

Scarcity, choice and opportunity cost

Build a clear method for comparing feasible alternatives, separating sunk costs from future consequences, and thinking at the margin. All scenarios are illustrative.

Written walkthrough. Work through each explanation alongside the PDF slides. The lesson page also includes a captioned video with a generic synthetic narrator. It is not a recording of Craig Wright.

Fictional examples teach reasoning rather than describe a real business. No external academic credit is awarded.

Learning objectives

1. Identify scarcity and feasible alternatives without equating scarcity with poverty.
2. Calculate budget trade-offs and opportunity costs with consistent units.
3. Separate sunk, explicit and implicit costs without double counting.
4. Apply marginal reasoning while checking assumptions, uncertainty and values.

Slide 1: Choices begin with scarcity

Scarcity means that available time, resources and knowledge cannot satisfy every possible use. It does not mean that everything is rare or that everyone is poor. Economics studies choices under these limits. Throughout this lesson, every person, price and situation is illustrative. Start with this question: what must be given up?

Walkthrough

Imagine a completely free afternoon. Even without a cash expense, you cannot spend the same hour sleeping, visiting a friend and learning a skill in different places. Time is scarce because its uses compete. Wealth can relax some constraints, but it does not remove all of them. Economics begins by identifying the decision-maker, the available alternatives and the limits on those alternatives. This course pays particular attention to individual agency and voluntary arrangements. That interest does not settle every factual question: we must still examine evidence, assumptions and the consequences of different choices.

Slide 2: A feasible choice is an available choice

A feasible set contains the options that a person can actually choose, given relevant constraints. A budget, opening hours, physical capacity and existing commitments can all matter. Preferences rank feasible alternatives; they do not make an unavailable alternative available. Separate “I would like it” from “I can choose it now”.

Walkthrough

Suppose a learner wants to take three evening classes. Enough money is not sufficient if all three meet at the same time. Equally, an available timetable is not enough if a required prerequisite is missing. Write down each relevant constraint before recommending a choice. A constraint is binding at a particular choice when that choice uses the entire stated limit; a non-binding constraint has slack. Some models simplify this to money alone. That can be useful, provided we remember that the model deliberately leaves out other limits rather than proving that they do not exist.

Slide 3: Worked example: draw a budget boundary

An illustrative weekly budget is £36. Books cost £9 each and lunches cost £6 each. Let B be books and L be lunches: $9B + 6L$ must be no more than 36. All books gives 4 books; all lunches gives 6 lunches. Two books and three lunches exactly exhaust the budget.

Walkthrough

Step one is to name the quantities and their units: books and lunches per week. Step two is to multiply each quantity by its price. Two books cost 2 times £9, or £18; three lunches cost 3 times £6, also £18. Step three adds those expenditures: £36, so that bundle is feasible and lies on the budget boundary. One book and three lunches cost £27, leaving £9 unspent. Four books and one lunch cost £42, so that bundle is infeasible under the stated budget. We are holding prices fixed and allowing no borrowing.

Slide 4: Worked example: calculate the trade-off

On that budget boundary, one additional book uses £9 that could buy 1.5 lunches. Its opportunity cost is therefore 1.5 lunches when lunch spending is the displaced alternative. With indivisible items, swapping two books for three lunches gives an exact feasible exchange. A price ratio describes the boundary's trade-off, not the learner's preferences.

Walkthrough

Divide the book price by the lunch price: 9 divided by 6 equals 1.5 lunches per book. Check the units: pounds per book divided by pounds per lunch becomes lunches per book. Because half a lunch may not be purchasable, compare whole bundles as well. Starting from two books and three lunches, moving to four books and zero lunches gains two books and sacrifices three lunches. The ratio is still three divided by two. Whether that change is desirable depends on the learner's priorities. Feasibility and desirability are separate questions.

Slide 5: Opportunity cost is the best forgone alternative

Opportunity cost is the value of the next-best feasible alternative sacrificed by a choice. Do not add together mutually exclusive alternatives. If the same hour could earn £18 tutoring or £12 gardening, choosing a third activity for that hour does not forgo £30. It forgoes whichever available alternative the person ranks highest.

Walkthrough

List the alternatives before calculating anything. Tutoring and gardening cannot both occupy the same hour, so adding their earnings invents an opportunity that never existed. Non-cash alternatives also count. Someone might value resting above either paid activity. We cannot discover that ranking from wages alone. When we express benefits in pounds, we are using a stated or estimated money equivalent for this particular person, not claiming that every experience has a publicly observable price. Opportunity costs may differ between people facing the same shop prices because their alternatives and priorities differ.

