ERRATA (first printing)
Probability and Finance: It's Only a Game!

Glenn Shafer and Vladimir Vovk

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This document lists all errors in the book that are corrected in the second printing (we thank Pablo Ignacio Fierens for pointing out some of them). See also Errata for the second printing, available from www.probabilityand-finance.com.

p. 14, last line of second paragraph: There is a space missing between "(game-theoretic)" and "*variance*".

p. 16, body of Figure 1.5: "$\mathbb{P}\{E\}$" $\mapsto$ "$\underline{\mathbb{P}}\{E\}$" (four times); actually the underline is there, but it is too pale.

p. 21, next-to-last line of second paragraph: "An individual might peers odds" $\mapsto$ "An individual might offer peers odds".

p. 41, second line of first bullet: Delete the left parenthesis.

p. 49, line 16 from bottom: "in any given countable number of subsequences" $\mapsto$ "in the subsequences selected by any given countable number of subsequence selection rules"

p. 51, line before displayed formula: "nth bet" $\mapsto$ "$(n+1)$st round"

p. 52, line after Eq. (2.9): "$\mathcal{L}$ is its value" $\mapsto$ "$\mathcal{L}_n$ is its value"; "all martingales" $\mapsto$ "all nonnegative martingales"

p. 58, line 8 from the bottom: "have have" $\mapsto$ "have"

p. 65, first two lines: "hold the average at zero" $\mapsto$ "hold the average asymptotically at zero"

p. 71, line 16: "continues" $\mapsto$ "continue"

p. 72, first full paragraph: "$\sum_{i=1}^{n} x_i$" $\mapsto$ "$\frac{1}{n}\sum_{i=1}^{n} x_i$"

p. 74, last paragraph: "Schnorr (1970, 1971)" $\mapsto$ "Schnorr [268, 269]"

p. 76, line 5 of first full paragraph: Delete "only".

p. 82, first line of proof: "S^k" $\mapsto$ "$\mathcal{S}^k$"

p. 84, second displayed formula: "$\mathcal{M}^k(s)x + \mathcal{V}^k(s)(x^2 - v)$" $\mapsto$ "$\mathcal{M}^k(sv)x + \mathcal{V}^k(sv)(x^2 - v)$"

p. 90, line 6 from bottom: "if the goal happens and he performs his collateral duty" $\mapsto$ "if he performs his collateral duty and either the goal happens or Reality fails to perform her collateral duty"

p. 92, second line: "p. 171" $\mapsto$ "p. 172"

p. 92, first line of the proof: "$\mathcal{S} = \mathcal{K}^{\mathcal{P}_1}$" $\mapsto$ "$\mathcal{S} = \mathcal{S}_0 + \mathcal{K}^{\mathcal{P}_1}$"

p. 93, last displayed equation: "sar" $\mapsto$ "sfr"

p. 94, fifth line: After the word "series", there should be a number referring to the formula that is displayed between the formulas now numbered (4.10) and (4.11) on p. 83.

p. 95, body of Figure 4.1: In the game tree on the left, there is a horizontal line that is nearly invisible. It should extend from the southeastly X to the circled I to its east.

p. 98, line 4 from bottom: "AC" $\mapsto$ "the axiom of choice"

p. 100, first bullet, line before (5.5): "$|\sum_{i=1}^{n}(x_i - m_i)|$" $\mapsto$ "$\sum_{i=1}^{n}(x_i - m_i)$"

p. 100, first bullet, line after (5.5): "between $-(1 + \epsilon)$ and" $\mapsto$ "below"

p. 100, second line of second bullet: Delete "both -1 and".

p. 105, Equation (5.11), and p. 106, top displayed equation: "$\mathcal{K}_{i+1}^{(\kappa)} := \mathcal{K}_i^{(\kappa)}$" $\mapsto$ "$\mathcal{K}_i^{(\kappa)} := \mathcal{K}_{i-1}^{(\kappa)}$"

p. 106, Equations (5.12) and (5.13): "$\mathcal{K}_i^{(\kappa)}$" $\mapsto$ "$\mathcal{K}_{i-1}^{(\kappa)}$"

p. 106, line after (5.13): "step" $\mapsto$ "round"

p. 109, displayed formula on line 8: "$\mathcal{L}(\square) = 1$ and" is part of the preceding text rather than part of the displayed formula.

