

## MRA Volume IV: 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
34	Line 4	Change ‘greater’ to ‘less’
37	6	\$45,505 should be \$46,505
89	Line 5	Insert ‘and $\epsilon_t$ is the specific return’ after ‘...on the market.’
89	Lines 9, 14 and 15	Change ‘residual’ to ‘specific’ (3 times)
89	Line - 12	After ‘that $\rho = 0.$ ’ insert: ‘Also, if the factor model is estimated by OLS, then $\rho = 0$ by construction.’
94	Line 13	Change [Equity VaR + Forex VaR] to [Equity VaR <sup>2</sup> + Forex VaR <sup>2</sup> ]
132	Table IV.2.5	Second row of figures should read: 20.69% 18.05% 17.30% 16.94% 16.74% 15.99% (last figure is correct)
133	(IV.2.90)	$\mathbf{v}_i$ should not be bold (but $\mathbf{v}$ alone should be bold, as it already is)
144	Line - 5	IV.3.5.6 should read IV.3.5.5
160	Table IV.3.5	First column should be as in spreadsheet, i.e. 1.02638E-06, 0.0676, 0.9225, -, 0.9931, 19.23% and 13849.14.
174	Point 5	Replace second $<$ with $\leq$
264	Lines 1 and 3	Change 27 April 2008 to 25 April 2008
267	Line -10	Change 27 April 2007 to 25 April 2008
274-5	Ex IV.5.7	Correct the following errors in the workbook: 1. Cell B22 sheet VaR – do not divide the vega by 100, i.e. delete the last “\100” in the formula. 2. Formula for Column M of sheet ‘Static 10-day P&L should be =L(row number)+VaR!\$B\$16*VaR!\$B\$32*VaR!\$B\$23*365*(10/250). Theta omitted to include risk-free rate as dividend yield (since underlying is a futures contract). See new results table below. Text will be changed to reflect these results in the next printing: Greek approximation is now quite accurate, but only for 1-day horizon.
298	EX IV.5.18	A similar error with vega and theta appear here, the one for vega being the most important. In the daily P&L sheet multiply the vega in column K by 100, and make similar changes for theta. New results in Table IV.5.24 below (different sims)
330	Line -13	In displayed equation change $\alpha$ to $1 - \alpha$
347	(IV.6.34)	Remove square root, also in (IV.6.35)
376	(IV.7.5)	Change $\sigma_1$ to $\sigma_2$ in second equation. Also in equation below (and there also change $\mu_1$ to $\mu_2$ )

**Table IV.5.10 Historical VaR with Greeks approximation**

<b>1% 1 day VaR</b>	Long		Short	
Delta only	\$4,943		\$4,622	
Delta–gamma	\$3,935		\$5,504	
Delta–gamma–vega	\$4,524		\$6,750	
Delta–gamma–vega–theta	\$4,525		\$6,750	
All Greeks	\$4,525		\$6,750	
Exact valuation	\$4,605		\$6,467	
	Dynamic portfolio		Static portfolio	
<b>1% 10 day VaR</b>	Long	Short	Long	Short
Delta only	\$15,630	\$14,618	\$13,612	\$12,719
Delta–gamma	\$12,443	\$17,405	\$6,015	\$19,392
Delta–gamma–vega	\$14,307	\$21,345	\$7,498	\$21,576
Delta–gamma–vega–theta	\$14,308	\$21,344	\$9,188	\$19,886
All Greeks	\$14,309	\$21,344	\$9,188	\$19,886
Exact valuation	\$14,561	\$20,451	\$7,826	\$17,520

**Table IV.5.24 Comparison of Monte Carlo and historical VaR**

1% 10-day VaR	Monte Carlo				Historical			
	(a) Dynamic		(b) Static		(c) Dynamic		(d) Static	
	Long	Short	Long	Short	Long	Short	Long	Short
Delta only	\$11,594	\$12,535	\$22,159	\$24,095	\$15,630	\$14,618	\$13,612	\$12,719
Delta–gamma	\$9,853	\$14,571	\$6,095	\$47,898	\$12,443	\$17,405	\$6,015	\$19,392
Delta–gamma–vega	\$8,489	\$12,490	\$6,666	\$48,943	\$14,307	\$21,345	\$7,498	\$21,576
Delta–gamma–vega–theta	\$8,490	\$12,489	\$8,540	\$47,068	\$14,308	\$21,344	\$9,374	\$19,701