Slide 6: Keep cash and economic cost separate

An explicit cost is a payment. An implicit cost is the value of an owned resource used instead of its next-best alternative. An afternoon project can use materials and unpaid time. Count each sacrifice once. Include an implicit time cost only when the comparison has not already accounted for the forgone activity.

Walkthrough

Suppose making a shelf costs £14 for materials and takes an afternoon that could otherwise earn £40 after relevant work expenses. Under these illustrative assumptions, the economic cost is £54. Calling the labour unpaid does not make its opportunity cost zero. However, if you compare the project's net outcome directly with the £40 work alternative, do not subtract £40 again on the other side. Consistent comparisons can use total outcomes or incremental differences. Both methods should give the same ranking when they include the same alternatives and avoid counting a sacrifice twice.

Slide 7: Sunk costs belong to the past

A sunk cost has already been incurred and cannot be recovered through the current decision. It can explain how someone reached a situation, but it does not change the relative future consequences of available options. A refundable deposit is not fully sunk. Resale value, cancellation charges and future commitments need separate checks.

Walkthrough

The practical test is not simply whether money has already changed hands. Ask whether choosing differently now would recover any of it. A non-refundable ticket has a sunk purchase price. A ticket that can be resold has a current opportunity cost: using it sacrifices its net resale value. An unpaid cancellation charge may also be an avoidable future cost. Decisions should reflect those differences. Ignoring a genuinely sunk cost does not excuse the original decision or prevent learning from it; it means refusing to let an irreversible past loss distort the present comparison.

Slide 8: Worked example: continue or leave?

An illustrative concert ticket cost £18 and cannot be refunded or resold. Attending now brings enjoyment valued at £25 and requires £8 of travel. Staying home brings enjoyment valued at £14 with no extra cost. Compare future net values: attending gives £17; staying gives £14. Attending has a £3 advantage.

Walkthrough

Step one removes the £18 ticket payment from both current alternatives because neither decision can recover it. Step two calculates attending's future net value: £25 minus £8 equals £17. Step three compares that with the £14 home alternative. The difference is £3 in favour of attending, given these stated valuations. If illness reduced concert enjoyment to £19, attending would instead give £11 and staying home would be preferable. The ticket price remains unchanged in both cases. The example demonstrates a decision rule; it does not prescribe how much anyone should enjoy music or rest.

Slide 9: Think at the margin

Marginal means additional: the benefit or cost of one more unit, hour or step. For a divisible activity, expand while the next increment's benefit exceeds its opportunity cost. For discrete options, compare actual available bundles. A large total benefit does not imply that every additional unit is worth its cost.

Walkthrough

A first glass of water may be extremely valuable, while a tenth glass in the same sitting may not be welcome. Total benefit and the benefit of the next glass answer different questions. Marginal reasoning focuses on the choice that remains open now. It is especially useful when deciding how much of an activity to do. The simple rule needs care when choices come in bundles, require a minimum scale, or affect future opportunities. In those cases, compare complete feasible plans rather than mechanically applying a one-unit rule that ignores connections between decisions.

Slide 10: Worked example: choose the next session

Four optional practice sessions have additional benefits valued at £31, £22, £12 and £5, in that order. Each session has a £15 opportunity cost. Net increments are £16, £7, minus £3 and minus £10. Taking the first two gives a total net benefit of £23. The third reduces that total.

Walkthrough

First calculate each extra session separately: 31 minus 15 is 16; 22 minus 15 is 7; 12 minus 15 is negative 3; and 5 minus 15 is negative 10. Then build feasible totals. Zero sessions gives zero; one gives 16; two give 23; three give 20; and four give 10. Two sessions is best among these options. This conclusion assumes sessions are taken in order, the stated benefits include relevant consequences, and no separate package discount applies. An earlier non-refundable enrolment fee would not change this current choice if it cannot be recovered.

Slide 11: Rules need their assumptions

A useful model states what is held fixed and what is omitted. The session example assumes diminishing additional benefits, constant additional cost and no hidden interaction. Real learning may have thresholds: a final session might unlock a qualification. When increments depend on one another, evaluate the relevant package before applying a marginal rule.

Walkthrough

Imagine that completing all four sessions produces a certificate worth an additional £30 to the learner. That changes the fourth session's consequences and therefore changes the original calculation. The earlier conclusion was not mathematically wrong; its assumptions no longer describe the choice. This is why good economic reasoning records the conditions behind a result. A model can make a complex question manageable, but simplicity is a tool rather than proof of universal validity. Ask which omitted feature could reverse the ranking, then investigate that feature instead of adding detail that cannot affect the decision.

Slide 12: Uncertainty changes what we compare

Many outcomes are uncertain. Expected value weights each possible outcome by its probability, but people may also care about risk, timing and worst cases. Gathering information has a cost and can improve a decision. More information is worthwhile only when its expected usefulness exceeds its relevant cost, including delay.