p. 110, first two displayed formulas in proof: In each case, "when (5.32) holds." should be in the displayed formula rather than the following text.

p. 110, second line before (5.35): "number" $\mapsto$ "sequence"

p. 110, third line after (5.35): "at this situation" $\mapsto$ "in this situation"

p. 117, third line: "next paragraph" $\mapsto$ "next subsection"

p. 121, first line after (6.2): Delete "sufficiently".

p. 122, fifth line after (6.4): "all of which" $\mapsto$ "the most interesting of which"

p. 125, third and fourth lines after the proof: Delete "nonnegative" in both lines. Replace $\mathcal{S}_n - n$ by $\mathcal{S}_n^2 - n$.

p. 125, sixth line after the proof: Replace $\mathcal{S}_n - n$ by $\mathcal{S}_n^2 - n$.

p. 125, second line from bottom: "$\mathcal{K}_0 := 1$." $\mapsto$ "$\mathcal{K}_0 := \alpha$."

p. 127, line 4: "a positive initial capital $\mathcal{K}_0$ for Skeptic," $\mapsto$ "an initial capital $\mathcal{K}_0$ for Skeptic, not necessarily positive"

p. 127, line 7: "**Parameters:** $N, \mathcal{K}_0 > 0$" $\mapsto$ "**Parameters:** $N, \mathcal{K}_0$"

p. 128, first line of Table 6.1: "$\frac{0.02}{\sqrt{N}}$" $\mapsto$ "$\frac{0.005}{\sqrt{N}}$"

p. 128, second line of Table 6.1: "$\frac{6}{\sqrt{N}}$" $\mapsto$ "$\frac{1.5}{\sqrt{N}}$"

p. 129, line 3: "$U(s)$" $\mapsto$ "$U(s_0)$"

p. 129, line 4: "$S \to s$" $\mapsto$ "$s \to s_0$"

p. 132, last line before footnote: "be at most" $\mapsto$ "will be at most"

p. 133, line 10: "**Parameters:** $N, \mathcal{K}_0 > 0$" $\mapsto$ "**Parameters:** $N, \mathcal{K}_0$"

p. 133, fourth line after protocol: "$\sum_{n=1}^{N} x_n$" $\mapsto$ "$\frac{1}{N} \sum_{n=1}^{N} x_n$"

p. 133, line 2 from bottom: "$\lim_{n \to \infty}$" $\mapsto$ "$\lim_{N \to \infty}$"

p. 134, first line of the caption of Table 6.2: "central limit" $\mapsto$ "central limit theorem"

p. 135, first line of paragraph with displayed formulas: "$\lim_{n \to \infty}$" $\mapsto$ "$\lim_{N \to \infty}$"

p. 137, definition containing bullet points: this definition should be given for domains in $\mathbb{R}^2$ more general than $\mathbb{R} \times (0, \infty)$ (as in Doob, 1984),

since **Approximation Theorem on p. 139** asserts that the functions A_δ, which are defined only on part of $\mathbb{R} \times (0, \infty)$, are superparabolic. On **line 3 of p. 139**, the function u should be allowed to be defined on part of $\mathbb{R} \times (0, \infty)$. Only the "cleaner argument" for $\mathrm{LM}\, u$ being nondecreasing in D (described at the **bottom of p. 139 and top of p. 140**) should be left. (The main argument is correct but less intuitive.)

p. 140, line after second unnumbered displayed formula: "where $\tilde{u}(s) := u(s + s_1 - s_2)$" $\mapsto$ "where $\tilde{u}(s, D) := u(s + s_1 - s_2, D)$"; "time rather space" $\mapsto$ "time rather than space"

p. 141, line 14: "moves of $\mathcal{S}_n$" $\mapsto$ "moves of $U(\mathcal{S}_n)$"

p. 142, line 1: "$< \epsilon^2$" $\mapsto$ "$\leq \epsilon^2$"

p. 142, line 4 of the proof: "interval" $\mapsto$ "rectangle"

p. 142, line 7 from end of the proof: "are bounded)" $\mapsto$ "are bounded inside $\{(s, D) \mid \mathrm{LM}\, u - u \geq \epsilon/2, D \in [0, 1], s \in [-C, C]\})$"

