

Errata
Microeconomic Analysis
Hal Varian
August 1999

Errata remaining

p120, second to last line of the proof. Add reference to Shephard's lemma to make proof clearer.

Fixed for printing 9 _____

p10, 6 up. Probably want $x_1^a x_2^{1-a} \geq y$. (Anthony J.F. Biagioli)

p97. "marginal rate of substitution" should be an index entry, not visible.

p166, 3 lines up. Reverse the integration bounds. (Thijs ten Raa)

Fixed for printing 8 _____

A7, journal date for nonparametric production should be May 1984. (fixed)

38, journal date for nonparametric production should be May 1984. (fixed)

114, (and A17) answer to 7.5b should be $u(1)$, not $u(1) - 1$. (Juan Manuel Dubra) (fixed)

181, bottom of page. Replace w with ϵ . (Prasanta Mahapatra) (fixed)

208, 3rd,4th, and 6th displayed equation. logs missing before two terms. (Andrea Bugin) (fixed)

407, 2nd line of proof, the last term should be x_i , not x'_i . (Tuomo Pentikainen) (fixed)

450, line 11. Should have u_2 rather than u_b . (Frank Vandenbroucke)

463, line 12. "reducing" should be "increasing." (Frank Vandenbroucke)

Fixed for printing 7 _____

219, 8 lines up. "prices" should be "price". (Juan Nagel)

257, 14.22. Fix punctuation in equation. (Dave Malueg)

295, 3rd displayed equation. Move period up from denominator. (Robert Frank)

297, below equation (16.10). Second "inequality" should be "equality". (Robert Frank)

356, Fix Samuelson51, Weizsäcker. On page A7 use lower case "von". (Robert Frank)

399, 2nd equation. Last term should have $\mathbf{p}(t)$. (Robert Frank)

402, 2nd equation. Replace $\partial p_j / \partial t$ with dp_j / dt . (Robert Frank).

462, 6 down. Replace "low cost" with "high-cost". (Robert Frank)

Fixed for printing 5 _____

Chapter 1

9, second theorem. Should have $f(\mathbf{x})$. (Stephen Siklos)

Chapter 3

47, last displayed equation. Last term should have an S subscript. π_S . Also would be better to put S and L subscripts on the net supply functions. (Stephen Siklos)

Chapter 4

51, 5 up. Add more lines to figure. (Louis-Paul LECLAIR)

61, line 1. “maximum” should be “optimum”.

Chapter 5

78, problem 5.9. Answer should be $p'(\alpha) = n[y + \alpha p/c'']/[D'(p) - n\alpha/c''] < 0$. (Hal Varian)

Chapter 6

83, 5 up. Should say $c(\mathbf{w}, y)$.

Chapter 7

106, 3 lines down in 2nd paragraph. Missing “that” before “the”. (Louis-Paul LECLAIR)

114, 7.1, 2 lines down. Probably use “if” rather than “iff”. (Louis-Paul LECLAIR)

Chapter 8

132, 18 down. “the” instead of “that”. (Louis-Paul LECLAIR)

Chapter 9

144, 3 lines after 9.1. “in” should be “is”. (Susanne Trimboth)

149, after calculation: should be capital V and capital U .

Chapter 10

162, 19 up. “function” should be plural twice. (Louis-Paul LECLAIR)

162, 19 down. Should be “how can we”. (Louis-Paul LECLAIR)

168, 6 up. Replace 1 with a prime. (Jianmao Wang)

170, 6 up and 9 up. The definitions of m^+ and m^- should be interchanged.

Chapter 12

207, 10 up. Should be $\beta_1 = -\beta_2$.

Chapter 13

222, 5 down. Should be Chapter 10.

Chapter 14

234, 9 down. $D(p) \geq y$.

238, 14 down. Eliminate max.

Chapter 15

268, 13 up. “left” should be “top”, “right” should be “bottom”.

Chapter 17

330, 11 up. Should say “Kuhn-Tucker multipliers”.

Chapter 18

348–349, last line, first line. The X^g terms should not be bold.

Chapter 19

362, 5 down. Should say “discounted marginal indirect utility”. p 365, middle of page. $2n$ agents are alive at any point *after the first period*.

363, 15 up. Replace t with T .

Chapter 20

372, 9 up. x_i should be x_a .

379, 14 down. Should say “marginal utility”.

Chapter 22

410, 12 down. Change x to bold \mathbf{x} .

412, 9 down. Replace j with i .

Chapter 23

417, Table 23.2. Should be Table 23.1. Change “Player” to “Consumer”. (Susanne Trimboth)

428, 12 down. Change sign of sidepayment in first two displayed equation.s (David Bradford)

Chapter 25

443, displayed equation in middle of page should be

$$s(x) = \begin{cases} \bar{u} + c(b^*) & \text{if } x = x(b^*) \\ -\infty & \text{otherwise} \end{cases}$$

Chapter 27

500. It is necessary to assume that $b_1 \neq 0$. (See p. 391 of Blume and Simon.) (Stephen Siklos)

Fixed for printing 4

Chapter 1

8–9, last line. “and another vector \mathbf{x}' also produces y units of” is repeated. (Erik Gartzke)

9, 8 up. “But a function . . .” (Gerhard Sorger)

Chapter 2

27, Fig 2.1. Should have 0 output at 0 input. (Carlos Carranza)

28, last sentence. “are” should be “is” (Paquita Davis)

29, 16 up. Should say $p \leq w$. (Gerhard Sorger)

32, 12 up. Parenthesis missing in 2nd order condition. (Gerhard Sorger)

32, 5 up. Replace “strict” with “regular”. (Gerhard Sorger)

33, 5 up. Replace “strict” with “regular”. (Gerhard Sorger)

Chapter 3

44, 5 up. Equality sign missing. (Gerhard Sorger)

47, 3 up. Last term should have subscript S : $\pi_S(p^*, z^*)$. (Sebastian Maurice)

Chapter 4

60, last line. Replace “strict” with “regular”. (Gerhard Sorger)

61, 2nd display formula. Probably want to say “for all t, s such that”

Chapter 5

66, line 11. Replace x by x_1 . (Gerhard Sorger)

