Errata file for
"Advanced Microeconomic Theory: An Intuitive Approach with Examples," MIT Press, First Reprint, 2023

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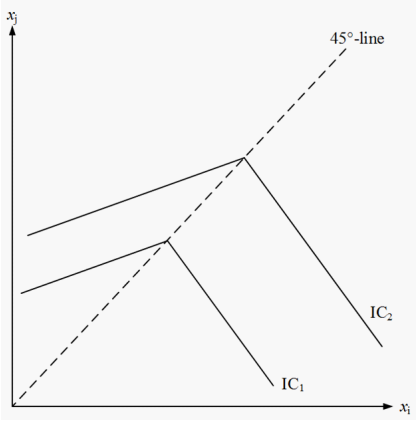
1. **Chapter 1 - Preferences and utility**

- Page 7, Example 1.2 (third line). The sentence "An individual states that he prefers alternative x to y if $x \geq y-1$ $(x+1 \geq y)$,.." until "...becomes indifferent between them." should read as follows:
  - "An individual states that he is indifferent between alternatives x and y when they are very close together, specifically, when the absolute value of their difference satisfies $|x-y|<1$. This means that $-1<x-y<1$ or, after rearranging, $y-1<x<y+1$. Therefore, when alternative x satisfies both $x>y-1$ and $x<y+1$, the individual is indifferent between x and y. Intuitively, when alternatives are relatively similar (i.e., close to $x=y$), the individual cannot tell them apart. However, he strictly prefers x to y when $x \geq y+1$, meaning that alternative x is at least one unit larger than y. In contrast, he strictly prefers alternative y to x when $x \leq y-1$ (or $x+1 \leq y$), which indicates that alternative y is at least one unit larger than x.
    Therefore, this preference relation satisfies completeness since, for a given bundle y, another bundle x lies in the indifferent set (when x satisfies both $x>y-1$ and $x<y+1$), in the upper contour set (when $x \geq y+1$), or in the lower contour set (when $x \leq y-1$).
    Transitivity, however, does not hold, which we can easily prove with the following counterexample. Consider alternatives 1.5, 0.8, and 0.3, where"
- Page 9. The second displayed equation should read $B \succ_{1,3} L \succ_{1,2} P \succ_{2,3} B$.
- Page 14. The balls in figures 1.1 to 1.3 should have dashed lines to indicate open balls, not closed balls.
- Page 15. The ball in figure 1.4 should have dashed lines to indicate an open ball, not a closed ball.
- Page 16,
  - Last sentence immediately before subsection 1.4.2 should read "Therefore, *IND* is the intersection of *UCS* and *LCS*, that is, $IND(x) = UCS(x) \cap LCS(x)$. Figure 1.5 depicts examples of *IND*, *UCS*, and *LCS* sets where bundle x lies in $\mathbb{R}^2_+$."
  - Figure 1.5. The label of the lower contour set should read $\left\{y \in \mathbb{R}^2_+ : x \succsim y\right\}$.
- Page 17, Figure 1.6, the label at the left bottom corner, $x << z$, should read $z << x$.
- Page 18. Definition of Convexity 2 (top of the page). Its last line should read "$UCS(x) = \{y \in \mathbb{R}^2_+ : y \succsim x\}$, is convex."
- Page 20. Figure 1.8. The linear combination between bundle x and y, at the top right-hand corner, should read $\alpha x + (1-\alpha)y$.

- Page 33, displayed equation before section 1.8 should start with $\|y - x\|$ to indicate the Cartesian product, instead of $y - x$.
- Page 39, last displayed equation should not have a negative sign on the right-hand side.
- Page 40. The first two displayed equations should not have negative signs anywhere.
- Page 48. Third paragraph, "where $n = \{0, 1, 2, ...\}$" should be replaced with "where $n = \{1, 2, ...\}$", deleting the zero.
- Page 53.
  - First paragraph, the end of line 6, should read "...solving for x_j yields $x_j = \frac{\overline{u}}{\beta_i} - \frac{1-\beta_i}{\beta_i} x_i$, but if $x_i < x_j$ we obtain $x_j = -\frac{\overline{u}}{\alpha_i} + \frac{1+\alpha_i}{\alpha_i} x_i$, thus giving rise to two segments in each indifference curve: one with slope $\frac{1+\alpha_i}{\alpha_i}$ above and another with slope $-\frac{1-\beta_i}{\beta_i}$ below the 45-degree line, where a kink exists at the 45-degree line for which $x_i = x_j$. In addition, note that..."
  - Figure 1.29 should be replaced with the following.



- Page 54. The second displayed equation should read:

$$u_i\left(x_i, \frac{x_i}{x_i + x_j}\right) = x_i - \alpha\left(\frac{x_i}{x_i + x_j} - \frac{1}{2}\right)^2$$

  could represent individual i's preferences in this context, where $\alpha_i \geq 0$ captures how much individual i cares about relative payoffs, as measured by ratio $\frac{x_i}{x_i + x_j}$."
- Page 71. Exercise 8, part (b) should read "$f(x) = au(x) - b\left[u(x)\right]^2$, where $a, b > 0$."
- Page 73.
  - Exercise 14. There should be $i = 1$ below the multiplication operator, rather than $i - 1$.
  - Exercise 16, third line should read "(a) local non-satiation,"
- Page 74. The list of references should add the following:
  - Dr. Seuss. 1961. *The Sneetches and other stories*, Random House. New York.
  - Laibson, D. 1997. Golden eggs and hyperbolic discounting. Quarterly Journal of Economics 112(2): 443-77.
  - O'Donaghue, T. and M. Rabin. 1999. Doing it now or later. American Economic Review 89(1): 103-24.
  - Nicholson, W., and C. Snyder. 2011. *Microeconomic Theory: Basic Principles and Extensions*. Boston: Cengage Publishing.
  - Klibanoff, P., M. Marinacci, and S. Mukerji. 2005. A smooth model of decision making under ambiguity. Econometrica 73(6): 1849-92.

