MRA Volume II: Changes for Second Reprinting

When counting lines matrices and formulae count as one line and spare lines and footnotes do not count.
'Line –n' means n lines up from the bottom, so 'Line –1' means the last line.

Page	Location	Comment
5	First bullet	Change 4.3% to 18.6%
23	Line 5	The vector should be (0.25 0.75)' not (0.75 0.25)', here and immediately below
61	Line 1	0.1160 should read 0.1660
67	(II.2.15)	Change $\overline{P}^{\mathrm{f}}$ to $\overline{P}^{\mathrm{d}}$ and change the following text to "where $\overline{P}^{\mathrm{d}}$ is the present value of the cash flows in domestic currency, and $\overline{S}$ is the exchange rate at the time that the risk is measured. Thus $\overline{P}^{\mathrm{d}}$ and $\overline{S}$ are fixed."
95	Lines 11-12	Change 'independence' to 'zero correlation' and 'that the correlation will be 0' to 'independence'
106	Line 12	Interchange subscripts 0.025 and 0.975
126	II.3.8.6	Change CD-ROM to 'website' twice
152	(II.4.28)	Should read $\ln\overline{\sigma}^2 = \frac{\omega}{1-\beta}$ and insert 'log' before 'variance' in line above
158	(II.4.35)	Change $\ln\left(\sigma_t^2\right)$ to $\ln\left(\sigma_t\right)$. Also change 'standard' to standardized' in line above (II.4.34)
168	Fig II.4.11	Vertical scale should read 0.002, 0.004, 0.006, 0.008, 0.01, 0.012
188	Lines 4-5	To avoid sounding condescending to the reader (many apologies if this unintentionally came across), delete the sentence beginning: 'There are so many possibilities for extending the model …'
203	FN 3	Interchange 'unconditional' and 'conditional' in first sentence.
205	Line - 6	Insert spare line before 'The unconditional mean…' and do not indent.
205	(II.5.9) on	See the major change below
210	Line -5,-4	After variance, deleted the displayed formula and insert 'given by the formula derived at the end of section II.5.2.1. This is calculated in the spreadsheet for this example, as 0.102083.' Then run on to 'Using…'
210	Line -1	Should read $\left(0.06-1.96\times\sqrt{0.102083}, 0.06+1.96\times\sqrt{0.102083}\right)=\left(-0.566, 0.686\right)$ Dotted lines should be moved on Figure II.5.5 – replace with figure below.
206	FN 5	This footnote is a little unclear, so to clarify, replace it with: 'This is equivalent to the root of the characteristic equation being *inside* the unit circle. For instance, in the ARMA(2,1) model (II.5.8) we have $\delta(L)=1+0.5L=0$ when $L=-2$, and the characteristic equation for the moving average part is $x+0.5=0$, so it is invertible.'
210	Line 10	Reference should be to Figure II.5.3, not II.5.2.
213	Line –17	Replace I with 1.
220	Line – 10	Change – 0.112 to + 0.112
247	Line –11	Reference should be to Figure II.5.12, not II.5.8. Also on p249, line 6.
251	1st Bullet	Delete 'two' in line 2
257	(II.6.3)	Should read $\tau=\frac{29-11}{\frac{1}{2}\times 10\times 9}=0.4$, plus revised Table II.6.2 below.
273	(II.6.1)	In the large bracket on right hand side only, interchange u_1 with u_2. Also, do this for the formula below. [NB Another way of describing this correction is that the two parts inside the large brackets, in (II.6.61) and the equation below it, should be interchanged]
304	(II.7.3)	Insert square root sign over V(X)/V(Y)
307	Line – 3	Reference should be to (II.7.7), not (II.7.8)
308		Printer: please change font for Q to the usual one, several times on this page
309	Line 7	Reference should be to Figure II.6.14 not Figure II.6.8.
317	Line 11	Reference should be to Example II.6.4 not Example III.6.4.
322	(II.7.32)	Move second ln sign to outside bracket, thus: $\ln L(\mathbf{X};\boldsymbol{\beta})=\sum_{i=1}^{n}\left[\mathbf{1}_i\ln\left(h\left(\mathbf{x}_i;\boldsymbol{\beta}\right)\right)+\left(1-\mathbf{1}_i\right)\ln\left(1-h\left(\mathbf{x}_i;\boldsymbol{\beta}\right)\right)\right]$
326	Line – 5	subscript for F is 1, 762 , not 1,262
333	Bullets	Bullet 1: Replace 'the market is….active trading.' with 'active trading can rapidly die out.' Bullet 2: Replace 'calm down …period of' with 'change between periods of sluggish and' Bullet 3: Change 'high' to 'low'
364	FN 37	Delete 'Note the reason why' and change 'Stage 1' to 'Stage 2'

Errata for page 205. The text in the last 6 lines of page 205 should read:

The unconditional mean and variance of a stationary series are constant, and it is straightforward to verify that the mean of the ARMA process (II.5.7) is

$$E(X_t) = \alpha\left(1 - \sum_{i=1}^{p} \varrho_i\right)^{-1} \quad . \qquad \text{(II.5.9)}$$

However, the *conditional* mean and variance of (II.5.7) assume the lagged values of X are known, because they are in the information set I_{t-1} so

$$E_{t-1}(X_t) = \alpha + \varrho_1 X_{t-1} + \ldots + \varrho_p X_{t-p} \ \text{ and } \ V_{t-1}(X_t) = \sigma^2 . \qquad \text{(II.5.10)}$$

To derive the unconditional variances and covariances of (II.5.7), to keep the notation simple first write $y = E(X_t) = \alpha\left(1 - \sum_{i=1}^{p} \varrho_i\right)^{-1}$ and

$$Cov(X_i, X_j) = E(X_i X_j) - E(X_i)E(X_j) = x_k - y^2$$

where $k = |i-j|$. Let $\mathbf{x} = (x_0, x_1, \ldots, x_p)'$. On multiplying (II.5.7) successively by $X_t, X_{t-1}, \ldots, X_{t-p}$ and each time taking expectations, we obtain p + 1 linear equations from which we can solve for $\mathbf{x}$. For instance, for the ARMA(3,2) process we have:

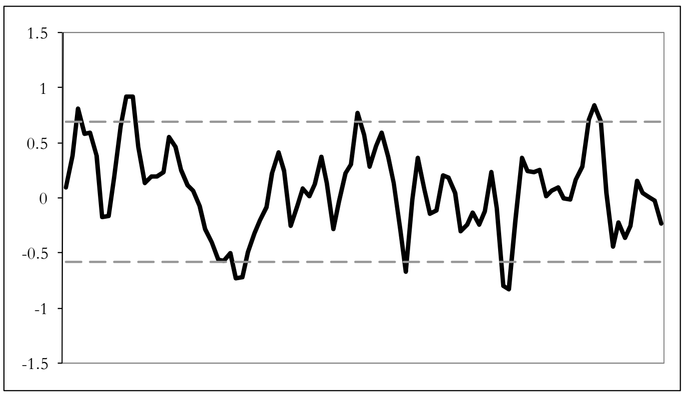
$$\begin{pmatrix} x_0 \\ x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} 0 & \varrho_1 & \varrho_2 & \varrho_3 \\ \varrho_1 & \varrho_2 & \varrho_3 & 0 \\ \varrho_2 & \varrho_1 + \varrho_3 & 0 & 0 \\ \varrho_3 & \varrho_2 & \varrho_1 & 0 \end{pmatrix} \begin{pmatrix} x_0 \\ x_1 \\ x_2 \\ x_3 \end{pmatrix} + \sigma^2 \begin{pmatrix} 1 \\ \varphi_1 \\ \varphi_2 \\ 0 \end{pmatrix} + \alpha y \begin{pmatrix} 1 \\ 1 \\ 1 \\ 1 \end{pmatrix} \Rightarrow \begin{pmatrix} x_0 \\ x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} 1 & -\varrho_1 & -\varrho_2 & -\varrho_3 \\ -\varrho_1 & 1 - \varrho_2 & -\varrho_3 & 0 \\ -\varrho_2 & -(\varrho_1 + \varrho_3) & 1 & 0 \\ -\varrho_3 & -\varrho_2 & -\varrho_1 & 1 \end{pmatrix}^{-1} \begin{pmatrix} \sigma^2 + \alpha y \\ \varphi_1 \sigma^2 + \alpha y \\ \varphi_2 \sigma^2 + \alpha y \\ \alpha y \end{pmatrix}$$

Similarly, for the ARMA(2,1) process:

$$\begin{pmatrix} x_0 \\ x_1 \\ x_2 \end{pmatrix} = \begin{pmatrix} 1 & -\varrho_1 & -\varrho_2 \\ -\varrho_1 & 1 - \varrho_2 & 0 \\ -\varrho_2 & -\varrho_1 & 1 \end{pmatrix}^{-1} \begin{pmatrix} \sigma^2 + \alpha y \\ \varphi_1 \sigma^2 + \alpha y \\ \alpha y \end{pmatrix} .$$

In example II.5.4 we derive the variance of the ARMA(2,1) process using the formula above and setting $V(X_t) = x_0 - y^2$.

New figure II.5.5:



Errata for Table II.6.2

Table II.6.2 Calculation of Kendall's tau[a]

X	Y	N_C	N_D
50	40	5	2
10	–10	7	1
50	20	4	3
–20	–80	9	0
20	50	5	4
60	10	3	5
10	10	6	1
0	30	5	4
90	60	9	0
50	40	5	2
Total Pairs		29	11

[a]The totals in the last two columns are divided by 2 to avoid double counting.