ECON 100A - Section Notes
September 9, 2025
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Reading Response

- The first Reading Response is due Thursday, September 11, at 11:59 pm. We will be working on this today
- You were asked to read Thaler, Richard. 2016. "Behavioral Economics: Past, Present, and Future." American Economic Review, 106 (7): 1577-1600. Pdf linked in the course pack.
- Some example of leading discussion points for you to answer in groups:
  - Thaler argues that concepts like loss aversion, overconfidence, and present bias are already in The Wealth of Nations and The Theory of Moral Sentiments. Do you think it matters that these insights were present at the very founding of economics? Should we interpret behavioral economics as a "new paradigm" or simply a return to forgotten roots?
  - Friedman defended neoclassical models by saying agents behave "as if" they optimize. Kahneman & Tversky showed biases are systematic, not random noise. Can you think of real-world examples where the "as if" assumption clearly breaks down?
  - Thaler's term captures framing, defaults, temptation, endowment effect, etc. Pick one everyday SIF (say: free shipping thresholds, gym memberships, or auto-renew subscriptions). Why does it matter economically even though classical theory says it shouldn't? Could you design an experiment to prove its effect?

Budget Line & Tangency Method for Utility Maximization

Do not panic if you do not understand all of what follows straight away and prefer to start with our practice problems this is totally fine. This is in general math terms what you will be doing in many, many problems so if you understand it well then you won't have any issues with the practice and exam problems on these topics. I am writing this here to you as a reference ; you can come back to it whenever you want / feel ready ; no rush :)

Simplified set-up for this class: Two goods $x_1, x_2 \geq 0$ with prices $p_1, p_2 > 0$ and income $m > 0$. Preferences represented by a utility function $u :^2_+ \to$, assumed *monotone* (more is better) and *strictly quasi-concave* (indifference curves are convex).

The *budget set* at (p_1, p_2, m) is

$$B(p, m) = \{(x_1, x_2) \in^2_+ :\ p_1 x_1 + p_2 x_2 \leq m\}.$$

Its boundary,

$$p_1x_1 + p_2x_2 = m,$$

is the *budget line*.
Intercepts: $(m/p_1, 0)$ and $(0, m/p_2)$. With x_1 on the horizontal axis, the slope is $-\frac{p_1}{p_2}$.

Some useful comparative statics:

- If m increases (prices fixed), the budget line shifts out in parallel.
- If p_1 increases (holding p_2, m fixed), the line pivots inward around $(0, m/p_2)$; if p_1 decreases, it pivots outward.

Now let me do a little methodo point on **utility maximization with indifference curves**.
Problem: $\max\{u(x_1, x_2) : \ p_1x_1 + p_2x_2 \le m, \ x_1, x_2 \ge 0\}$.
Monotonicity implies any optimum (if interiorly feasible) lies on the budget line. With differentiable u, define the *marginal rate of substitution* (MRS) of good 1 for 2:

$$\mathrm{MRS}_{12}(x) = \frac{\partial u/\partial x_1}{\partial u/\partial x_2},$$

so that the slope of the indifference curve at x is $-\mathrm{MRS}_{12}(x)$.
Suppose u is differentiable, monotone, and strictly quasi-concave.

1. **Interior optimum:** If $x^\star \gg 0$, then

$$\mathrm{MRS}_{12}(x^\star) = \frac{p_1}{p_2} \quad \text{and} \quad p_1x_1^\star + p_2x_2^\star = m.$$

   Equivalently, with the Lagrangian $\mathcal{L} = u(x_1, x_2) + \lambda\,(m - p_1x_1 - p_2x_2)$,

$$\frac{\partial u}{\partial x_1}(x^\star) = \lambda p_1, \qquad \frac{\partial u}{\partial x_2}(x^\star) = \lambda p_2.$$

2. **Corner optimum:** If no interior point satisfies $\mathrm{MRS}_{12} = p_1/p_2$, the optimum lies on a *corner* of the budget set. A useful test:

$$\begin{cases} \mathrm{MRS}_{12}(x) < \dfrac{p_1}{p_2} \text{ (IC flatter than budget)} \ \Rightarrow \ \text{spend all on good 2 (possibly } x_1^\star = 0), \\ \mathrm{MRS}_{12}(x) > \dfrac{p_1}{p_2} \text{ (IC steeper than budget)} \ \Rightarrow \ \text{spend all on good 1 (possibly } x_2^\star = 0). \end{cases}$$

Strict quasi-concavity guarantees the tangency solution (when it exists) is the unique global maximum.
How will you solve on a graph?

1. Draw the budget line $p_1x_1 + p_2x_2 = m$; note its slope $-p_1/p_2$ and intercepts.
2. Sketch an indifference map (higher curves = higher utility).

3. **Interior check:** Look for the highest indifference curve that still touches the budget line. At the best feasible point $x^\star$, the IC is tangent to the budget: slope of IC $= -\text{MRS}_{12}(x^\star) =$ slope of budget $= -\dfrac{p_1}{p_2}$.

4. **Corner check:** If every feasible IC at contact is either strictly steeper or strictly flatter than the budget, the optimum is where the budget line meets an axis (all income on one good).

5. **(Optional) Algebraic route:** Solve $\text{MRS}_{12}(x) = p_1/p_2$ for x_2 as a function of x_1 (or vice versa), then impose $p_1x_1 + p_2x_2 = m$ to obtain $x^\star$. If the implied $x^\star$ is not in ${}^2_{++}$, compare utility at corners.

Practice

Assume a standard, triangular budget set. For each of these two descriptions, use a diagram and a short explanation to describe a situation in which:

- There is a single point of tangency between the budget line and one of the consumer's indifference curves, but that point is NOT the consumer's utility-maximizing choice.
- The consumer's utility-maximizing choice is on the budget line but is NOT a point of tangency between the budget line and an indifference curve.

There are two goods in the world, 'games of darts' (x1) and 'games of pinball' (x2). Jim's preferences over the two goods can be represented by the utility function u(x1; x2) = x2. He is at an arcade with $10 to spend and faces the budget set illustrated on the board

- Add to the diagram a few of Jim's indifference curves, including the one on which his optimal choice lies. What is Jim's marginal rate of substitution, how did you fnd it, and how would you explain what it means in simple terms?
- Ed went to a dierent arcade. He had $20 to spend. He faced exactly the same budget set and made exactly the same optimal choice as Jim. How, if at all, do the prices of each good dier between the two arcades? Does Ed have the same preferences as Jim? Explain both of your answers.