2. **Chapter 2 - Demand Theory**

- Page 119, Second displayed equation. The last inequality should be replaced with $\geq$ sign, so it reads
$$\frac{\partial L}{\partial x_k} = p_k - \mu \frac{\partial u\left(x^*\right)}{\partial x_k} \geq 0$$
- Page 127, Figure 2.41. The horizontal axis should have w/p_1' in the last horizontal intercept, instead of w/p_1.
- Page 129.
  - Line 3 should read "...this property implies that all goods cannot be net complements in consumption (while they can still be all net substitutes). In particular..."
  - Line 6 should read "If all goods were net complements, all the off-diagonal terms would be negative.[1] In this case..."
- Page. 150, Example A2.3. The list of prices should change p_1 and p_2, so they read $p_1 = (1, 1, 1)$ and $p_2 = (2, 1, 1)$.
- Page 151, Example A2.4. In the list of prices, please change $p_2 = (2, 1, 1)$ so it reads $p_2 = (1, 2, 1)$.
- Page 154.
  - Exercise 2, second line should read "...utility function $u(x_1, x_2) = x_1^{\alpha} x_2^{1/2-\alpha}$ over two goods..."
  - Exercise 4, second line should read "...the price of good i, and..."
  - Exercise 4, part (b) should read $x_i(p_i, p_{-i}, w) = \frac{w}{p_i}\left[\alpha_i + \beta_i \log w_i + \sum_{j=1}^{K} \gamma_{ij} \log p_j\right]$
- Page 155.
  - Exercise 6. Second line should read "...and then the student needs to..."
  - Exercise 6. The table that now shows up at the bottom of the page should be centered, and larger. Now it has a smaller font than footnotes.
- Page 156. Exercise 9a should read $p_x = \$0.5$ instead of $p_y = \$1$.
- Page 157.
  - Exercise 9. Last two parts of the exercise (e and f) should be deleted since they ask students to find the CV and EV of a price decrease, which is the topic of chapter 3.
  - Exercise 10, part (b) should read "...that an inferior good does not need to..."
- Page 158. Exercise 12, first displayed equation, second term should read $x_2(p, w) = -\frac{p_1}{p_3}$, instead of $\frac{p_1}{p_3}$.
- Page 159.
  - Exercise 16. Replace wealth levels w_i with w in parts (a)-(c).
  - Exercise 18. The last sentence should read: "exactly a one percent increase in consumption (the income elasticity, $\varepsilon_{x_i,w}$ converges to one when the consumer's wealth level tends to infinity, i.e., $\lim_{w\to\infty} \varepsilon_{x_i,w} = 1$)."
- Page 161.
  - Exercise 26. The indirect utility function in the third line should read $v(p, w) = \left(p_1^{\alpha} p_2^{1-\alpha}\right)^{-1} w$, so there is a missing -1 in the exponent of the parenthesis.
  - Exercise 27. The end of the question should read "...must satisfy $\varepsilon_{h_i,p_i}\varepsilon_{h_j,p_j} \leq \varepsilon_{h_i,p_j}\varepsilon_{h_j,p_i}$. [*Hint*: Recall that the expenditure function $e(p, u)$ is concave in prices.]"

3. **Chapter 3 - Demand Theory-Applications**

- Page 168. Section 3.1.2. The third line after the displayed equation should read "Since $p_1^1 < p_1^0$, the CV of the price decrease..."

[1] Recall that, by the Compensated Law of Demand, self-price effects must be negative, implying that the diagonal terms in the Slutsky equation must be negative. When the negative self-price effect is so strong that compensates all other positive cross-price effects, we can still obtain $D_p h(p, u)p = 0$.

- Page 170. Figure 3.5. The vertical axis should have the initial price p_1^0 in the upper boundary of the shaded area, and the final price p_1^1 in the lower boundary.
- Page 199. In the list of first-order conditions (displayed equations at the top of the page), add "$\frac{\partial L}{\partial x} = \frac{1}{x} - \lambda p_x = 0$," so there are three displayed equations.
- Page 207. Line 5 (second paragraph) should read "...the level set can then be described as $p(w_i) = w_i/v$, thus becoming $p(w_i) = w_i/10$ when $v = 10$". Then, line 7 on the same paragraph should read "...a constant slope of 1/10".
- Page 212. Exercise 5. Part (a) should read "Find the Walrasian demand". Part (c), in the last line of the page, should read: "Find the AV, CV, and EV when the price of good 1 decreases from $p_1 = 2$ to $p_1' = 1$."
- Page 215. Exercise 12, second line should read "...preferences $u(x_1, x_2) = (x_1 x_2)^{0.5}$, where x_1..."