p. 142, heading: "Indicator functions" $\mapsto$ "Indicator Functions"

p. 143, heading: "Convex functions" $\mapsto$ "Convex Functions"

p. 145, line 1: "N" $\mapsto$ "$\lfloor N\tau \rfloor$"

p. 145, first line of second full bullet: "proved that for convex" $\mapsto$ "proved that for certain convex"

p. 145, fourth line from bottom: "interpretation of differential" $\mapsto$ "interpretation of partial differential"

p. 147, end of the second paragraph: "In this context, Lindeberg's condition requires that extreme values for the increments of a martingale have small game-theoretic upper probability, and the theorem concludes that the price of any well-behaved function of the final value of the martingale is given by the integral of the function with respect to the standard Gaussian distribution." $\mapsto$ "In this context, Lindeberg's condition requires that extreme values for the increments of a martingale have small upper probability. If a martingale satisfies this and other conditions, well-behaved functions of its final value can be approximately priced by integration with respect to the standard Gaussian distribution."

p. 152, line 2: "**r** is a martingale" $\mapsto$ "the process identically equal to r is a martingale"

p. 152, third full paragraph, line 1: "defineits" $\mapsto$ "define its"

p. 156, bottom half of page: "∂S" $\mapsto$ "∂s" (three times)

p. 159, line 6: "**Parameters:** $N, A \geq 1, \mathcal{K}_0 > 0$" $\mapsto$ "**Parameters:** $N, A \geq 1, \mathcal{K}_0$"

p. 160, line 1: "**Parameters:** $N, A \geq 1, \sigma^2 \geq 0, \mathcal{K}_0 > 0$" $\mapsto$ "**Parameters:** $N, A \geq 1, \sigma^2 > 0, \mathcal{K}_0$"

p. 160, line 8: "$V_n(x_n^2 - \sigma^2/N)$" $\mapsto$ "$V_n((x_n - m_n)^2 - \sigma^2/N)$"

p. 160, line 9: "$\mathcal{S}$" $\mapsto$ "$\mathcal{S}_N$"

p. 160, line 5 of Example 2: "$\mathcal{K}_0 > 0$" $\mapsto$ "$\mathcal{K}_0$"

p. 161, line 5 of Example 3: "$\sigma^2 > 0, \mathcal{K}_0 > 0$" $\mapsto$ "$\sigma^2 > 0, \mathcal{K}_0$"

p. 161, line 12 from bottom: "her" $\mapsto$ "his"

p. 161, line 3 from bottom: Delete "of".

p. 161, last line: Delete "this time".

p. 162, line 8: Delete "upper".

p. 162, line 11: "$\mathcal{K}_0 > 0$" $\mapsto$ "$\mathcal{K}_0$"

p. 162, first line after corollary: "Lindeberg's Theorem" $\mapsto$ "Lindeberg's theorem"

p. 162, displayed formula: "$|x_n|^2 \, \mathbb{I}_{x_n^2 \geq \delta} \leq \delta^{-1/2}|x_n|^3$." $\mapsto$ "$x_n^2 \, \mathbb{I}_{|x_n| \geq \delta} \leq \delta^{-1}|x_n|^3$."

p. 163, line 5: "the his average" $\mapsto$ "his average"

p. 163, line 9 from bottom: "**Parameters:** $C > 0, \mathcal{K}_0 > 0$" $\mapsto$ "**Parameters:** $C > 0, \mathcal{K}_0$"

p. 164, line 5: "$p_n = 1/2$" $\mapsto$ "$p_n := 1/2$"

p. 164, lines 6 and 5 from the end of §7.3: "The squared gain $\frac{1}{C}(x_i - p_i)^2$ never exceeds $1/C$. So, provided C is big enough, the inequality $\frac{1}{C}(x_i - p_i)^2 \geq \delta$ is ruled out" $\mapsto$ "The absolute gain $\frac{1}{\sqrt{C}}|x_i - p_i|$ never exceeds $1/\sqrt{C}$. So, provided C is big enough, the inequality $\frac{1}{\sqrt{C}}|x_i - p_i| \geq \delta$ is ruled out"

p. 169, line 8 of Filtrations and Measure-Theoretic Martingales: "$\mathcal{F}_0 \subseteq \mathcal{F}_1 \subseteq \ldots$." $\mapsto$ "$\mathcal{F}_0 \subseteq \mathcal{F}_1 \subseteq \ldots \subseteq \mathcal{F}$."