69, last line of 1st full paragraph. Should say “... average variable cost curve.” (Gerhard Sorger)

69, first line of 2nd full paragraph. Should say “... average variable cost ...” Second line should say “marginal cost.” (Gerhard Sorger)

73, Fig 5.4. The w_i in the summation should be w_i^* . (Michael Hanson)

74, Replace “condition” by “conditional”. (Gerhard Sorger)

74, 9 up. Replace w_i by w_i^* . (Gerhard Sorger)

75, 9 down. $g(x_1, x_2, a)$. (Gerhard Sorger)

76, line 3 of section 5.6. Replace “demand and supply” with “conditional factor demand”. (Emons Winand)

76, last line. The w_i in second term should not be bold. (Marco Ottaviani)

77, 3 down. Make w into \mathbf{w} . (Gerhard Sorger)

78, Exercise 5.10. Replace “price” by “prices”. (Gerhard Sorger)

79, answer to 5.10. There should be a minus sign before the last summation. (Timothy L. Sorenson)

Chapter 6

81, last sentence. “trival” should be “trivial” (Paquita Davis)

86, line 4. Section 2.4 should be section 5.6. (Marco Ottaviani)

89, Figure 6.2. In order to match the discussion in the text, we should have a sharply curved isoquant and a relatively flat isocost curve. (Marco Ottaviani)

90, 2 lines above Example. “the” is missing before cost. (Paquita Davis)

91, Figure 6.4. Eliminate kink in 1st isoquant.

Chapter 7

97, first line. Should say “strictly convex preferences.”

97, 7 from bottom. Should use x_k , not x_n . (Lars Otto)

99, line 3. Give exact page number for strict convexity. (Lars Otto)

104-5, last line on 104=first line on 105. (Christopher Voisey)

105, last line. $u(\mathbf{x})$ (Gerhard Sorger)

107, 2nd and 3rd formulas. \mathbf{p} should be \mathbf{p}^* . (Bert Schoonbeek)

109. Figure 7.5. Should have $m(p, x)/p_2$ on vertical axis. (Jennifer Novak)
 109, Figure 7.6. Should have $\mu(p, q, m)/p_2$ on vertical axis. (Jennifer Novak)

Chapter 8

- 116, 3 down. “changes” should be “change”. (Paquita Davis)
 118. Figure 8.2 Redraw figure to make backward bending offer curve more extreme. (Eric Rasmussen)
 123, line 7. Middle two terms should switch p_i and p_j in the denominators. (Marco Ottaviani)
 126, 3 up. Should have u^0 . (Paquita Davis)
 132, line 1. “patters” should be “patterns”.

Chapter 9

- 146, 3rd displayed equation. $[\bar{L} - \ell]$ should be $[\bar{L} - L]$. (Michael Carter)
 149, 4 up from “The two good model.” Should have V instead of v . (Lars Otto)
 149, last line. “timed” should be “times”. (Marco Ottaviani)
 150, Functional separability. Should use different notation for subutility, since v has been used for indirect utility. (Lars Otto).
 155, first equation. Add “for $i = 1, \dots, k$.”
 156, “inequalities” should be “equations” (Paquita Davis)
 156, 2nd formula. n in summation should be k . (Bert Schoonbeek)
 157, Notes. Pollak69 should be Pollak (1969). (Hal Varian)
 158, 10 down. “What is the associated ...” (Gerhard Sorger)

Chapter 10

- 162, 10 lines from bottom. Reword this sentence for clarity. (Gerhard Sorger)
 163, Figure 10.1. Should indicate that $p_2 = 1$ in this diagram. (Lars Otto)
 165, 5 up and 1 up. p should be p_1 . (Gerhard Sorger)
 166, last line. add “plus income.” (Steven Buccola) OK
 169, 12 up. “the indirect utility function”
 169, halfway down. Note transition to considering only a single price.
 170, between 16 down and 4 up, replace x with \mathbf{x} and x_0 with \mathbf{x}_0 . (Gerhard Sorger)
 173, line 3. = should be \sim . (Bert Schoonbeek)
 182, probably want to say “nondegenerate” random variable. (Andras Simonovits)
 188, 11.11. Should be $E\tilde{R}_i$. (Gerhard Sorger)

Chapter 12

- 202, line 16. Should be $m(\mathbf{p}, \mathbf{x}, \beta)$. (Gerhard Sorger)
 202, line 13. Should say “hypothesize”. (Karen Eggleston)
 205, 12.7. p/q should be p_i/q_i . (Gerhard Sorger)
 205, 6 up. Eliminate “the”. (Gerhard Sorger)

212, $\ln z$ should be $\ln z_i$. (Gerhard Sorger)

Chapter 13

218, 15 down. y_1 should be y . (Bert Schoonbeek)

222, 2 up. Maximize over y also. (Bert Schoonbeek)

223, Figure caption. Should say “equilibrium quantity”. (B.R. Dijkstra)

224, 15 down. Should be “multiple consumers”. (Gerhard Sorger)

224, 6 up. Last summation should have m as upper limit. (Richard Sperling)

226, 3 down. Should be \bar{u}_2 . (Gerhard Sorger)

232, 6 down. Should say “Let y denote”. (Gerhard Sorger)

Chapter 14

240, 8 up. Replace x and q by x_m and q_m . (Gerhard Sorger)

246, 2 lines up from (14.15). Should have $u'_2(x) > u'_1(x)$. (Wes Wilson)

255, 3 up. Say “taxing one of”. (Gerhard Sorger)

256, 14.18. Should tell students to ignore budget constraint. (Art Denzau)

261 etc., Be consistent about “prisoner’s” or “prisoners” dilemma! (Ted Bergstrom)

270, 9 up. Lower limit should be $t = 0$. (Bert Schoonbeek)

Chapter 16

286, 3rd formula. π should π_i . (Bert Schoonbeek)

286, 14 down. $c'_2(y_2)$. (Gerhard Sorger)

289, 6 up and 10 up. Should have ∂^2 . (Bert Schoonbeek)

292, line 9. Replace p_1 by c_2 . (Bert Schoonbeek)