4. **Chapter 4 - Production Theory**

- Page 224.
  - The second displayed equation should read
$$\frac{dz_k}{dz_l} = -\frac{\frac{\partial f(\overline{z})}{\partial z_l}}{\frac{\partial f(\overline{z})}{\partial z_k}}$$
  - The third displayed equation should read
$$\frac{\frac{\partial f(\overline{z})}{\partial z_l}}{\frac{\partial f(\overline{z})}{\partial z_k}} \equiv MRTS_{l,k}\left(\overline{z}\right)$$
- Page 229, point 3, fifth line. Replace "bottom panels of figure 4.6" with "figures 4.6b and 4.6c".
- Page 236. Last paragraph, second line should read "...using isoquants. Figure 4.16a shows constant returns..."
- Page 238.
  - First line should read "...isoquant $q = 100$ to $q = 200$ units. Figure 4.16b shows that the same..."
  - Line 4. The sentence "Finally, the right-hand panel reflects that..." should read "Finally, figure 4.16b reflects that..."
- Page 239.
  - First displayed equation should read $f(tk, tl)$ in the denominator (second ratio).
  - Line 22 should read "...proportionally (of $2^{0.51} = 1.42$), while increasing..."
  - Line 24 should read "...proportionally (of $2^{1.24} = 2.36$), while increasing..."
- Page 240. Line 8 should read "...using a monotonically increasing transformation..."
- Page 248. Footnote 23 should read "...function $f(k, l) = [al^{(\sigma-1)/\sigma} + bk^{(\sigma-1)/\sigma}]^{\sigma/(\sigma-1)}$, where..."
- Page 251.
  - Line 9 should read "... that yield the same profits as $\pi_i(p)$ does."
  - Line 17 to 18 should read $\pi^0 = p_1 y_1 + p_2 y_2$.
- Page 256.
  - The sentence "which entails input demands" should be followed by
$$z_1(w, p) = \left(\frac{w_2^{\alpha} w_1^{1-\alpha}}{\alpha}\right)^{\frac{1}{2\alpha-1}} \quad \text{and}$$
$$z_2(w, p) = \frac{w_1}{w_2}\left(\frac{w_2^{\alpha} w_1^{1-\alpha}}{\alpha}\right)^{\frac{1}{2\alpha-1}}.$$
    Therefore, the vector..."

- Page 258. Footnote 32, line 5, should replace $\pi(\overline{p}) > \max\{\pi(p), \pi(p')\}$ with $\pi(\overline{p}) = \pi(\alpha p + (1-\alpha)p') \leq \alpha\pi(p) + (1-\alpha)\pi(p')$.
- Page 264. The last sentence of section 4.4 should read, "and hence $(p-p')\cdot(y'-y) > 0$."
- Page 278. Example 4.8. The first sentence of this example should read "Consider the Cobb-Douglas production function $f(z_1, z_2) = z_1^{\alpha} z_2^{\beta}$, where..."
- Page 282. Section 4.8. First line should read "...and satisfies free disposal, then the..."
- Page 287. Footnote 54 should read "Note that if the cross-partial derivative $\partial^2 c(q_j, q_{-j})/\partial q_j \partial q_i > 0$ $(= 0)$, the distance between the two upward sloping lines in figure 4.44 would increase in q_i (remain constant, respectively). If, instead, $\partial^2 c(q_j, q_{-j})/\partial q_j \partial q_i < 0$, the two upward sloping lines..."
- Page 293.
  - Footnote 59, first line should read "...in the example depicted in figure 4.47 and output..."
  - Footnote 60, second line should read "...in the bottom panel of figure 4.47 does not cross the..."
  - Footnote 61, fifth line should read "...it must be that such score is below your average."
- Page 294. In the displayed equations, all $c(q)$ should be replaced with $C(q)$, since total cost is denoted as $C(q)$ throughout the chapter.
- Page 296, line 18. The word "individual" is broken up in across two lines without a hyphen. Please add a hyphen.
- Page 299.
  - Proof. Third line should read "... such that $y' \geq y$ and $y' \neq y$. That is,..."
  - Proof. Sixth line should read "... since $p >> 0$, $y' \geq y$ and $y' \neq y$. But then..."
- Page 303, footnote 70 should read "...input prices are zero, as described in figure 4.52."
- Page 307.
  - Figure A4.3. The total cost function $C(q)$ is missing from panel (b).
  - Line 5 should read "the firm's costs in figure A4.4b are zero..."
- Page 309, second line should read "...and fixed costs as in case 5."
- Page 317, Exercise 5, second line should read "...constant returns to scale, that is, $\lambda f(z_1, z_2) = f(\lambda z_1, \lambda z_2)$ for any $\lambda > 0$. What is the relationship..."
- Page 318.
  - Exercise 8, First line should read "The profit function, $\pi(p)$, is defined as $\pi(p) = \max\{p \cdot y | y \in Y\}$ or alternatively as..."
  - Exercise 8, part (a), should read "...the profit function, $\pi(p)$, is convex in prices."
- Page 319.
  - Exercise 12. The displayed equation at the top of the page should read

$$q = f(z_1, z_2) = \frac{\theta}{1 + z_1^{-\theta} z_2^{-\varepsilon}}$$

  - Exercise 13, line 5 should read "...is more efficient than plant 1 since plant 2's average costs increase..."
- Page 321, part (d) should end with "...the equilibrium output, $\widehat{q}$."

5. **Chapter 5 - Choice under Uncertainty**

- Page 328.
  - Line 1, should read "...probability p_2^1 of outcome 2 occurring, and..."

- Figure 5.5: title should be "Compound lottery and its associated reduced lottery (example 5.1)".