p. 173, first line after Corollary 8.3: Delete "the sharpness part of".

p. 173, line 5 from bottom: "$\mathcal{V}_0 \ldots, \mathcal{V}_{n-1}$" $\mapsto$ "$\mathcal{V}_0, \ldots, \mathcal{V}_{n-1}$"

p. 174, the displayed formula after (8.6): "$d\mathcal{V}_n(\omega) = d_{t_n(\omega)}\mathcal{V}$." $\mapsto$ "$d\mathcal{V}_n(\omega) = d_{t_n(\omega)}\mathcal{V}(\omega)$."

p. 174, line 3 from bottom: "martingale" $\mapsto$ "process"

p. 175, line 8: "martingale" $\mapsto$ "process"

p. 175, next to last line of Proposition 8.4: "$\mathcal{A}, \mathcal{B}, \mathcal{C}$ and $\mathcal{U}$" $\mapsto$ "$\mathcal{A}, \mathcal{B}, \mathcal{C},$ and $\mathcal{U}$"

p. 176, line 5 of proof: "$\mathcal{W}_0$" $\mapsto$ "$\mathbb{E}\,\mathcal{W}_0$"

pp. 176–177, paragraph straddling these two pages: If $\mathcal{W}_0$ is not a constant, add round $n = -1$ to the Lindeberg protocol (with $\mathcal{W}_{-1} := \mathbb{E}\,\mathcal{W}_0 < \delta$ a constant).

p. 177, last line of proof: "Ville's theorem" $\mapsto$ "Theorem 10.10 in [347]"

p. 178, line 1: "This is identical" $\mapsto$ "This is almost identical"; "p. 162" $\mapsto$ "p. 163"

p. 179, second line of Proposition 8.5: "$(\mathbb{P}, \{0,1\}^\infty, \mathcal{C}, \{\mathcal{C}_n\}_{n=0}^\infty)$" $\mapsto$ "$(\{0,1\}^\infty, \mathcal{C}, \{\mathcal{C}_n\}_{n=0}^\infty, \mathbb{P})$"

p. 182, next to last line: "This is the one of" $\mapsto$ "This is one of"

p. 183, line 1: "in contrast, with" $\mapsto$ "in contrast with"

p. 184, fourth line after Eq. (8.25): "x.)" $\mapsto$ "t.)"

p. 190, second line of the fourth bullet: "i_n" $\mapsto$ "i_1"

p. 191, first line of Corollary 8.5: "bounded by some" $\mapsto$ "bounded in absolute value by some"

p. 195, line 6 of first proof: "arbitrary version" $\mapsto$ "arbitrary nonnegative version"

p. 195, last line of Proposition 8.13: "over measure-theoretic martingales" $\mapsto$ "over nonnegative measure-theoretic martingales"

p. 196, first displayed equation: $\mathbb{P}\{E\} \mapsto \mathbb{P}\,E$

p. 196, lines 8–10: Remove "By (8.1),... measure zero, and so".

p. 196, second item in Proposition 8.14: "then then" $\mapsto$ "then"

p. 197, next to last line of §8.5: "measure-theoretic martingale" $\mapsto$ "nonnegative measure-theoretic martingale"

p. 199, line 7 from bottom: "estimated variance" $\mapsto$ "variance, assumed known"

p. 199, bottom line: Delete "estimated".

p. 200, line 13 from bottom: Delete "highly".

p. 203, line 8 from bottom: "Speculation" $\mapsto$ "Spéculation"

p. 204, line 3: "A important" $\mapsto$ "An important"

p. 205, first line in caption of Figure 9.2: "Each of the 600 steps in this graph are" $\mapsto$ "Each of the 600 steps in this graph is"

p. 206, second line after (9.2): "a infinitely" $\mapsto$ "an infinitely"

p. 207, line 11 from bottom: Remove "(the average daily change...price)".