Walkthrough

Suppose an activity has a one-half chance of delivering a benefit valued at £40 and a one-half chance of delivering zero. Its expected benefit is £20, calculated as one-half times 40 plus one-half times zero. That does not mean everyone would exchange a certain £20 for this gamble. Preferences over risk and the ability to absorb a bad outcome matter. Estimates of probabilities can also be poor. Treat expected value as one transparent component of a decision, state where the probabilities came from, and avoid presenting an uncertain forecast as a guaranteed outcome.

Slide 13: Analysis and values answer different questions

A positive claim concerns what happens or could happen under specified conditions. A normative claim concerns what ought to happen or which values should guide action. Respect for individual choice is a normative commitment. Whether a particular rule expands feasible choices is an empirical or model-based question that still needs evidence.

Walkthrough

A libertarian approach typically gives substantial weight to individual liberty, property rights and voluntary cooperation. We can examine that position openly while distinguishing it from a prediction. For example, saying that adults should generally direct their own lives is a value judgement. Saying that a new restriction raises a particular cost is a causal claim requiring a mechanism and evidence. A person's choice reveals something about their ranking among perceived options, but it does not establish perfect information, freedom from pressure, or effects on other people. Keep those questions visible rather than assuming them away.

Slide 14: A reusable decision checklist

Name the decision and the person making it. Identify feasible alternatives and relevant constraints. Compare future benefits and opportunity costs, counting each sacrifice once. Ignore only costs that are genuinely sunk. Examine the next increment or complete package. State uncertainty, affected people and the values behind your final recommendation.

Walkthrough

Use the checklist on a modest decision before applying it to a complicated policy debate. A clear comparison of two available study plans can teach more than a confident claim about an entire economy with no stated assumptions. Notice where arithmetic ends and judgement begins. The calculations organise implications of the information supplied; they cannot create missing preferences or reliable probabilities. In the exercises, numerical and choice responses can be checked automatically. Short written explanations are explicitly ungraded reflection. Use them to state an assumption or limitation, not to guess a hidden keyword that supposedly proves understanding.

Questions students ask

If a ticket was expensive, should I use it to avoid wasting money?

Only if using it is your best current option. An unrecoverable payment cannot be changed now. Check refunds or resale first, then compare the future consequences of attending and doing something else.

Does choosing something prove that it is good for everyone?

No. A choice may indicate the chooser's ranking among perceived options. It does not by itself establish informed consent, absence of mistakes, effects on others, or a shared moral judgement.

Does economics say I should maximise money?

No. Money can make some comparisons easier, but rest, relationships, learning and other aims can enter a person's preferences. The method asks for a coherent comparison, not a particular life goal.

Your exercises

Submit your answers on the lesson page at craigwright.net/learning. Numerical and choice checks receive server feedback. Written responses are saved ungraded. No assessment answer key appears in this guide.

1. A new budget boundary

Illustrative case: you have £84 for kits costing £12 each and meals costing £7 each. No borrowing or other spending is allowed. Give each all-in maximum and the budget-boundary opportunity cost of one kit in meals. Use the price ratio for the last answer, even though purchases are whole items. Round the opportunity cost to two decimal places.

Maximum kits (kits)

Maximum meals (meals)

Opportunity cost of one kit (meals per kit)

2. Reconsider an outing

Illustrative case: an outing ticket cost £27 and cannot be refunded or resold. From now, attending brings enjoyment valued at £24 and costs £9 in travel. Staying home brings enjoyment valued at £12 and costs nothing extra. Calculate attending's future net value and its advantage over staying home. Then select the better current option under these assumptions.

Future net value of attending (£)

Attending minus staying home (£)

Better current option

1. Attend
2. Stay home
3. Equal net values

3. How many practice blocks?

Illustrative case: four optional practice blocks must be taken in order. Their additional benefits are valued at £28, £21, £13 and £7. Each costs £16 including time. There are no package benefits or discounts. Choose the number of blocks that maximises total net benefit and calculate that net benefit relative to taking none.

Best number of blocks (blocks)

Total net benefit (£)

Ungraded reflection: describe one changed assumption that could alter your choice.

4. Find the next-best option

Illustrative case: one afternoon allows exactly one activity. Tutoring has net value £45, repairing your furniture has net value £38, and resting has value £30, all according to your own stated valuations and including relevant costs. If you choose tutoring, what is its opportunity cost and its advantage over the next-best alternative?

Opportunity cost of tutoring (£)

Advantage over the next-best alternative (£)

Ungraded reflection: why should the two forgone alternatives not be added together?