- Page 329.
  - Example 5.1 should add the following explanation, so the last sentence reads "...that assigns the same probability weight to each lottery. To understand the position of each lottery in Figure 5.6a, first draw a dotted line connecting vertex 1 to the mid-point of the side connecting vertexes 2 and 3, which essentially divides Machina's triangle in two halves. Second, since both lotteries L_2 and L_3 assign a probability of $\frac{1}{4}$ to outcome 1, truncate the dotted line you just drew by $\frac{1}{4}$. Therefore, the line segment connecting vertex 1 to the point of truncation (about $\frac{3}{4}$ of the line segment) represents the "average lottery" where lottery L_2 and L_3 occur with equal probability, that is,

$$\begin{aligned}\frac{L_2+L_3}{2} &= \frac{1}{2}\left(\frac{1}{4},\frac{3}{8},\frac{3}{8}\right)+\frac{1}{2}\left(\frac{1}{4},\frac{3}{8},\frac{3}{8}\right)\\ &= \left(\frac{1}{4},\frac{3}{8},\frac{3}{8}\right)=L_2=L_3\end{aligned}$$

    Consider now a compound lottery where L_1 occurs with probability $\frac{1}{3}$ and the above average lottery $\frac{L_2+L_3}{2}$ with the remaining probability $\frac{2}{3}$. Graphically, this compound lottery must be $\frac{2}{3}$ away from vertex 1 and $\frac{1}{3}$ away from the point of truncation, respectively, such that

$$\begin{aligned}L &= \frac{1}{3}L_1+\frac{2}{3}\frac{L_2+L_3}{2}\\ &= \frac{1}{3}(1,0,0)+\frac{2}{3}\left(\frac{1}{4},\frac{3}{8},\frac{3}{8}\right)\\ &= \left(\frac{1}{3}+\frac{1}{6},\frac{2}{3}\frac{3}{8},\frac{2}{3}\frac{3}{8}\right)\\ &= \left(\frac{1}{2},\frac{1}{4},\frac{1}{4}\right)\end{aligned}$$

    Therefore, the compound lottery has outcome 1 occurring with probability $p_1=\frac{1}{2}$, outcome 2 occurring with $p_2=\frac{1}{4}$, and outcome 3 occurring with $p_3=\frac{1}{4}$."

- Page 330, Figure 5.6. The end title should read "...compound lottery (example 5.2)"

- Page 331, Figure 5.7.
  - The title should read "Simplex of reduced lottery (example 5.2)"
  - And the label at the center dot of the figure should read $\frac{1}{2}L_4+\frac{1}{2}L_5=\left(\frac{1}{2},\frac{1}{4},\frac{1}{4}\right)$.

- Page 332.
  - Line 12 (in the second paragraph), should read "In particular, $|\text{supp}(L)|=2$ while $|\text{supp}(L')|=91$, entailing that..."
  - Line 25 (after three displayed equations) should read "...than in lottery L', meaning that $p_2>p_2'$. As an example,..."
  - Line 28 (last sentence before bullet point 4) should read "...despite the fact that L assigns a larger probability..."

- Page 339,
  - Line 4 (first paragraph) should read "...weakly preferred to lottery L' if and only if $U(L)\geq U(L')$, or..."
  - The label of Figure 5.11 (right hand corner) should read "If $L\sim L'$, then $L\sim\alpha L+(1-\alpha)L'$" That is, the equal sign = should be replaced for a plus sign, +.

- Page 341, figure 5.13. The title ends with a full-stop, but the title of other figures have no full stops at the end.

- Page 345, section 5.4.1. Second line, there should be a space between $g(\cdot)$ and "to".
- Page 347, the last line should read "review by Machina and Siniscalchi (2014)."
- Page 361. Paragraph before Example 5.8, should read "... which we write as $\partial r_A(x)/\partial x < 0$. Intuitively, this implies..."
- Page 364, Footnote 21, Line 3, should add a parenthesis in the exponent of the last expression, so it reads "However, $u'_A(x_2)/u'_B(x_2) = \frac{a_A}{a_B}e^{(a_B-a_A)x_2}$, while..."
- Page 366:
  - Subsection 5.8.1, Line 3 should read "of relative risk aversion, $r_R(x)$, is that..."
  - Last displayed equation should add an equality sign so it reads

$$r'_A(x) = -\frac{u''' \cdot u' - (u'' \cdot u'')}{(u')^2} = -\frac{u''' \cdot u' - (u'')^2}{(u')^2} = -\frac{u'''}{u'} + \left(\frac{u''}{u'}\right)^2$$

- Page 367, Example 5.11:
  - Line 3 of Example 5.11 should read "...and 5.10 (CRRA). In the case..."
  - Line 7 of Example 5.11 should read "... of the CRRA in example 5.10, where..."
  - Last displayed equation should read

$$K_R(x) = (1-b) - x\frac{-\frac{1-b}{x^2}}{\frac{1-b}{x}} = 1 - b + 1 = 2 - b,$$

  - Last line should read "implying that, in this case, $K_R(x) > r_R(x)$."
- Page 368:
  - First line immediately after the first displayed equation should read "...as measuring the "cautiousness" of the individual, since $C(x) > 1$ implies..."
  - In the fourth line after the first displayed equation, spaces should be added, so it reads "...utility function yields $C(x) = 1$, whereas the CRRA entails $C(x) < 1$. The literature..."
  - The fifth line after the first displayed equation should read "...the coefficient of "temperance," as $T(x) = -u''''(x)/u'''(x)$, where as individual..."
  - Sixth line after the first displayed equation should read "...function is negative, $u''''(x) \leq 0$, and describes..."
- Page 374, Figure 5.31b (bottom of the page). The dashed line (corresponding to lottery G) should go up at a payoff of \$4, while the solid line (corresponding to lottery F) should continue until payoff \$5.
- Page 378, Footnote 26 should read "Note that, as in example 5.14, we cannot..."
- Page 379. In the text after the third displayed equation, please delete the sentence "Then, solving for $F(x)$, we obtain" and the displayed equation immediately after.
- Page 383. The first displayed equation should have a *prime* on the right-hand side, so it reads

$$\sum_s \pi_s(x_s)\, u_s(x_s) \geq \sum_s \pi_s(x'_s)\, u_s(x'_s)$$

- Page 386. The sentence immediately before the second displayed equation "... that in lottery L_B" (rather than lottery LB); and the following sentence should read "...and similarly for lottery L_A," (rather than lottery LA).
- Page 387. Subsection 5.12.2, previous to last line of the first paragraph should read "...then an example of a capacity is..."
- Page 392, Second line should read "the monetary payoff associated with every state of nature:"
- Page 394. The first displayed equation should have a *prime* on the right-hand side, so it reads

$$(x_1, x_2, ..., x_S) \succsim (x'_1, x'_2, ..., x'_S) \quad \text{if and only if} \quad \sum_s \pi_s(x_s)\, u_s(x_s) \geq \sum_s \pi_s(x'_s)\, u_s(x'_s).$$