p. 207, line 10 from bottom: "0.0197, (the" $\mapsto$ "0.0197 (the"

p. 210, line 4: "$|x_n| < 1$" $\mapsto$ "$0 < |x_n| < 1$"

p. 210, line 5: "$\lim_{p \to 0} \mathbf{var}_{S,N}(0) = N$" $\mapsto$ "$\lim_{p \to 0} \mathbf{var}_{S,N}(p) = N$"

p. 210, line 3 of second paragraph: Remove "so that $\mathbf{var}_N(2)$ is small—or at least".

p. 210, line 6 of second paragraph: "is approximated" $\mapsto$ "are approximated"

p. 210, line 7 of second paragraph: "$K\delta$" $\mapsto$ "$K\delta^{1/4}$"

p. 211, line 9 from bottom: "that that" $\mapsto$ "that"

p. 211, line 4 from bottom: "diffusion processes" $\mapsto$ "diffusion processes with $\sigma > 0$"

p. 214, line 7 of second paragraph: "$\mathbf{var}_N(p) = 2$" $\mapsto$ "$\mathbb{E}\,\mathbf{var}_N(2) = 1$"

p. 214, bottom line: "derivative security" $\mapsto$ "derivative security $\mathcal{D}$"

p. 215, line 6: "S" $\mapsto$ "$\mathcal{S}$"

p. 216, lines 7–8 of the subsection "European Options": "but the easiest derivatives to study are the *European options*, whose payoffs" $\mapsto$ "but *European options* are relatively simple; their payoffs"

p. 218, line 1 of item 2 in the list: "Variance proportional to price" $\mapsto$ "Standard deviation proportional to price"

p. 218, line 1 of item 3 in the list: "to use of" $\mapsto$ "to use"

p. 224, line 3 from bottom: "$\sigma^2 dt$" $\mapsto$ "$\sigma^2 dt + \mu(dt)^2 \approx \sigma^2 dt$"

p. 228, top line of Game-Theoretic Efficiency: Remove the extra space between "game-theoretic" and "efficient-market".

p. 229, line 10: "of one of them" $\mapsto$ "one of them"

p. 229, line 5 of §9.5: "S" $\mapsto$ "$\mathcal{S}$"

p. 229, line 6 from bottom: "the the" $\mapsto$ "the"

p. 233, line 8 from bottom: Remove "the game be coherent:"

p. 233, line 7 from bottom: "are never all positive or all negative" $\mapsto$ "are never all nonpositive or all nonnegative, unless all are zero"

p. 233, line 4 from bottom: Add "and in no situation $dS \equiv 0$" after "is always binary".

p. 235, first displayed equation: "$+$" $\mapsto$ "$-$"

p. 236, top line: "$\alpha = e^{-(\beta^2/2)dt}$" $\mapsto$ "$\alpha \approx e^{-(\beta^2/2)dt}$"

p. 236, line 3: "becomes zero" $\mapsto$ "becomes (close to) zero"

p. 239, line 8 from bottom; p. 240, line 13; p. 241, line 5: "$\mathcal{K}_0 > 0$" $\mapsto$ "$\mathcal{K}_0$"

p. 241, line 6 from bottom: "$\mathcal{I}_0 > 0$" $\mapsto$ "$\mathcal{I}_0$"

p. 242, line 2 of the proof: "$\int U(z)\,\mathcal{N}_{0,D_0}(dz)$" $\mapsto$ "$\int U(z)\,\mathcal{N}_{S_0,D_0}(dz)$"

p. 243, line 4: Replace the first addend "$C^{1.5}N^{-1.5}$" by "$C^3 N^{-1.5}$"

p. 245, line 4 after Equation (10.12): "$\|U^{(3)}\|$ and $\|U^{(4)}\|$" $\mapsto$ "$U^{(3)}$ and $U^{(4)}$"

p. 249, line 3 from bottom: "$10e^{5C}\delta^{1/4}$" $\mapsto$ "$8e^{5C}\delta^{1/4}$"

p. 258, line 5 above the title "The Accuracy of Stochastic Hedging": "0.04" $\mapsto$ "0.01"

p. 259, displayed equation above Equation (10.53): "$\sum_t$" $\mapsto$ "$\sum_n$", "$S(t + dt)$" $\mapsto$ "S_{n+1}", "$S(t)$" $\mapsto$ "S_n" (twice)

p. 259, line 2 after Equation (10.53): "$\|S\|_\infty^{2+\epsilon}$" $\mapsto$ "$\|S\|^{2+\epsilon}$"

p. 262, heading: "The American Data, using" $\mapsto$ "The American Data, Using"

p. 264, heading: "The British Data, using" $\mapsto$ "The British Data, Using"

pp. 266–267, first line of the caption in Figures 10.13–10.15: the variation spectrum is relative in the case of S.