295, 5 down. Should say “substitute Greek for Roman” (Sebastian Maurice)

296, 18 down. “yield constant”. (Gerhard Sorger)

298, 8 down. Replace “model” with “firm”. (Gerhard Sorger)

298, 12 up. A parenthesis is missing in formula. (Gerhard Sorger)

298, 3rd formula. Should have $g_2(p_1)$. (Bert Schoonbeek)

299, 3 up. c' should be c'_1 . (Bert Schoonbeek)

301, 7 up. “that” should be “than”. (Bert Schoonbeek)

301, 23. Remove “each firm”. (Karen Eggleston)

304, 2 down. “less” should be “more”. (Bert Schoonbeek)

304, 20 “will not produce at its quota” (Gerhard Sorger)

304, 5 up. Replace p_2 by y_2 in formula. Probably replace y_1 and y_2 by y_1^* and y_2^* . (Gerhard Sorger)

306, 3 down. firm 2 should be firm 1. (Bert Schoonbeek)

309, 7 up. Replace 2 by 3. (Gerhard Sorger)

309, 17 up. Replace “incumbent” by “entrant”. (Roland Schroeder)

310, 16. Replace Sing84 by Singe and Vives (1984). (Hal Varian)

311, 16.11, line 4. Make $k = c$ to agree with answer. (Hal Varian)

Chapter 17

317, 2 up. Change $=$ to \equiv . (Karen Eggleston)

330, max problem. Should say $\max_{x_i^g, x_j^g} u_i(\mathbf{x}_i)$ Do not use i as summation index in constraint. (Gerhard Sorger)

330, line 5, x_i^g should not be bold. (Buccola)

331, 2nd formula and line below 3rd formula, \mathbf{p} should \mathbf{p}^* . (Bert Schoonbeek)

331, 4th formula. Put stars on p 's in fraction. (Bert Schoonbeek)

332, max problem. Upper limit of sum should be n , not k . (Gerhard Sorger)

334, 2nd line of proof. Should be "exist". (Gerhard Sorger)

334, line 2. Replace "that" by "the". (Karen Eggleston)

337, 10 down. Should say "quasilinear utility functions, so that $v_i(\mathbf{p}, m_i) = v_i(\mathbf{p}) + m_i$." (Sam Bucovetsky)

337, 17.7 3rd line. \mathbf{p}^* , not p_* . (Gerhard Sorger)

337, 7 up. $\mathbf{p} \geq 0$. (Gerhard Sorger)

338, 9 up. n should be k (twice). (Bert Schoonbeek)

339, line 1. "1" should be "2". (Karen Eggleston)

340, 1st line of section. "aggregate net supply function" (Karen Eggleston)

343, 5. Make "conventions" singular. (Karen Eggleston)

344, 9 up. Eliminate comma from \succ_i . (Gerhard Sorger)

344, statement of theorem. Probably want Y and Y_j , not bold. (Gerhard Sorger)

346, line 9 and 13. Probably want Y_j . (Gerhard Sorger)

347, last formula. $j - 1$ should be $j = 1$. (Bert Schoonbeek)

346, item (2). Don't need to repeat y'_j is in Y_j . (Marco Ottaviani)

348, line 1. Interchange \mathbf{y}' and \mathbf{y}^* . (Marco Ottaviani)

348, 4 up. T should not be bold.

355, 10 down. "maximum ratio" not "maximum difference"

Chapter 19

363, 2nd line after equations. $1 - \alpha$ should be $1 + \alpha$.

363, middle of page. "following" should be "preceeding" (Karen Eggleston)

364, 19 down. Replace "agent t " with "the agent".

366, line 11. Sentence should say: "...market in these contracts, and that at any price ..."

Chapter 20

373, equation for μ . Minus sign missing on RHS. (Marco Ottaviani)

374, \bar{R}_f should be replaced by R_0 . (Marco Ottaviani)

376, 19 down. b_{0a}

378, 1st section, line 2. “is” should be “are” (Karen Eggleston)

379, 1st equation. Right paren missing.

Chapter 21

391, figure 21.2. x should be x^* . (Bert Schoonbeek)

393, Figure 21.3. Consumers should be A and B , not 1 and 2. Demands should have $*$ and $'$, not bar and tilde. (Marco Ottaviani)

394, 2nd paragraph of 21.3, line 6. Delete comma. (Karen Eggleston)

395, definition of gross substitutes. Want strict inequality. (Bert Schoonbeek)

397, 4 down. Say “of the excess supply function, $-\mathbf{Dz}(\mathbf{p})$.”

397, 10 up. Replace n by k . (Buccola)

399, 1 sentence up. Eliminate “using the definition of excess demand” since it isn’t used until the next step. (Marco Ottaviani)

399, line 15. Use strict inequality. (Bert Schoonbeek)

399, paragraph starting with Debreu. “the utility” and “any dynamical”. (Karen Eggleston)

400, line 3–4. Say “satisfied by any ...”. (Marco Ottaviani)

400, 5 from bottom. Dot is missing over p . (Marco Ottaviani)

401, line 2. The last p^* should be p_i^* . (Marco Ottaviani)

Chapter 22

405, 18 down. \mathbf{x} should be \mathbf{x}' .

411, 11 up and 9 up. Should have $= 0$.

412, 7 up. Replace $1/\theta$ by θ .

416, 14 from bottom. Should be “exceed” not “exceeds”.

419, 5 up from example. Should say “public good”.

424, before 1st displayed equation. Should say “is given by”.

427, 3 up. Delete “payments”.

427, item (3). “the sum”. (Karen Eggleston)

429, 8 up. Delete comma. (Karen Eggleston)

431, 1st line. Delete comma. (Karen Eggleston)

Chapter 24

436, line 12. Should say “examination of the proof of the theorem.”

437, 24.4. Should be $2(t_2 - t_1)$.

Chapter 25

443, 25.2. Should say $c(a)$.

444, 1st line of 3rd paragraph. There is an extra “the” here. (Marco Ottaviani)

446, 4 lines after 25.5. Should say “both participants”.

455, 7 lines above example. Should say “If the zero ...”