- Page 398, Exercise 3, first displayed equation should read

$$\begin{aligned} v(g) &= (1+a_1)^{p_1} \times (1+a_2)^{p_2} \times \cdots \times (1+a_n)^{p_n} \\ &= \sum_{i=1}^{n} (1+a_i)^{p_i}. \end{aligned}$$

- Page 400, Exercise 7. Part (d) of the exercise should read "...answers from parts (a) and (b), find the risk premium..."
- Page 403, Exercise 12.
  - First paragraph, fifth line, should read "...and the number of police officers monitoring parking areas detects drivers parking illegally with a probability p, where $p \in (0,1)$. In order to reduce illegal parking, the mayor considers..."
  - Part (a) should read "...recommend to the mayor as..."
- Page 404, Exercise 17, part (a) should read "Find the coefficient of absolute risk aversion, $r_A(w,u)$. Does it increase..."
- Page 406, Exercise 23.
  - First line of the exercise should read "...for exactly two periods, $t = \{0,1\}$. Let $c_i \in \mathbb{R}$ denote..."
  - Last line before part (a) should read "Thus his consumption in period 0 is $w_0 - s$, and his consumption..."
- Page 406, Exercise 24. The first sentence should read "...with production function $q = f(x)$. At the end of the harvesting..."
- Page 407. Please add a full stop at the end of the first bullet point, so it reads "...and denote by w_0 the farmer's initial income."
- Page 408, Exercise 26. The last displayed equation of the exercise should read

$$\frac{\pi}{1-\pi} \frac{u'(x_1^*)}{u'(x_2^*)} = \frac{p_1}{p_2}.$$

- Pages 409-410. In the References section, please add the following references:
  - Cheng, H., M. Magill, and W. Shafer, 1987. Some Results on Comparative Statics Under Uncertainty, *International Economic Review,* 28 (2), 493-507.
  - Eeckhoudt, L., 2012. Beyond Risk Aversion: Why, How and What's Next?, *The Geneva Risk and Insurance Review,* 37: 141-155.
  - Fishburn, P.C. and R.B. Porter, 1976. Optimal Portfolios with One Safe and One Risky Asset: Effects of Changes in Rate of Return and Risk, *Management Science*, 22 (10), 1064-73.
  - Hahn, F. H., 1970. Savings and Uncertainty, *Review of Economic Studies*, 37 (1): 21-24.
  - Mitchell, D. W., 1994. Relative risk aversion with Arrow-Debreu securities, *International Economic Review,* 35 (1): 257-258.
  - Meyer, D. J., and J. Meyer, 2005. Relative Risk Aversion: What Do We Know?, *Journal of Risk and Uncertainty*, 31 (3): 243-262.
  - Rothschild, M. and J. E. Stiglitz, 1971. Increasing Risk II: Its Consequences, *Journal of Economic Theory,* 3 (1), 66–84.
  - Tversky, A. and D. Kahneman, 1986, Rational Choice and the Framing of Decisions, *The Journal of Business*, 59 (4), Part 2: The Behavioral Foundations of Economic Theory: 251-278.

5. **Chapter 6 - Partial and General Equilibrium**

- Page 436. Line 12 should read "Figure 6.16 separately depicts the aggregate demand, $\sum_{i=1}^{I} x_k^i \left(\mathbf{p}, \mathbf{p} \cdot \mathbf{e}^i\right)$ for good k and its aggregate supply $\sum_{i=1}^{I} e_k^i$, both in the left panel, and the resulting excess demand for this good k in the right panel."

- Page 444. Figure 6.20 should be defined in terms of consumers A and B, instead of 1 and 2.
- Page 446. The sentence "In addition, from the UMP of consumer B, we know that..." uses larger font than the rest of the text. Please adjust font size.
- Page 451. Paragraph after the last displayed equation, second line should read "...is decreasing in good 1 (as x_1 increases, MU_1^i decreases while MU_2^i increases). In contrast, $MRT_{1,2}^m = F_{2m}/F_{1m}$ is increasing in good 1. Intuitively,..."
- Page 452. Example 6.8. Sixth line should read "...consumer B is endowed with..." rather than "...consumer 2 is endowed with..."
- Page 463. The third displayed equation should read

$$\frac{dw_2}{dp_1} = -\frac{z_{12}}{z_{11}z_{22} - z_{22}z_{21}} < 0$$

- Page 478.
  - Line 9 should read "... substitution between inputs σ; (2) the price-elasticity..."
  - Line 15 should read "which still assumes that..."
- Page 481.
  - Exercise 3, part (b) should read "...solves your equality in part (a-i), then..." This should clarify that we are talking about the first section of part (a).
  - Exercise 4. Third line should read "... aggregate supply curve is $q(p) = \alpha p^\gamma$, where..."
- Page 484.
  - Exercise 16, after the displayed equations, immediately before part (a), should read "where consumer A's endowment is (e_1^A, e_2^A), and that of consumer B is (e_1^B, e_2^B)."
  - Exercise 17. Last line should read "where x_i^A is the consumption of good i by A, where $i = \{1, 2\}$. Consumer A has endowments..."
- Page 486. Exercise 22. The last sentence before part (a) should read "The production function is $y_2 = 3y_1$, and the firm operates in a perfectly competitive market facing prices $p_1 > 0$ and $p_2 > 0$. Compute the equilibrium price and allocation."