p. 266, first line of the second full paragraph: variation is relative in the case of S.

p. 266, line 6 from bottom: "3-variation" $\mapsto$ "relative 3-variation"

p. 268, line 3 from bottom: "the addends in the second sum" $\mapsto$ "the addends (with the vertical lines ignored) in the second sum"

p. 272, line 5 of the 2nd full paragraph: "all the real numbers" $\mapsto$ "many (but not all) real numbers"

p. 273, line 12: "her $S(t)$" $\mapsto$ "his $S(t)$"

p. 273, line 5 above §11.1: "§11.6." $\mapsto$ "§11.6,"

p. 273, penultimate line: "is standard" $\mapsto$ "is standard and 'well-behaved' (e.g., is continuous from the right)"

p. 274, first line of Lemma 11.1: "function, on $\mathbb{T}$" $\mapsto$ "function on $\mathbb{T}$"

p. 274, first line of the penultimate paragraph: "vex $f = 1$" $\mapsto$ "$\mathbf{var}_f(1) < \infty$"

p. 274, third line of the penultimate paragraph: Remove "and not infinitesimal".

p. 275, line 7: $df(t)/f(t) \mapsto |df(t)/f(t)|$

p. 277, last line of the second paragraph: Remove "This is equivalent…infinitesimal."

p. 277, lines 4 and 6 from bottom: "$\mathcal{M}-\mathcal{M}', \mathcal{V}-\mathcal{V}'$" $\mapsto$ "$\mathcal{M}'-\mathcal{M}, \mathcal{V}'-\mathcal{V}$"

p. 278, line 2: Remove "process".

p. 279, first line after Equation (11.10): "$0 < t < T$" $\mapsto$ "$0 \leq t \leq T$"

p. 279, third and fourth lines after Equation (11.10): "$p := 1+\epsilon$ and $q := 1-\epsilon$" $\mapsto$ "$p := 2+\epsilon$ and $q := 2-\epsilon$"

p. 280, second line of the proof, lines 10 and 11 from bottom: "$U^{(1)}-U^{(4)}$" $\mapsto$ "$U^{(2)}-U^{(4)}$"

p. 280, line after Equation (11.14): "$\overline{U}(S,D)$" $\mapsto$ "$\overline{U}(s,D)$"

p. 280, line 8 from bottom: Replace the reference to (11.14) by

$$\left| \int_{\mathbb{R}} U(S(0)e^z) \, \mathcal{N}_{-D(0)/2,\, D(0)}(dz) + \mathcal{I}^{\mathcal{M},\mathcal{V}}(S,D) - U(S(T)) \right| < \epsilon.$$

p. 280, the displayed equation at the bottom: "inf" $\mapsto$ "sup"

p. 281, line 4 from bottom: "done in the proof" $\mapsto$ "done this in the proof"

p. 282, first line of "Black-Scholes with the Relative Variation Spectrum": Remove "Therefore,".

p. 284, line 6: "$a,b \in {}^*\mathbb{R}$" $\mapsto$ "hyperreals a,b" (${}^*\mathbb{R}$ is not yet defined at this point)

p. 284, paragraph 5, last line: "$a < C$" $\mapsto$ "$|a| < C$"

p. 284, paragraph 6, first line: "every hyperreal" $\mapsto$ "every finite hyperreal"

p. 284, paragraph 6, second line: "$a \approx b$" $\mapsto$ "$a \approx \mathrm{st}(a)$"

p. 285, displayed equation at the bottom: "c" $\mapsto$ "p"

p. 287, line 1: "variation exponent" $\mapsto$ "2-variation"

p. 287, line 2: "2-variation" $\mapsto$ "quadratic variation"

p. 288, displayed equation before Proposition 11.6: "$=$" $\mapsto$ "$\approx$" (twice); **next line:** remove the comma after "result".

