off

Before: consumer surplus = 1/2 x 500 x (5.50 - 3) = $625; producer surplus = 1/2 x 500 x (3 - 0.50) = $625; total $1,250 a day.

After: the new supply curve meets the price axis at $1.50. Consumer surplus = 1/2 x 400 x (5.50 - 3.50) = $400; producer surplus = 1/2 x 400 x (3.50 - 1.50) = $400; total $800.

Buyers lose $225 and sellers lose $225 a day. This fall is NOT a deadweight loss: supplying mangoes has become more costly, and given those new costs the market still trades exactly the quantity that maximises total surplus. The economy is poorer; the market has not failed.

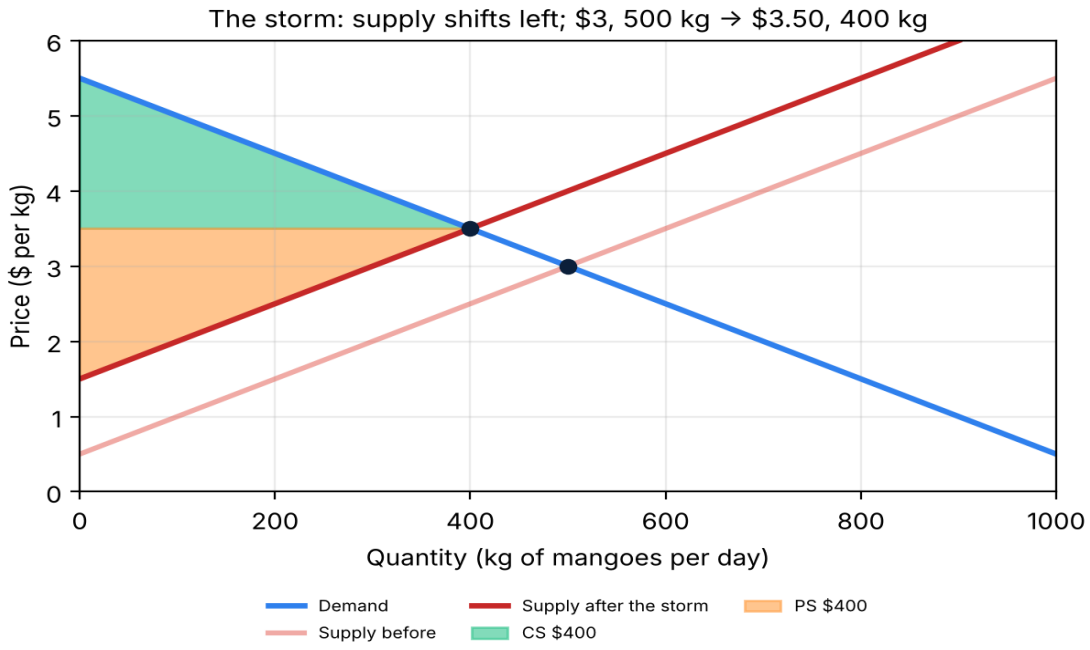


Figure 1. The storm shifts supply to the left; consumer (green) and producer (orange) surplus after the storm.

5. Step 4: should the council impose a ceiling?

A ceiling at the old price, $3, is below the new equilibrium price of $3.50, so it binds. At $3: Qd = 500, Qs' = 300, shortage 200 kg; the short side (sellers) decides, so 300 kg are traded.

At 300 kg the demand curve is at $4 and the new supply curve at $3. Consumer surplus = 225 + 300 = $525 (up $125); producer surplus = $225 (down $175); deadweight loss $50 a day, at least.

The model cannot say whether helping buyers who get mangoes is worth the cost to sellers, the lost surplus and the unmet demand: that involves value judgements. It can list the alternatives to compare (for example direct help for low-income households, or support for farmers to replant) and put numbers on each option's trade-offs.