7. **Chapter 7 - Monopoly**

6. **Chapter 8 - Game Theory and Imperfect Competition**

- Page 575.
  - Please change α_E and α_{NE} for α_H and α_L, respectively (in page 575, first line and fourth paragraph just after second displayed equation).
  - First displayed equation (top of the page) should read

$$\mu = \frac{\frac{1}{3}\alpha_H}{\frac{1}{3}\alpha_H + \frac{2}{3}\alpha_L} = \frac{\frac{1}{3} \times 1}{\frac{1}{3} \times 1 + \frac{2}{3} \times 0} = 1.$$

  - Second displayed equation (center of the page) should read

$$\gamma = \frac{\frac{1}{3}(1 - \alpha_H)}{\frac{1}{3}(1 - \alpha_H) + \frac{2}{3}(1 - \alpha_L)} = \frac{\frac{1}{3} \times 0}{\frac{1}{3} \times 1 + \frac{2}{3} \times 0} = 0.$$

  - First bullet point (bottom of page), last sentence should read "... a manager (M) in the right-hand side of the tree..."
  - Second bullet point (bottom of age), last sentence should read "... the branch corresponding to C' in the left-hand side of the tree..."
- Page 577.
  - Please change α_E and α_{NE} for α_H and α_L, respectively, everywhere in this page.

– First displayed equation (middle of the page) should read

$$\gamma = \frac{\frac{1}{3}(1-\alpha_H)}{\frac{1}{3}(1-\alpha_H)+\frac{2}{3}(1-\alpha_L)} = \frac{\frac{1}{3}\times 1}{\frac{1}{3}\times 1+\frac{2}{3}\times 1} = \frac{1}{3},$$

– Second displayed equation (bottom of the page) should read

$$\mu = \frac{\frac{1}{3}\alpha_H}{\frac{1}{3}\alpha_H+\frac{2}{3}\alpha_L} = \frac{\frac{1}{3}\times 0}{\frac{1}{3}\times 0+\frac{2}{3}\times 0} = \frac{0}{0},$$

- Page 612. First displayed equation (top of the page) should read

$$\pi(n) + n\left[p(nq(n)) - c'(q(n))\right]\frac{\partial q(n)}{\partial n} = 0.$$

- Page 636. Exercise 23 (sixth line). The last part of the sentence should read "...and share demand equally." rather than "...and share equally demand."
- Page 636. Exercise 24 should be titled "Cournot competition with exponential inverse demand"
- Page 638, Exercise 30, part (c-i), last line should read "...as found in example 8.15" rather than "...as found in example 8.17".

7. **Chapter 9 - Externalities and Public Goods**

- Page 654. The second displayed equation should read

$$x_i = \frac{a-c}{2b} - \frac{b+c\alpha}{b}x_j$$

- Page 657. Third displayed equation should read $\overline{N} = \frac{(1+\theta)(1+2\theta)}{2d(1+2\theta)-\theta}$. The subsequent paragraph should read "...holds for all $d > 1/2$. In words, when..." Then, please delete the last sentence of the paragraph starting at "For instance, at..." until the end of the paragraph.
- Page 658. Line 12, above the maximization problem, should read "Given this constraint on the set of acceptable offers, the affected individual (with wealth w_2), chooses the pair (x, T) that solves the following problem"
- Page 667.
  – Please add a fourth point to the list in this page saying:
  – "4. The tax leads to a socially optimal outcome if it is costless to implement. Otherwise, if tax collection is costly, the government may prefer to set a quota, instead of a tax, if its administrative costs are lower. For more details on transaction costs behind different policies, see Williamson (1986)."
- Page 674. Sentence immediately before the last displayed equation should read "induces positive output levels from both firms, we only need that firms' costs are relatively close to each other, that is,"
- Page 687.
  – Line 5 should read "constrained minimization problem".
  – Line 16 should read "For a cost-minimizing firm..."
- Page 688. Subsection 9.10.2. Fourth line should read "... as captured by d_{kj}, which is, generally, decreasing in the distance between measuring stations. That is, the measurement at station m_k can be..."
- Page 690. Title of Table 9.1 should read "Taxonomy of goods."
- Page 693. Example 9.5. Fourth line of this example should read "...cost of producing the public good is cg, where $c > 0$, then the Pareto..."

- Page 701. Fourth displayed equation should read

$$g_i(G_{-i}) = \begin{cases} (1-\alpha)w - \alpha G_{-i} & \text{if } G_{-i} < \frac{1-\alpha}{\alpha} w \\ 0 & \text{otherwise,} \end{cases}$$

- Page 702. Second displayed equation should read as follows

$$\begin{aligned} \frac{\partial G^*}{\partial N} &= (1-\alpha)w \frac{1+\alpha(N-1)-\alpha N}{[1+\alpha(N-1)]^2} \\ &= \frac{(1-\alpha)^2 w}{[1+\alpha(N-1)]^2}. \end{aligned}$$