- 456, 1st line after equations. Replace “accident” with “theft”.
- 459, 2 down. Should say “pay $A + D$ if output is” (John Fingleton)
- 461, 9 down. Last term should be $c_2(x_1)$.
- 462, 1st paragraph. Should say “The low-cost agent produces where its marginal benefit equals marginal cost; the low cost agent produces at a point where its marginal benefit exceed its marginal cost.” (Karen Eggleston)
- 462, 6 lines after figure. “agents” should be “agent’s”.
- 463, line 11. “high” should be “low”. (Karen Eggleston)
- 463, last line. Replace “one one” by “only one”.
- 464, 3 lines after (c). Should be “different”.
- 467, 8 lines below caption. (s'_1, s'_2) should be (s'_1, x'_1) .
- 468, 1 line from bottom. Comma should be period. (Also sentence is poorly worded.)

Chapter 26

- 474, line 5. Should say “some t_i ”.
- 474, line 9. Make x bold.
- 475, line 17. m -by- n .
- 479, line 2. f should be boldface.
- 479, 4 and 5 up. $\mathbf{D}^2 f$ rather than D^2 .
- 481, 12 up. $t^k f(\mathbf{x})$
- 481, 1 up. Replace ∂tx_i by ∂x_i .
- 482, 4 down. Replace ∂tx_i by ∂x_i .
- 482, 14 down. Replace “properties” by “functions”.
- 483, 5 up. The ∂ sign is missing in the middle two terms.
- 485, line 20. Replace x by \mathbf{x} .
- 485, 9 up. Replace $\dot{\mathbf{x}}$ by $f(\mathbf{x})$.

Chapter 27

- 489, line 2. Replace $-x^2$ with $-x^4$. (Eric Rasmussen)
- 489, Figure 27.1. Replace “changes” with “grows” in the figure caption twice. (Ahmet Akyol)
- 494, line 8. Replace \mathbf{H} by H .
- 495, line 6. “is a”
- 496, line 6. “is at least”
- 496, bottom of first section. Should use $-x^4$. (Jinku Lee)
- 497, center equation and last equation. Probably want $-g(\mathbf{x})$. (Jinku Lee)
- 498, bottom of page. Should have $1/\lambda$ in front of $\partial f(\mathbf{x})/\partial x_i$. (Marco Ottaviani)

Appendix

Problem 3.4 in Answers manual: The second factor is omitted from the first order condi-

tions, should be

$$pa_1x_1^{a_1-1}x_2^{a_2} - w_1 = 0$$

$$pa_2x_2^{a_2-1}x_1^{a_1} - w_2 = 0,$$

A9, 1.7. Right parenthesis missing in first equation. (Marco Ottaviani)

A9, 5 up. Delete “that shows”.

A22, 9.7, line 2. Should be z_2 , not z_1 .

A27, 13.5c. Should have y^* on RHS.

A28, 10. RHS should be $\frac{\partial p(x,q)}{\partial q}x$.

A29, 14.17c. Replace $\frac{dx_1}{dt_1}$ by $\frac{dx_1}{dt_1}dt_1$ and same for t_2 . In last line of answer probably want dt_2 rather than t_2 .

A30, 14.23b, 3rd line and 14.23d, 4th line. Should be $(2-p)^2/2$, which makes the answer in 14.23d $p = 2(c+2)/3$. (Wes Wilson)

A31, 16.11. c should be k (3 times).

A33, 22.1. Omit equation number. Last paragraph should say “of this expression is nonpositive (and typically negative)”.

A35, line 6. Should be $u'(s)$.

A35, 25.5. Last displayed equation should have $s_i\pi_{ia}$.

Fixed for printing 2

Preface

xiii. delete “is” in last line of second paragraph. (Barbara Harrow) OK

xv. “Mauleg” should be “Malueg.” (David Malueg) OK

Chapter 1

4. 3rd line of “Transformation function.” Add the requirement that $\mathbf{y}' \neq \mathbf{y}$. (David Malueg) OK

5. Figure labels A and B omitted. (Richard Woodward) OK

6, 2nd display equation. Should be

$$V(y) = \{(y_A + 2y_B, y_B + 2y_A) : y = y_A + y_B\}.$$

(Hal Varian) OK

8. Figure 1.4. Replace “production” by “input requirement.” (David Malueg) OK

14, 4th equation. Write x_2/x_1 rather than x_1/x_2 . (Tevfik Aksoy) OK

15, third paragraph from bottom. Replace “simply” with “simple.” (David Malueg) OK

20. Part (3) of the proof. The numerator and denominator of the fraction got reversed. It should say

$$TRS = - \left(\frac{x_1}{x_2} \right)^{-\infty} = - \left(\frac{x_2}{x_1} \right)^{\infty}.$$

If $x_2 > x_1$ the TRS is (negative) infinity; if $x_2 < x_1$, the TRS is zero. (John Miller) OK

22. Problem 1.11d. The inequality should be reversed. (Richard Woodward) OK

Chapter 2

32. 5 from bottom. Remove "...that we have a strict maximum, so that..." (Ken Binmore) OK

Chapter 3

42, line 5. "important" is repeated twice. (John Miller) OK

44, 3rd equation on page. Use identity sign instead of equality. (John Miller) OK

45. 5 lines from bottom. "appendix" should be "Chapter 27." (Richard Woodward) OK

46, 5 from bottom. Should be $\partial^2\pi$. (Carl Simon) OK

Chapter 4

59. last equation on page. The last column of the matrix in the numerator should be $(0, -1, 0)$, with no bold zero. (Richard Woodward) OK

62. Space missing in definition of VO . (Carl Simon) OK

63 (A14). Answer to problem 4.5 should have $a_1w_1 + a_2w_2$ in first line and third line. OK

Chapter 5

71. Figure 5.2. Should have $AC(y^*, z^*)$ on vertical axis. (Gustavo Angeles) OK

73. Figure 5.4 is typeset poorly. (Richard Woodward) OK

78. Problem 5.5. Should ask for conditional factor demand. (Ken Binmore) OK

78 (A15). First line should have $c(w_1, w_2, y) = \min\{w_1, w_2\}y$. (Francisco Armando da Costa) OK