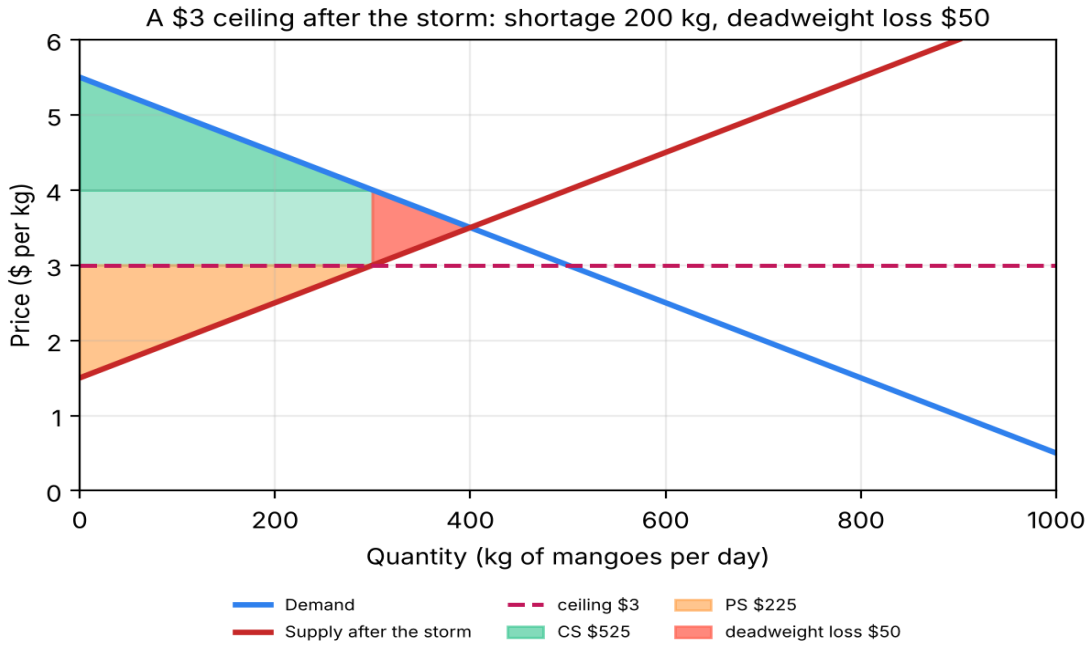


Figure 2. A $3 ceiling after the storm: shortage, the new division of surplus and the deadweight loss.

6. Key ideas of Module 1 in one place

Market: buyers and sellers who trade a good. Demand: how much buyers want at each price (law of demand). Supply: how much sellers offer at each price (law of supply). Equilibrium: the price at which quantity demanded equals quantity supplied.

Shift vs movement: a change in a non-price factor shifts a curve; a change in the good's own price moves along it. Shortage: quantity demanded exceeds quantity supplied (price tends to rise). Surplus (Lesson 1 meaning): quantity supplied exceeds quantity demanded (price tends to fall).

Price elasticity of demand: % change in quantity demanded / % change in price (midpoint method). Elastic > 1, inelastic < 1, unit elastic = 1. Total revenue test: with inelastic demand, price and revenue move together; with elastic demand, in opposite directions.

Consumer surplus: willingness to pay minus price; producer surplus: price minus lowest acceptable price; total surplus is largest at a competitive equilibrium (efficiency, not

fairness).

Price ceiling: legal maximum, binds below equilibrium, shortage. Price floor: legal minimum, binds above equilibrium, surplus. Quantity traded = the short side. Deadweight loss: surplus that disappears because trades worth making do not happen.

7. Five common mistakes

1. Saying 'demand fell' when the price rose: the quantity demanded fell; demand (the curve) did not move.

2. Assuming a higher price always means more revenue: it depends on elasticity.

3. Mixing the two meanings of 'surplus': unsold goods versus gains from trade.

4. Using the long side of the market under a price control: the quantity traded is always the smaller of quantity demanded and quantity supplied.

5. Treating deadweight loss as money someone receives: it is value that is never created.

8. Preparing for the module test

The module test in the workbook has three sections. Section A: short questions (1-2 marks) drawn from each lesson's question bank. Section B: applied problems (4 marks each), one from each lesson. Section C: one extended answer (8 marks). The marking scheme is in the solutions manual.

Show your working: for every calculation write the formula in words, substitute the numbers, then state the answer with units. Draw and label a diagram whenever a question involves a shift, an area or a price control.

Suggested time: about 60 minutes. Attempt the whole test before looking at the solutions, then use the lesson numbers on each item to revise what you missed.

Going deeper: why the storm's loss is not a deadweight loss

A deadweight loss arises when the quantity traded differs from the quantity at which the value to buyers of the last unit equals its cost to sellers. After the storm the cost of supplying each kilogram is higher (the supply curve is higher), and the market quantity, 400 kg, is exactly where demand meets the new supply curve.

Total surplus falls because the economy has lost productive capacity, not because the market has misallocated resources. Policy can redistribute the loss, or help restore capacity, but a price control cannot recover it; it can only add a deadweight loss on top.