- Page 705. Paragraph starting with "Intuitively, these markets..." makes use of "her" in lines 2 and 3 of the paragraph. Change to "his" both times.
- Page 707.
  - The second displayed equation (maximization problem at the center of the page) should have $g_1, ..., g_N$ below the max operator, rather than the current $x_1, ..., x_N$. This equation should also have a v_i rather than v.
  - The third displayed equation should read

$$\frac{\partial v_i(g_i, G_{-i})}{\partial g_i} + \sum_{j \neq i} \frac{\partial v_j(g_i, G_{-i})}{\partial G_{-i}} \frac{\partial G_{-i}}{\partial g_j} - \frac{\partial C(G)}{\partial g_i} \leq 0 \quad \text{for all } i,$$

    Since $G_{-i} = g_1 + ... + g_{i-1} + g_{i+1} + ... + g_N$, we obtain that $\frac{\partial G_{-i}}{\partial g_j} = 1$, which simplifies the above expression to

$$\frac{\partial v_i(g_i, G_{-i})}{\partial g_i} + \sum_{j \neq i} \frac{\partial v_j(g_i, G_{-i})}{\partial G_{-i}} - \frac{\partial C(G)}{\partial g_i} \leq 0,$$

    which in the case of interior solutions..."
- Page 709. Line 12 should read "...a transfer from individual 2 to 1, namely, $dw_1 > 0$ and $dw_2 < 0$, where..."
- Page 710. Last paragraph, second line should read "transfer from individual 2 to 1 is not necessarily neutral, as it can increase..."
- Page 712. Title of Table 9.2 should read "Payoff matrix under no social preferences", and the title of Table 9.3 should read "Payoff matrix under social preferences".
- Page 728, Exercise 9. Third line should read "... how many dollars to contribute to a public good whose price is normalized to \$1. Assume that each individual i has wealth, $\omega_i \geq 0$, and a Cobb-Douglas utility function..."
- Page 730. Exercise 13. Line immediately after the two displayed equations should read "linear in wealth, w." rather than "linear in money, w."

8. **Chapter 10 - Contract Theory**

- Page 739. Case 1, third line should read "...collapses to $B'(\pi_i - w(\pi_i)) = 1$. Hence the FOC in expression..."
- Page 742. First line should replace the equation number (3) with (10.3), for consistency, reading "...whether the FOC in expression (10.3) identifies..."
- Page 743.
  - Fourth line should read "The agent's salary is hence $w(\pi_i) = \pi_i - K$, where..."
  - After the second displayed equation, the sentence should read: "where K is independent of the profit realization, entailing that $\sum_{i=1}^{N} f(\pi_i|e) K = K$. In this context, the principal's expected profit is"

– Third displayed equation should read

$$\sum_{i=1}^{N} f\left(\pi_i|e\right) B\left(\pi_i - w(\pi_i)\right) = \sum_{i=1}^{N} f\left(\pi_i|e\right) B\left(\pi_i - (\pi_i - K)\right) = \sum_{i=1}^{N} f\left(\pi_i|e\right) B\left(K\right) = B\left(K\right)$$

– Fourth displayed equation should read

$$\max_{e\geq 0} B(K) = B\left(\sum_{i=1}^{N} f\left(\pi_i|e\right)\pi_i - \overline{u} - g(e)\right).$$

– Fifth displayed equation should read

$$B'\left(\sum_{i=1}^{N} f'\left(\pi_i|e\right)\pi_i - g'(e)\right) = 0$$

which collapses to

$$\sum_{i=1}^{N} f'\left(\pi_i|e\right)\pi_i = g'(e)$$

since $B' > 0$. That is, effort is increased until the point where the marginal expected profit ..."

- Page 756. Line 13, after the fourth displayed equation, should read "The agent's reservation utility is $\overline{u} = \frac{1}{2}$. The principal offers..."
- Page 757.
  – Fifth displayed equation, labeled as (PC) should read "subject to $a + be - \frac{1}{2}\rho b^2\sigma^2 - \frac{1}{2}e^2 \geq \frac{1}{2}$ (PC)"
  – Line 7, should read "... to a more compact expression, $a + \frac{1}{2}b^2\left(1 - \rho\sigma^2\right) \geq \frac{1}{2}$, which yields a problem..."
  – Eight displayed equation, labeled as (PC), close to the bottom of the page, should read "subject to $a + \frac{1}{2}b^2\left(1 - \rho\sigma^2\right) \geq \frac{1}{2}$ (PC)"
  – Last displayed equation should read $L = (1-b)\,b - a + \lambda\left[a + \frac{1}{2}b^2\left(1 - \rho\sigma^2\right) - \frac{1}{2}\right]$.
- Page 758.
  – First line should read "first-order conditions" rather than "Kuhn-Tucker conditions".
  – Third displayed equation, labeled as (10.15) should read $\frac{\partial \mathcal{L}}{\partial \lambda} = a + \frac{1}{2}b^2\left(1 - \rho\sigma^2\right) - \frac{1}{2} = 0$.
  – Fifth displayed equation should read $a + \frac{1-\rho\sigma^2}{2(1+\rho\sigma^2)^2} = \frac{1}{2}$.
  – Sixth displayed equation should read $a = \frac{1}{2}\left[1 - \frac{1-\rho\sigma^2}{(1+\rho\sigma^2)^2}\right]$.
  – Seventh displayed equation should read "

$$b = \frac{1}{1+\rho 0} = 1 \quad \text{and} \quad a = \frac{1}{2}\left[1 - \frac{1-\rho\times 0}{(1+\rho\times 0)^2}\right] = 0.$$

  – Line 12 should read "Intuitively, the principal does not offer a fixed payment, and the agent is benefited from high-powered incentives, ..."
  – Eight displayed equation, at the bottom of the page, should read as follows

$$b = \frac{1}{1+\rho} \quad \text{and} \quad a = \frac{1}{2}\left[1 - \frac{1-\rho}{(1+\rho)^2}\right] = \frac{p\,(p+3)}{2\,(1+\rho)^2}.$$

- Page 759.