79, exercise 5.12. Omit "an." (David Malueg) OK

79, exercise 5.15. Should have $\{(x_1, x_2, x_3) : \dots$ Marcos Gallacher. OK

Chapter 6

87, 4th display equation. Put period in right place. (David Malueg) OK

91. Figures 6.3–6.6 should have w_1/w_2 on vertical axis rather than w_2/w_1 . Figure 6.4a and 6.6a should show the slope as $-w_1^*/w_2^*$. (Francisco Armando da Costa) OK

Chapter 7

97, 5 lines from bottom. Delete "marginal rate of substitution." (Tevfik Aksoy) OK

101, 5 from bottom: should have $\partial^2u(\mathbf{x})$ (Kevin Jackson) OK

104, caption to Figure 7.2. Eliminate)) on second line. (Kevin Jackson) OK

104, caption to Figure 7.3. "increase" should be "increases." (Kevin Jackson) OK

105, line 4. Replace $1, \dots, n$ by $1, \dots, k$. Also, immediately following this, "page 71" should be "page 72." (Zhiqi Chen) OK

106, Roy's identity. $i = 1, \dots, n$ should be $i = 1, \dots, k$. (V A Noronha) OK

108, equations (7.8) and (7.9). Upper limit should be k , not n . (V A Noronha) OK

109. Should probably say "...strictly increasing for continuous, locally nonsatiated preferences ..." (George Mailath) OK

112. Example. The suggested transformation is only valid if ρ is positive. This paragraph should probably be removed. (Soren Blomqvist) OK

114. Question 7.3. Ask for a *quasiconcave* utility function. Otherwise there are many other answers. (Gustavo Angeles.) OK

114. Question 7.5. Normalize $p_2 = 1$. In answer to 7.5c (page A17) should replace y by m . (Gustavo Angeles) OK

115. Question 7.6. One line from bottom. ($A($ should be $A(.$ (Gustavo Angeles) OK

Chapter 8

120, last expression on page. Should be $\partial x_1(\mathbf{p}, m)/\partial m$ (Mark Burkey) OK

123. Extra “)” in each of last two equations. (Gustavo Angeles) OK

123, 3rd line of middle paragraph. Should say “allows us” (Kevin Jackson) OK

126. Missing “)” in last equation. (Gustavo Angeles) OK

131. Third equation. Denominator should have x_2 rather than x_1 . (Richard Woodward) OK

132, line 14. Should have boldface x . (Carl Simon) OK

132, line 12 from bottom. Should have boldface x . (Carl Simon) OK

134, 3rd display equation. \mathbf{p} should be \mathbf{p}^s . (Attila Ratfai) OK

142, question 8.15. Should say “supply function of labor.” Answer on A20 should say “if leisure is inferior”. (Tevfik Aksoy) OK

143, second line from bottom. The word “on” is repeated twice. (Tevfik Aksoy) OK

Chapter 9

145. Displayed equations. Should have bold omegas in both equations. (Martin Osborne) Should probably use p_j and ω_j subscripts in first displayed equation. (Sjur Flam) OK

149, 2nd displayed equation. Should have capital V 's. (Ken Binmore) OK

157, Notes. Reference Bob Pollak with respect to conditional demand functions. OK

Chapter 10

162, middle of page. Chapter 9 should be chapter 8. OK

163, line 6 of 10.2. p^1 should be p' . (Alessandro Balestrino) OK

164, 3 lines from bottom. $v_1(p_1)$ should be $v(p_1)$. (Sjur Flam) OK

165, 5 lines from bottom. Omit subscript on $u(x_1)$ (Sjur Flam) OK

166, 6 lines from bottom. Should be $\mu(q; q, m)$. (Sjur Flam) OK

168, paragraph before section 10.6. The case depicted has $p^0 > p_1$, so all the areas are *positive*. The inequalities in the last sentence should be reversed. (Gustavo Angeles) OK

Chapter 11

174, assumption U1. Probably want $[0, 1]$ rather than $[0; 1]$. Also, on top of page 175. (Gustavo Angeles) OK

177, section 11.5, second paragraph, line 3. “greater” should be “less.” (Roy H. M. Sempel) OK

181, 8 from bottom. Should say that $\pi_A(\epsilon)$ is called the risk premium. (Jan Rutkowski) OK

183. 1st equation. Should be

$$\frac{A''}{A'} - \frac{B''}{B'}.$$

(Gustavo Angeles) OK

185, paragraph before “Risk Aversion”. “size” should be “side.” (Kevin Jackson) OK

186, 9 from bottom. Should be $(1+h)^2\sigma^2$. (Ken Binmore) OK

188, section 11.7, line 1. “he” should be “she” (Kevin Jackson) OK

189 Second equation should be $\bar{w} - b\bar{w}^2 - b\sigma_w^2$. (Francisco Armando da Costa) OK

189, 4 lines from bottom. $u(x)$ should be $u(w)$. (Gustavo Angeles) OK

189, last line. Expression in brackets is the negative of the correct expression and r^2 should be r . (Gustavo Angeles) OK

193, 2nd and 3rd display equations. The term multiplying $u(0)$ should be .01, not 1. (Hal Varian) OK

194, line 4. Replace = with >. (Attila Ratfai) OK

196, exercise 11.11. Utility function should be $-1/w$. (Zhiqi Chen) OK

Chapter 12

201, 2 lines above 12.5. Sum should equal 0. (Alessandro Balestrino)

209, last display equation. Should be w_j/w_i . (Attila Ratfai) OK

Chapter 13

224, 3 from bottom. upper limit on last sum should be m , not n . (Carl Simon) OK

225, last line. Take subscript off \bar{u}_2 . (Mariusz Shatba) OK

230, 13.3a. Should not have boldfaced w 's. (Carl Simon) OK

Chapter 14

234, 9 from top. Probably want $y = D(p)$. (Bo Li) OK

237, 1 up from bottom. “elastic” should be “inelastic.” (Ken Binmore) OK

240, 11 up. Remove first “of.” (Attila Ratfai) OK

240. last sentence: “be not” should be “not.” (Roy H. M. Sembel) OK

247, 14.18. Should have brackets around the last two terms. (Alessandro Balestrino)