p. 291, line 3: "a standard set Z" $\mapsto$ "${}^*Z$, where Z is a standard set,"

p. 291, line 5: "Z" $\mapsto$ "${}^*Z$"

p. 291, line 3 of the first full paragraph after Saturation Theorem: "X" $\mapsto$ "${}^*X$"

p. 291, displayed equation at the bottom: "$j_1, \ldots, j_{N^{(k)}}$" $\mapsto$ "$j_0, j_1, \ldots, j_{N^{(k)}}$"

p. 296, line 6: "$S_n \in \mathbb{R}$" $\mapsto$ "$S_n > 0$"

p. 296, line 9: these constraints should be imposed on $S_n^\dagger$ and $D_n^\dagger$ rather than S_n and D_n themselves.

p. 296, line 3 after the protocol: "third line" $\mapsto$ "second line"

p. 296, line 3 from bottom: "Theorem 10.3" $\mapsto$ "Proposition 10.3"

p. 299, line 2 in subsection "Black-Scholes with the Square": "price" $\mapsto$ "price of"

p. 299, Equation (12.6): "$\mathcal{S}(t)$" $\mapsto$ "$S(t)$"

p. 301, line after Equation (12.16): "(12.13)" $\mapsto$ "(12.13) and the displayed equation following (12.13)"

p. 305, line after Equation (12.26): "equation (12.24)" $\mapsto$ "Equation (12.24)"

p. 307, Additional Constraints on Reality and Market: it should be mentioned that $k = 1, 2$.

p. 309, line before the first full paragraph: "two inequalities" $\mapsto$ "two chains of equalities"

p. 310, line 3 from bottom: "$x_n^{(-1)}$" $\mapsto$ "$\left| x_n^{(-1)} \right|$"

p. 311, line 3 of Stable Distributions: "[134] .)" $\mapsto$ "[134].)"

p. 312, line 2: "a and b ranging over the reals" $\mapsto$ "where X is distributed as P and a and b range over the reals"

p. 312, Equation (12.33): "$+ \frac{1}{2}\sigma^2 u^2$" $\mapsto$ "$- \frac{1}{2}\sigma^2 u^2$"

p. 313, second displayed equation in Khinchin's theorem: "X_{nk}" $\mapsto$ "$|X_{nk}|$"

p. 313, line 6 after Khinchin's theorem: "$\sigma^2 = c$" $\mapsto$ "$\frac{1}{2}\sigma^2 = c$"

p. 313, subsection "Lévy Processes": it should be mentioned that it is assumed here, without loss of generality, that $X(0) = 0$

p. 313, line 2 of subsection "Lévy Processes": "and independent" $\mapsto$ "are independent"

p. 314, the displayed equation in item 2 of the list: "$\frac{1}{2}\sigma^2 u^2$" $\mapsto$ "$-\frac{1}{2}\sigma^2 u^2$"

p. 318, bottom line: "in the next section" $\mapsto$ "in §13.3"

p. 320, line 11 from bottom: "U" $\mapsto$ "$\underline{U}$"

p. 322, second displayed equation: there should be an extra closing parenthesis before the period.

p. 322, line 15 from bottom: "Instruments" $\mapsto$ "Instrument"

p. 322, line 13 from bottom: "**Parameters**" $\mapsto$ "**Parameter**"

p. 327, line 2 in the description of the game: Remove " $\times \mathbf{B}^N$"

p. 329, first line of the proof: "weakly replicates H" $\mapsto$ "weakly super-replicates $\mathcal{U}$"

p. 329, line 3 of the proof: "$\mathcal{S}$ alone" $\mapsto$ "$\mathcal{S}$ and $\mathcal{D}$"

p. 329, line 4 of the proof: "$\underline{\mathbb{E}}$" $\mapsto$ "$\overline{\underline{\mathbb{E}}}$" (twice)

p. 329, line 5 of the proof: "H weakly replicates" $\mapsto$ "$\mathcal{U}$ weakly super-replicates"

p. 329, line 7 of the proof: "$\mathcal{S}$ alone" $\mapsto$ "$\mathcal{S}$ and $\mathcal{D}$"

p. 329, line 8 of the proof: "$\overline{\underline{\mathbb{E}}}$" $\mapsto$ "$\underline{\mathbb{E}}$" (twice)

p. 330, line 3 from bottom: "in the second game" $\mapsto$ "in the second game (maybe with c replaced by $c - \epsilon$ or $c + \epsilon$, as appropriate)"

