Errata for Analysis of Financial Time Series, R.S. Tsay, Nov. 2001

Updated: September 27, 2005

1. Page 9, line 1 after equation (1.13): change $\hat{K}(x)$ to $\tilde{K}(x) - 3$.

2. Page 11: Equation (1.17)

$$E(R_t) = \exp(\mu + \frac{\sigma^2}{2}) - 1,$$

3. Page 12: Scale Mixture of Normal Distributions

$$r_t \sim (1 - X)N(\mu, \sigma_1^2) + XN(\mu, \sigma_2^2),$$

where $X$ is a Bernoulli random variable such that $P(X = 1) = \alpha, ...$

In Figure 1.1, the finite mixture of normal is $(1 - X)N(0, 1) + XN(0, 16)$ with $\alpha = 0.05$. The mixture density is standardized.

4. Page 38, first equation of Parameter Estimation: $r_t$ not $t_t$.

5. Page 53, last line: delete $r_{h+\ell-i}$ from the summation.

6. Page 89: log likelihood function involving degrees of freedom

$$\alpha, v \text{ not } \alpha, v \text{ also } (T - m) \text{ not } (T - m + 1)$$

7. Page 92, line 3 [line 1 after equation (3.11)]: The correct order of the standard errors is 0.0061, 0.0019, and 0.1443.

8. Page 95, 2nd paragraph: The literature ... is (not are).

9. Page 103, line 4 above subsection 3.7.1, change $\gamma \neq 0$ to $\theta \neq 0$.

10. Page 107, line 18, change $a_t$ to $a_{t-1}$.

11. Page 109, last line: The conditional expectation should be

$$\mu_t = E(r_t|F_{t-1}) = \phi_0 + \sum_{i=1}^{p} \phi_i r_{t-i}$$

12. Page 110, line 14, change “greater” to “greater than”.

13. Page 110, line -7, $E(a_t^2)$ should be $E(a_t^2) = \exp(\mu_h + \sigma_h^2/2)$.

14. Page 127, line 10: change $\sigma_a$ to $\sigma_t$.

15. Page 134, on Eq. (4.13), the $F(.)$ function typically satisfies $0 \leq F(.) \leq 1$.

16. Page 142, line 8: Change “The estimate of $m(x)$ is then defined as $\hat{a}$.” to “The estimate of $m(x)$ is then defined as $\hat{a}$, where $x$ is an observed data.”
17. Page 156, line −8; page 157, line 4; and page 173, line 24: Keenan not Kenan.

18. Page 177, last line of Eq. (5.1), the probability is $(1 - \pi)^2 \pi^k$, not $(1 - \pi^2) \pi^{k-1}$.

19. Page 187, line 2 after Eq. (5.15), change $k \times 1$ to $p \times 1$.

20. Page 191, line 1 after Eq. (5.28), change “variables” to “variable”.

21. Page 192, Eq. (5.29), right hand side, insert “[” after ln.

22. Page 197, line 3, change “scales in” to “scale on”.


   The pdf is given by

   \[
   f(x|\alpha, \beta, \kappa) = \begin{cases} 
   \frac{\alpha x^{\alpha-1}}{\beta^\alpha \Gamma(\kappa)} \exp \left[ - \left( \frac{x}{\beta} \right)^\alpha \right] & \text{if } x \geq 0 \\
   0 & \text{otherwise},
   \end{cases}
   \]


25. Page 231, Example 6.3. In the equation of $\hat{\sigma}$, change the numerator 0.00332 to 0.026303. The results remain correct, however.

26. Page 237, Example 6.6. line 9. Change $c_t = 0.00332 \Phi(-0.356246)$.. to $c_t = 0.026303 \Phi(-0.356246)$...

27. Page 242, line 9, change “be” to “is”.


29. Page 253, line 3, correct the spelling “integration”.

30. Page 258, line 8: change increase to increases.

31. Page 258, 4th paragraph: Change “Fo” to “For”.

32. Page 270, line 6, change “to estimate” to “estimating”.

33. Page 274, line −7, change “make uses” to “makes use”.

34. Page 283, subsection 7.6.2, line 7. Change $\alpha = \frac{1}{k}$ to $\alpha = \frac{-1}{k}$.

35. Page 290: missing subscript $i$. The likelihood function ... becomes

   \[
   L = \left( \prod_{i=1}^{N} \frac{1}{T} g(r_{i}; k_t, \alpha_t, \beta_t) \times \exp \left[ - \frac{1}{T} \int_0^T S(\eta; k_t, \alpha_t, \beta_t) dt \right] \right),
   \]
which reduces to

\[ L = \left( \prod_{i=1}^{N_\eta} g(r_{i,t}; k_t, \alpha_t, \beta_t) \right) \times \exp \left[ -\frac{1}{T} \sum_{t=1}^{N} S(\eta_t; k_t, \alpha_t, \beta_t) \right] \]

36. Page 308. Revise \( Q_k(m) \) for IBM and S&P 500 log returns as \( Q_2(1) = 9.81, Q_2(5) = 47.06, \) and \( Q_2(10) = 71.65. \) Also, for bond returns, \( Q_5(5) = 1065.63. \) The conclusions remain proper.

37. Page 311, line 5. Change

\[
\begin{bmatrix}
-0.6 & 1.1 \\
0.2 & 0.3
\end{bmatrix}
\quad \text{to} \quad
\begin{bmatrix}
1.1 & -0.6 \\
0.3 & 0.2
\end{bmatrix}.
\]

Also, line 9, change

\[
\begin{bmatrix}
-0.6 & 1.1 \\
0.8 & -0.8
\end{bmatrix}
\quad \text{to} \quad
\begin{bmatrix}
1.1 & -0.6 \\
-0.8 & 0.8
\end{bmatrix}.
\]

Also, line 12, change \(+0.8r_{2,t-1} - 0.8r_{1,t-1}\) to \(-0.8r_{2,t-1} + 0.8r_{1,t-1} \).

38. Page 321, line 8, change “is” to “are”.

39. Page 332, line 4. Change \( \beta x_{t-1} \) to \( \beta x_{t-1} \).

40. Page 337, line 2: \( y_t = c^t r \).

41. Page 361, the matrix equation: The (2,1)-element of the RHS should be \( q_{21,t} g_{11,t} \).

42. Page 367, line 2 after Eq. (9.20), change “coefficients” to “coefficient”.

43. Page 368, Example 9.2, line -4: change +0.119 to -0.119.

44. Page 379, Eqs (9.30) & (9.32): change \( r_{2,t-1} \) to \( r_{2,t-2} \).

45. Page 385, line 3 above Remark, change “essential” to “esentially”.

46. Page 388, line 1, change “identify” to “identity”.

47. Page 388, line -3: change Example 9.1 to Example 9.2.

48. Page 393, Problem 6 of Chapter 9. The actual starting date for the daily log returns is February 20, 1990 when the returns of Cisco stock became available.

49. Page 412, line 1 after Eq. (10.16), change “respective” to “respect”.  

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