248, Figure 14.3. The x_1 's should be x_l 's. (Ken Binmore) OK

252. Figure 14.5. Swap labels for (p_1, x_1) and (p_2, x_2) to be consistent with explanation in text. (Roy H. M. Sembel) OK

255, problem 14.15. Same as problem 14.21. (Yi Jiang) Answer should be

$$t = \frac{\tau kc}{1 - \tau}$$

where

$$k = \frac{1}{1 + \frac{1}{\epsilon}}$$

OK

257, problem 14.21. See page 255. (Yi Jiang) OK

261, line 3 from top, line 2 from bottom. Tables should be referenced directly. (Carl Simon) OK

Chapter 15

271, paragraph 2. $3/r$ should be $3 + 3/r$. The condition then becomes $3 + 3/r > 4 + 1/r$, which reduces to $r < 2$. (Bo Li) OK

272, section 15.8, 3rd line of 3rd paragraph. “belief” should be “believe” (Yhong Zhu) OK

272, 3rd line from bottom: eliminate one of the doubled “are” (Yhong Zhu) OK

274, line 3. Table 15.5 should be referred to directly. (Carl Simon) OK

276, 3 from bottom. Should say “B either accepts or comes back with a counteroffer.” (Carl Simon)

278, Figure 15.3. Change axes labels to u_A and u_B . (Yhong Zhu) OK

280, 8 lines from bottom. “lowest” should be “higher.” (V A Noronha) OK

282. Dasgupta misspelled here and on page A2. (V A Noronha) OK

283. (A30) Answer to problem 15.5 should be: Part (a): $a \geq e, c \geq g, b \geq d, f \geq h$. Part (b): $a \geq e, b \geq d$. (Francisco Armando da Costa) OK

283, 15.8. Middle strategy should have label “Middle”. (David Malueg) OK

Chapter 16

286, 5 from bottom. Should be $f'_1(y_2)$. (Sjur Flam) OK

287, Stability of the system, line 5. “it” should be “its”. (Lea Verdin Carty) OK

291, 1st equation. $W(Y) = [P(Y)-$ should be $W(Y) = [P(Y)Y-$. (Bo Li) OK

295, 3rd equation. b_2 should be b_1 . (Bo Li) OK

297, A1. Should say “strictly decreasing.” In theorem should say “(weakly) prefers.” (Giacomo Costa) OK

298, line 2. Last inequality should be a weak inequality. (Giacomo Costa) OK

298, 12 from bottom. Should have $g_2(p_1)$ in this expression. (Sjur Flam) OK

298, 4 from bottom. “firm 2” should be “firm 1.” (Bo Li) OK

300, last two paragraphs. This argument is correct for the case where the two firms are identical, but the diagram depicts curves with different marginal costs. (Hal Varian) OK

305, last paragraph. Profit functions here should all have subscripts of 2, not 1. (Sjur Flam) OK

306. Should have $\frac{\pi_2^*}{1-\delta}$ (Yi Jiang) OK

310, Notes. Add reference to Singh and Vives (1984), “Price and Quality Competition in a Differentiated Duopoly,” *Rand Journal of Economics*, 15: 546–554. OK

311, 16.7. Should be $y_1 > y_2$. (Bo Li) OK

Chapter 17

317, Figure 17.2. Switch the labels on consumer 1 and consumer 2’s offer curves. (Coenraad

Vrolijk) OK

317, Walras' law. Remove "in S^{k-1} " since the notation isn't introduced until the next page. (Hal Varian) OK

318, top line. Should say "aggregate excess demand." (Hal Varian) OK

318, line 4. x_i should be in boldface since it is a vector. (Hal Varian) OK

319, line 2. The zero in the statement of the proposition should be boldface. (Hal Varian) OK

322, first 2 lines of examples. $(x_1^1)_1^a$ should be $(x_1^1)^a$ and $(x_2^1)_1^b$ should be $(x_2^1)^b$. (Tevik Aksoy) OK

322, line 5 of example. m should be m_1 (Gustavo Angeles) OK

326. 5 lines from bottom: should say "... prefers to \mathbf{x}_1^* ." (Roy H. M. Sembel) OK

327, step 1. The zero should be boldface. (David Malueg) OK

334, equation in middle of page. The \mathbf{p} should be \mathbf{p}^* . (Marco Sandri) OK

336, Problem 17.1. $x'_i = x_i^*$ should be in boldface. (Yong Zhu) OK

337. Problem 17.9. Answer given in book is for p_2/p_1 . OK

337. Problem 17.11. Add endowments to statement of problem. OK

Chapter 18

339. 7 lines from bottom: n should be m . (Roy H. M. Sembel) OK

339. 7 from top. Should have boldfaced \mathbf{p} . (Hal Varian) OK

344. Assumption 8. n should be m , i should be j . (Roy H. M. Sembel) OK

344. Assumptions 7–9. Should be stated in terms of *aggregate* production set, not individual firms' production sets, to be consistent with *Theory of Value*. (John Kennan) OK

345, 3rd displayed equation. last summation index should be j not i . (Lea Verdin Carty) OK

346, item (2) in theorem. Should have $\mathbf{p}y_j^*$. (Tevfik Aksoy) OK

352, 6th displayed equation. Exponent is ugly. (Hal Varian) OK

353, 12 lines from bottom. W should be L . (Yong Zhu) OK

354, Nonsubstitution Theorem. Should say $i = 1, \dots, n$. (Jon Hamilton) OK

356. Change Samuelson (1966) to reference original piece. OK

Chapter 19

361, equation 19.6. Should have E in front. (Yong Zhu) OK

361, 2nd equation from bottom. Should have w_{T-2} on RHS, tilde over w_{T-1} on LHS. (Yong Zhu) OK

362, equation 19.7. Should have tilde over R . In next paragraph 19.5 should be 19.6 and 19.6 should be 19.8. Equation 19.9 should have an E in front of it. In 19.10, should have same denominator as in 19.9. Put tilde over R in last two equations. (Yong Zhu) OK

363, 1st equation. Replace $+$ by $-$. (Karen Eggleston)

363, equations 19.11 and 19.12. Put expectation sign in 19.11 and put tilde over R 's.