p. 332, first item in the itemized list: "that interval" $\mapsto$ "the interval $[2/c, c/2]$"

p. 333, the left-hand side of Equation (13.5): "D_n" $\mapsto$ "$D_n + \delta$"

p. 333, lines 8 and 6 from bottom: "$\mathcal{D}$" $\mapsto$ "$\tilde{\mathcal{D}}$"

p. 333, lines 7 and 2 from bottom: "p. 138" $\mapsto$ "p. 142"

p. 334, line 5 from bottom: "$D(0) < \alpha$" $\mapsto$ "$S(0) < \alpha$"

p. 336, last line of the first full paragraph; p. 344, line 5 of §14.3: Remove "infinitely" (our formal definition involves becoming arbitrarily rich rather than infinitely rich).

p. 338, Equation (14.4): "σ" $\mapsto$ "σ^2"

p. 339, first line of Proposition 14.1: "in one of our diffusion protocols" $\mapsto$ "in Diffusion Protocols 1 or 2"

p. 340, fourth line above §14.2: "that that" $\mapsto$ "that"

p. 344, second line of Black-Scholes Diffusion Protocol 1: c should not be a parameter of the protocol (in the definition of the almost sure price

in the last paragraph of this page, c can depend on S_0); there are several obvious ways to fix this.

p. 344, last displayed equation: remove "$\gamma(S) \Rightarrow$ "

p. 346, line 5 of §14.4: "N_k" $\mapsto$ "$N^{(k)}$"

p. 348, first (and only) displayed equation should start with an opening parenthesis.

p. 349, line 5: "Riemann–Stieltjes" $\mapsto$ "Riemann-Stieltjes"

p. 357, first displayed equation in the proof: actually the definition on p. 91 requires us to show that

$$(\Delta \mathcal{S}_n)^2 - \Delta \mathcal{A}_n \leq h_n \cdot x_n$$

(which slightly simplifies the proof).

p. 362, penultimate line: "p. 86" $\mapsto$ "p. 87"

p. 365, second line after Equation (15.20): "(15.18)" $\mapsto$ "(15.19)"

p. 365, displayed equation in Proposition 15.6: Add "almost surely" after the equation.

p. 366, line 7 from bottom: "are negligible" $\mapsto$ "can be treated as negligible" (they are only negligible with high lower probability)

p. 369, third line below Equation (15.24): "$\sigma^2/2$" $\mapsto$ "$\sigma_0^2/2$"

p. 369, lines 7–8 from bottom: "$0.008 < 0.059$ (to accuracy 0.001)" $\mapsto$ "$0.008\% < 0.059\%$ (to accuracy 0.001%)"

p. 371, line 11 from bottom: "infinitely rich" $\mapsto$ "arbitrarily rich"

p. 376, penultimate line of citation [16]: there should be a comma before "is personally"

p. 382, citation [115]: "über" $\mapsto$ "Über"

p. 383, citation [137]: "two volumes" $\mapsto$ "Two volumes"

p. 387, second line of citations [197] and [198]: ".," $\mapsto$ ","

p. 388: Two articles by Jarl Waldemar Lindeberg were omitted: (1) Eine neue Herleitung des Exponentialgesetzes in der Wahrscheinlichkeitsrechnung, which appeared on pp. 211–225 of Volume 15 of *Mathematische Zeitschrift*

in 1922, and (2) Über das Exponentialgesetz in der Wahrscheinlichkeitsrechnung, which appeared in *Ann. Acad. Sci. Fenn.* in 1920.

p. 389, [221]: "Donald A. Martin. The determinacy of blackwell games." ↦ "Donald A. Martin. The determinacy of Blackwell games."

p. 390, first line of citation [249]: "1935" ↦ "1934"

p. 391, citation [267]: "Klassifikation der zufallsgesetze nach komplexität und ordnung." ↦ "Klassifikation der Zufallsgesetze nach Komplexität und Ordnung."

p. 393, citation [294]: "parts I and II" ↦ "Parts I and II"

p. 404, left column, penultimate line: "upper price" ↦ "weak upper price"

p. 408: Under "Game", the subentry "market" is out of alphabetical order.
p. 414+4, entry for Jackson's book: "Principle" ↦ "Principal"