Going deeper: who bears a supply shock depends on elasticity

In the 200 kg storm, buyers lose $225 of consumer surplus and sellers lose $225 of producer surplus: an equal split, because the demand and supply curves have equally steep slopes here.

If demand were steeper (less elastic), the price would rise more and buyers would bear more of the loss; if demand were flatter, sellers would bear more. This links Lessons 2 and 3 and prepares later work on who bears the burden of a tax.

A one-page concept map

Event -> which curve? (non-price factor of buyers: demand; of sellers: supply) -> new equilibrium (direction of price and quantity) -> size of the response (elasticity) -> revenue (total revenue test) -> welfare (consumer, producer and total surplus) -> policy (binding test, short side, transfer, deadweight loss) -> judgement (evidence and values).

Use this chain as a checklist whenever you analyse a market in the news.

Worked examples

Worked example 1: a smaller storm (100 kg)

Supply falls to Qs = -200 + 200P. Find the new equilibrium, the elasticity of demand between the two prices, and the change in revenue.

Step 1. 1100 - 200P = -200 + 200P gives P = $3.25, Q = 450 kg.

Step 2. Midpoint elasticity: (50/475) / (0.25/3.125) = 1.32: elastic.

Step 3. Revenue $1,500 -> $1,462.50: it falls, as the total revenue test predicts for elastic demand.

Worked example 2: a demand increase and a storm together

Demand rises to Qd' = 1300 - 200P while the storm cuts supply to Qs' = -300 + 200P. Find the new equilibrium and explain the result.

Step 1. 1300 - 200P = -300 + 200P gives P = $4, Q = 500 kg.

Step 2. Both shocks raise the price, so it rises a lot.

Step 3. The demand increase raises the quantity and the supply decrease lowers it; here they cancel exactly, so the quantity is unchanged. In general, with two shocks, one variable's direction is certain and the other depends on their sizes (Lesson 1).

Worked example 3: a floor of $4 after the storm

After the storm (Qs' = -300 + 200P), farmers ask for a price floor of $4. Does it bind? Find the surplus of mangoes and the deadweight loss.

Step 1. $4 is above the new equilibrium price $3.50, so it binds.

Step 2. Qs' = 500, Qd = 300: surplus 200 kg; sold 300 kg (short side: buyers).

Step 3. At 300 kg: demand height $4, supply height $3. DWL = 1/2 x 100 x 1 = $50 a day.

Step 4. Consumer surplus $225, producer surplus $525 (from $400 and $400).

Worked example 4: a gentler ceiling

After the storm, the council considers a ceiling of $3.25 instead of $3. Compare it with the $3 ceiling.

Step 1. At $3.25: Qd = 450, Qs' = 350, shortage 100 kg, traded 350 kg.

Step 2. At 350 kg: demand height $3.75, supply height $3.25; DWL = 1/2 x 50 x 0.50 = $12.50.

Step 3. Compared with the $3 ceiling (shortage 200 kg, DWL $50), the gentler ceiling helps buyers less but loses much less: the closer a ceiling is to the equilibrium price, the smaller its side effects.

Summary

• Four steps for any market event: which curve shifts; how strongly quantities respond; who gains and loses; what a price control would do.

• Storm case: supply shifts left; $3.50, 400 kg; elasticity 1.44 (elastic), so revenue falls from $1,500 to $1,400.

• Total surplus falls from $1,250 to $800; this is a loss of capacity, not a deadweight loss.

• A $3 ceiling binds: shortage 200 kg, buyers +$125, sellers -$175, deadweight loss $50.

• The model quantifies trade-offs; deciding between them requires evidence and value judgements.

• Module test: 13 items from the Lesson 1-4 banks, 35 marks.

References

References: KN-UGR-ECO-C01-M01-T05-L01
Module 1 review: no new content beyond Lessons 1-4; see their references.md files.
- OpenStax, *Principles of Economics* 3e (2023), ch. 3 "Demand and Supply" and ch. 5 "Elasticity". Licence CC BY-NC-SA. https://openstax.org/details/books/principles-economics-3e
- N. Gregory Mankiw, *Principles of Economics*, chs. 4-7. Cited only; no text or figures are reproduced.
ILLUSTRATIVE market (stated in narration): Qd = 1100 - 200P, Qs = -100 + 200P; after the storm Qs' = -300 + 200P. All numbers are
computed in scenes.py and asserted in facts.py. The module test in the workbook is drawn from the L01-L04 question banks (see resources.py).
Numbers in these notes are computed from the same equations as the video and checked automatically. The mango market and the storm are illustrative. The module test is drawn from the Lesson 1-4 question banks.