(Yong Zhu) OK

366, line 8. Eliminate “I.” (Hal Varian) OK

Chapter 20

376, 3rd paragraph, 3rd line: b_{ai} should be b_{ia} (Yong Zhu) OK

380, 7 lines from bottom. “price” should be “return.” OK

382, second equation RHS. Should have tilde over π . (Yong Zhu) OK

384, 3rd paragraph. Should say that $\rho_s \geq 0$. (Hal Varian) OK

384, 3rd equation from bottom. Should separate the bar over Z and V_a . (Yong Zhu) OK

Chapter 22

413, 22.2. Replace n by k . (Carl Simon) OK

Chapter 23

416, line 3. w_1 should be w_2 . (Roy H. M. Sempel) OK

419. Second equation in (23.3), second term, should be $\partial u_2 / \partial G$. (Francisco Armando da Costa) OK

420. In equation 23.8 and following equation arguments of utility function should be $(g_1 + g_2, x_1)$. (Francisco Armando da Costa) OK

421, Figure 23.1. One Panel A, g_1 should be $g_1 + g_2$. (Jon Hamilton) OK

423, lines 3–4. Inequalities should be reversed. (Francisco Armando da Costa) OK

423, line 7. Should have $u'_2(G)$ (Francisco Armando da Costa) OK

425, line 3. Should say “...derivative of the average utility function ...” (Francisco Armando da Costa) OK

426, 2nd display equation. Should have x_2^* as argument. (Carl Simon) OK

429. Change Samuelson to reference original article, not collected works. (Jon Hamilton) OK

Chapter 25

442, footnote. Should spell “monopsony” correctly. (Alessandro Balestrino)

443, 7 lines from bottom. Equation should be $F = x(b^*) - c(b^*) - \bar{u}$. (Frances Wooley) OK

452, 1st display equation. Lower limit on summation should be 1. (Carl Simon) OK

456, equations in middle of page. min should be max. (Bo Li) OK

458, 5 lines up from graph. Should say “prefer (s_2, x_2^*) to (s_1, x_1^*) .” (Bo Li) OK

462, line 2: Should be $2c'_2(x_2^*) = 1 + c'_1(x_2^*)$. line 3: “equal” should be “equals.” (Frances Wooley) OK

463, line 6. “high-cost” should be “low-cost” in this line. (Roy H. M. Sempel) OK

Chapter 26

474, 2 from bottom. Replace $|\mathbf{x}|$ with \mathbf{xx} . Add “of” to figure caption. (Mariusz Shatba) OK

481. In homogeneous functions section it should be $k = 0$ and $k = 1$, not $t = 0$ and $t = 1$. (Michael Sandfort) OK

Chapter 27

487, footnote. “that” should be “than.” (Hal Varian) OK

494, last 2 equations. The right-hand side of this equation should have minus signs in front of it. (Yong Zhu) OK

495, 6 lines down. “Negative” should be “positive.” (Yong Zhu) OK

495, 7 lines down. Omit “negative of the.” (Yong Zhu) OK

495. 2nd equation up. Omit both minus signs. (Yong Zhu) OK

495. 2nd equation of example. Should be $u'_2(x_2)$. (Gustavo Angeles) OK

496. Probably want to show that the partial derivatives are evaluated at (y_1, y_2) in 3rd and 4th expression. (Yong Zhu) OK

501, last paragraph. This repeats the example given immediately above, and should be deleted. (Yong Zhu) OK

503, 2nd line after equation 27.8, $g_i(\mathbf{x})$ should be $g_i(\mathbf{x}^*)$. (Marco Sandri) OK

503, equation for $G(\mathbf{x}^*)$. Should be “for all i such that $g_i(\mathbf{x}^*) = 0$. Should reword previous sentence since $B(x^*)$ is redundant with this definition. (Marco Sandri) OK

504. Should add multipliers to 27.9. (Yong Zhu) OK

504. The concluding paragraph of the proof is not correct as it stands. If the i^{th} constraint is not binding, $\lambda_i = 0$. If the i^{th} constraint is binding, then $g_i(\mathbf{x}^*) = 0$, so $g_i(\mathbf{x}) \leq g_i(\mathbf{x}^*) = 0$ and $\mathbf{D}g_i(\mathbf{x}^*)(\mathbf{x} - \mathbf{x}^*) \leq 0$. Applying these observations to equation (27.9) we see that $f(\mathbf{x}) \leq f(\mathbf{x}^*)$. (Jinku Lee)

505, 1st line of 2nd paragraph. “problem” should be “problems.” (Barbara Harrow) OK

References

A1. “Extremal” misspelled in first line. OK

A1-A7 (Bibliography) Muellbauer, Geanakoplos, and Scheinkman are misspelled. Pareto and Paretian should be capitalized in the Debreu entries. (Kim Border) OK

A2. Blackorby reference. Last word should be “Applications.” (Martin Osborne) OK

Answers

A10. Answer to 1.11c is wrong. Second derivative should be

$$\frac{1}{4}x_1^{-\frac{3}{2}}x_2^{\frac{1}{2}}$$

(Tevfik Aksoy) OK

A12. The answer to 2.7.f should say, “The derivative of profit with respect to w is $w/2 - 10$, which is, of course, the negative of the factor demand.” (Tevfik Aksoy) OK

A15. First line on page. $c(w_1, w_2, y) = \min\{w_1, w_2\}y$. Fourth line on page: replace “anything between 0 and y ” by “either 0 or y .” (Richard Woodward) OK