– The first paragraph should be replaced with the following "When the agent becomes more risk averse (ρ increases), he receives a higher fixed payment but a lower bonus, since

$$\frac{\partial b}{\partial \rho} = -\frac{1}{(1+\rho)^2} < 0$$
$$\frac{\partial a}{\partial \rho} = \frac{3-\rho}{(1+\rho)^3} > 0$$

In addition, differentiating the fixed payment, $a = \frac{1}{2}\left[1 - \frac{1-\rho\sigma^2}{(1+\rho\sigma^2)^2}\right]$, with respect to σ^2, we obtain that

$$\begin{aligned}\frac{\partial a}{\partial \sigma^2} &= -\frac{-\rho\left(1+\rho\sigma^2\right)^2 - 2\rho\left(1+\rho\sigma^2\right)\left(1-\rho\sigma^2\right)}{2\left(1+\rho\sigma^2\right)^4} \\ &= \frac{\rho\left(1+\rho\sigma^2+2-2\rho\sigma^2\right)}{2\left(1+\rho\sigma^2\right)^3} \\ &= \frac{\rho\left(3-\rho\sigma^2\right)}{2\left(1+\rho\sigma^2\right)^3}\end{aligned}$$

which is positive as long as $\rho\sigma^2 < 3$, and is satisfied when $\sigma^2, \rho \leq 1$. In this context, when the outcome becomes more volatile (higher σ^2), the fixed payment a increases. Differentiating $b = \frac{1}{1+\rho\sigma^2}$ with respect to σ^2, we obtain

$$\frac{\partial b}{\partial \sigma^2} = -\frac{\rho}{\left(1+\rho\sigma^2\right)^2} < 0$$

which is unambiguously negative, so that when the outcome becomes more volatile, the bonus b decreases. In summary, the agent receives high-powered incentives when σ^2 is low (low a and high b), and low-powered incentives when σ^2 is high (high a and low b)."

– First displayed equation should read

$$\frac{1}{u'(w)} = \lambda + \mu\left[1 - \frac{f(\pi, s|e_L)}{f(\pi, s|e_H)}\right].$$

– Four lines to the bottom of the page, it should read "if salary increases in the signal, $w(\pi, s_2) > w(\pi, s_1)$", that is, delete a vertical bar inside the parenthesis.

– Last displayed equation should read

$$\lambda + \mu\left[1 - \frac{f(\pi, s_2|e_L)}{f(\pi, s_2|e_H)}\right] > \lambda + \mu\left[1 - \frac{f(\pi, s_1|e_L)}{f(\pi, s_1|e_H)}\right]$$

- Page 769. First line of subsection 10.5.2 should read "When the firm cannot observe the worker's type (but knows that the probability of high types is p and that of low types is $1-p$), it seeks to maximize the expected..."
- Page 780. Last sentence of the first paragraph should read "lump-sum price of F_K where $K = \{L, H\}$, which the consumer..."
- Page 784. Figure 10.14. Probability q in the labels on the vertical axis should read p, so the highest label on the vertical axis reads $c_H + gp\frac{c_H - c_L}{(1-p)(1+g)}$.
- Page 785.
  – Example 10.8 should be replaced with the following: "**Example 10.8. Monopoly regulation.** Consider a utility function $u(q) = \sqrt{q}$ and cost function $C_i(q) = C + c_i q$, where c_i denotes the marginal cost of firm $i = \{L, H\}$ and $c_L < c_H$. Since $u'(q) = \frac{1}{2\sqrt{q}}$, the output of the low-cost firm, q_L, solves $\frac{1}{2\sqrt{q_L}} = c_L$, which we rearrange to yield $q_L = \frac{1}{4c_L^2}$. Similarly, the output of the high-cost firm solves

$$\frac{1}{2\sqrt{q_H}} = \frac{(1+g-p)c_H - pgc_L}{(1-p)(1+g)}$$

which we can rearrange to yield

$$q_H = \frac{(1-p)^2 (1+g)^2}{4\left[(1+g-p)\, c_H - pgc_L\right]^2}$$

As an illustration, consider $C = \frac{1}{4}$, $c_H = \frac{1}{8}$, $c_L = \frac{1}{16}$, $g = \frac{1}{24}$, and $p = \frac{1}{2}$. Inserting these parameter values into our above results, we find that the low-cost firm produces the same amount under symmetric and asymmetric information,

$$q_L^{AI} = \frac{1}{4 \times \frac{1}{16^2}} = 64 = q_L^{SI}$$

whereas the high-cost firm produces a lower output under asymmetric information because

$$q_H^{AI} = \frac{\left(1-\frac{1}{2}\right)^2 \left(1+\frac{1}{24}\right)^2}{4\left[\left(1+\frac{1}{24}-\frac{1}{2}\right)\frac{1}{8} - \frac{1}{2}\times\frac{1}{24}\times\frac{1}{16}\right]^2} = \left(\frac{200}{51}\right)^2 \simeq 15.38 < 16 = q_H^{SI}.$$

as depicted in figure 10.14. ■"

- Page 788. Exercise 5. Line immediately before part (a) should read "and there is no discounting."
- Page 795. Exercise 13. First displayed equation (top of the page) should read $u^i(e,w) = w - \theta_i e^2$.
- Page 796. Exercise 17. Paragraph immediately below the second displayed equation should read "...denotes his preference for quality (where $\alpha_H > \alpha_L > 1$), x represents the quality..."

9. **Mathematical appendix.**