A15, 5.9b. Inequality should be reversed. (Yong Zhu) OK

- A15, 5c. Answer should be $p'(\alpha) = n[y + \alpha p/c'']/D'(p) < 0$. (Felix FitzRoy)
- A15, 5.13b. Put minus signs in duality relations. The last inequality should be reversed. (Yong Zhu) OK
- A17. Answer to 7.3. Budget constraint should have $p_1x_1 + p_2x_2 = m$. I also should say that the utility function is restricted to be quasiconcave. (Tevik Aksoy) OK
- A20. 8.15. Answer should say that *leisure* is inferior good so the leisure demand is negative and labor supply is positive. (Yi Jiang) OK
- A21, 9.1. Should have $x_j(\mathbf{p})m$ rather than $x_j(\mathbf{p}, m)$. (Gustavo Angeles) OK
- A24, 11.5a. At end of second line should have p , not p^j . (Yi Jiang) OK
- A28. 14.11. Change “never” to “always.” (Ken Binmore) OK
- A29. 14.17 Should have $2p'_2 + p''_2x_2 - c''_2$ in denominator. (Yi Jiang) OK
- A30. 15.5. See p. 283 above.
- A31, 17.1. The x 's in this answer should be boldface. (Yong Zhu) OK
- A32. 17.9. Should have $x_3^2/x_3^1 = 5/10 = 1/2$. Also, probably want to have boldface \mathbf{x}^* in problem. (Duhamel Marc) OK
- A32, 17.11c. Want to give endowments in statement of problem. (Yong Zhu) OK
- A32. 18.1a. Total demand for labor should be $15N$. (Tevfik Aksoy) OK
- A32. 18.1a, 2nd line from bottom. Should have $r \geq 0$. (Yong Zhu) OK
- A34, 24.1a, 2nd equation. $u_2(x_1, x_2)$ should be $u_2(x_2)$. (Yong Zhu) OK
- A40. There are two entries for nonlinear pricing, and two entries for quasilinear utility function that should be merged. (Martin Osborne)

Solutions manual

- 4.5. Should be a_1w_1 . (David W. Crawford) OK
- 4.6. Should be $2\sqrt{y}$. (David W. Crawford) OK
- 5.10. Should say “... first equality ...” (David W. Crawford) OK
- 5.12. Should probably be $x_i(\mathbf{w}, 1)y$. (David W. Crawford) OK
- 5.16b. Last line should have x_2 rather than x . (David W. Crawford) OK
- 5.16e. First equation. Missing right parenthesis. (David W. Crawford) OK
- 7.4a. Replace y by m . (David W. Crawford) OK
- 7.4b. Should be p_2 not $p + 2$. (Eric Rasmusen)
- 7.5a. Quasilinear preferences are not defined until later. (David W. Crawford)
- 7.5b. Answer should be $p_1 < u(1) - p_2$. (David W. Crawford) OK
- 7.5c. Replace y by m . Answer should be

$$v(p_1, p_2, m) = \max\{m/p_2, u(1) + (m - p_1)/p_2\}$$

- (I assumed $p_2 = 1$.) (David W. Crawford) OK
- 8.4. Solution reverses p and q . (David W. Crawford) OK
- 8.16c Should have $) / 4$ not $) 4$. (Eric Rasmusen)

17.4. Should add final solution $p_2 = \frac{1-a}{a}$, $x_1^a = 1 - a$, $x_2^a = 1 - a$, $x_1^b = a$, $x_2^b = a$ (Eric Rasmusen)

Errata in first printing

7. The figure label on the right-hand side of the page should be eliminated.

30. The second order condition should be

$$pa(a - 1)x^{a-2} \leq 0.$$

(Jim Swanson) FIXED

112. In discussion of CES utility function we should have $r = \rho/(\rho - 1)$. (John Nachbar) FIXED

116 Engle should be Engel. (John Kennan) FIXED

148. Third equation on page should have $X(f(\mathbf{p}), \mathbf{q}, m)$ in middle. FIXED

163. Prices have superscripts in diagram label, but subscripts in diagram. FIXED

191. Next to last paragraph should say: "... is true, *and* that E is an event ..." FIXED

195. Problem 11 (d) should say: "Let w_0 be the amount of money that would give you the same utility you would have if you played this game. Solve for w_0 ." The answer in the back of the book should then be changed to $w_0 = e^{\ln(2)/p}$. (Jim Andreoni) FIXED

203. First line: "as" should be "a". FIXED

217. Figure label on wrong side of page. FIXED

223. Figure label on wrong side of page. FIXED

300. Second equation and text following should be:

$$\text{sign } g'_2(p_1) = \text{sign} \left[p_2 \frac{\partial^2 x_2}{\partial p_1 \partial p_2} + \frac{\partial x_2}{\partial p_1} \right].$$

The first term may be positive or negative, but if the two goods are substitutes the sign of the second term will be positive. Hence, as noted earlier, we might well expect *upward* sloping reaction curves in the price-leadership model. FIXED

319. Figure label on wrong side of page. FIXED

337. In problem 17.10, we should have $\mathbf{p} \geq 0$. (David Kiefer)

344. In assumptions 7, 8, and 9 the firm production sets should actually be the aggregate production set. (John Kennan)

402. Orphan line at end of page. FIXED

443, equation (25.2). Should have $c(a)$, not $c(x(a))$. (Francisco Armando da Costa)

449–51 The geometry of the moral hazard problem described here is wrong. Since $\pi_{1a} + \pi_{2a} = \pi_{1b} + \pi_{2b} = 1$, the slope of the line in (25.10) (the incentive compatibility constraint) should be 1. This should be corrected in Figures 25.1 and 25.2. The last sentence on page 449 should read "The nature to the solution to the principal agent problem depends on whether the incentive compatibility line intersects the vertical or the horizontal axis." (Rachel Kranton) FIXED

451. First equations referenced should be (25.6–25.7) and $-\bar{u}$ should be $+\bar{u}$. (Ed Zajac)
FIXED

471. First equation on page should be

$$\frac{v_2 - v_1}{c_2} > e^* > \frac{v_2 - v_1}{c_1}$$

(Bill Sjostrom) FIXED

476. In last full paragraph on page “give” should be “given.” Also border is on lower-right hand side here, but upper left-hand side on page 499. This is equivalent, but I should be consistent. FIXED

479. Should have boldfaced x 's in Jacobian matrix. FIXED

480. Fourth line, last derivative should be $\mathbf{D}f(\mathbf{x})$. FIXED

A5. Nash, J. (1951) should be volume 54, not 44. Nash, J. (1954) should be Nash, J. (1950) and “states” should be “points.” (John Kennan).