FM3, Cumulative Typos

This version: 12 September 2008

http://finance.wharton.upenn.edu/~benninga/fm3/fm3_cumulative_typos.doc

Financial Modeling, 3rd edition will be reprinted a number of times. At each reprinting I will correct reported typos and add the names of those reporting to the preface.

Notation: This is a cumulative list of all known typos. The square brackets indicate in which printing the typo was corrected. Thus:

- **[1] Page 20, line 4**: Indicates a typo which was corrected that exists in the first printing and does not exist in later printings.
- **[2] Page 890, exercise 6**: Indicates a typo that exists in both the first and second printings but is corrected in the third printing.

If you have more typos to report, please write me at Benninga@wharton.upenn.edu .

Add names to preface of second printing (names added to list on page xxvii in alphabetical order): Sara Tromp, Alexander Nagornov, Roberto Wessels, Polina Elencheva, Julian Bongo, Sali Salieski, Edwin Neave, Robert Keyfitz, Stephen R Ellis, Stanislava Prokopova, Nikolas Rokkanen , Sanjiv Sabherwal, Sumit Vakil, Jeff Levitt, Jeff Marsick, , Michael Ezewoko, Rik Albrecht , Joseph Williams, Leon Lasdon, Stephen Marley, Michael Oczkowski, Apostol Bakalov, Max Nokhrin, Gerald Strever

Names added to preface of third printing: Eric D. Chason, Jean-Philippe Ducros, Luis Carlos López Wonenburguer, Todd Hildebrant, Dina Rajaona, Daniel R. Sholem, Swarup Ghosh

[1] Page before title page: It says "Neither MIT press nor the authors is responsible" …. Shouldn't this be are responsible? [My 96 year-old aunt Sara pointed this out to me …!]

[1] On the disk with the book, under the subdirectory **Additional materials**, there is a typo in the file "Adding Getformula to your spreadsheet.doc". The last line of the VBA program is missing. It is added below and highlighted.

```
'Prints out formulas as text
'Thanks to Maja Sliwinski and Beni Czaczkes
Function getformula(r As Range) As String
   Application.Volatile
   If r.HasArray Then
   getformula = "<-- " & " {" & r.FormulaArray & "}"
   Else
   getformula = "<-- " & " " & r.FormulaArray
   End If
End Function
```

[1] Page 20, line 4:

Instead of: "years 1, 2, 9"

Should be: "years 1 to 9"

[2] Page 32, exercise 4 solution on disk: Cell B2 should be =B5+NPV(B1,B6:B10) and not as printed.

[1] Page 41: The following formula has typo.

$$P_0 = \frac{Div_0(1+g)}{1+r_E} + \frac{Div_1*(1+g)^2}{(1+r_E)^2} + \frac{Div_1*(1+g)^3}{(1+r_E)^3} + \frac{Div_1*(1+g)^4}{(1+r_E)^4} \ldots$$

$$= \sum_{t=1}^{\infty} \frac{Div_0*(1+g)^t}{(1+r_E)^t}$$

It should be:

$$P_0 = \frac{Div_0(1+g)}{1+r_E} + \frac{Div_0*(1+g)^2}{(1+r_E)^2} + \frac{Div_0*(1+g)^3}{(1+r_E)^3} + \frac{Div_0*(1+g)^4}{(1+r_E)^4} \ldots$$

$$= \sum_{t=1}^{\infty} \frac{Div_0*(1+g)^t}{(1+r_E)^t}$$

[1] Page 72, top Excel clip; there is a mistake in cell B14. Should be:

	A	B	C	D	E	F
1	**KRAFT: COST OF EQUITY r_E BASED ON CASH FLOW TO EQUITY**					
2	Shares outstanding	1,669,880,755				
3	Share price, end 2005	27.75				
4	Equity value, E	46,339,190,951	<-- =B2*B3			
5	End 2005 total equity payout	2,612,000,000	<-- =E18			
6						
7	High growth rate, g_{high}	20.00%	<-- Guess			
8	Number of high-growth years	3	<-- Guess			
9	Normal growth rate, g_{normal}	6%	<-- Guess			
10						
11	Cost of equity, r_E, using the function **twostagegordon**	14.46%	<-- =twostagegordon(B4,B5,B7,B8,B9)			
12						
13	**Date**	**Stock repurchases**	**Dividends paid**	**Stock issuance**	**Cash flow to equity holders**	
14	31-Dec-01	170,000,000	225,000,000		395,000,000	<-- =B14+C14-D14
15	31-Dec-02	372,000,000	936,000,000	8,425,000,000	-7,117,000,000	<-- =B15+C15-D15
16	31-Dec-03	372,000,000	1,089,000,000		1,461,000,000	
17	31-Dec-04	688,000,000	1,280,000,000		1,968,000,000	
18	31-Dec-05	1,175,000,000	1,437,000,000		2,612,000,000	
19	Growth rates					
20	Four year	62.14%	58.97%		60.36%	<-- =(E18/E14)^(1/4)-1
21	Two year	77.72%	14.87%		33.71%	<-- =(E18/E16)^(1/2)-1

[2] Pages 127-129: The mid-year valuation factor $(1+WACC)^{0.5}$ should be added to the following cells: B84 of Exercise 2, B82 of Exercise 3, B81 of Exercise 4,

[1] Page 138: In spreadsheet at top, cell A6 "before" instead of "nefore"

[1] Page 139, line 2 below spreadsheet: "some" instead of "come"

[1] Page 183: "Basil" should be "Basle" or "Basel"

[2] Page 203, last word of second paragraph: "lessor" should be "lessee"

[1] Page 226. The formula in cell D15 is incorrectly identified (the numbers and the actual formula in the cell are correct). The spreadsheet should look like the following:

	A	B	C	D	E	F
1	**UNDERSTANDING THE IRR**					
2	**Year**	**Cash flow**				
3	0	-100,000				
4	1	31,000				
5	2	22,000				
6	3	16,000				
7	4	22,000				
8	5	35,000				
9						
10	IRR	8.097%	<-- =IRR(B3:B8,0)			
11						
12	**CASH FLOW ATTRIBUTION TABLE**					
13				**Attribution of cash flow**		
14	**Year**	**Investment at beginning of period**	**Cash flow at end of year**	**Income**	**Repayment of investment**	
15	1	100,000	31,000	8,097	22,903	<-- =C15-D15
16	2	77,097	22,000	6,242	15,758	
17	3	61,339	16,000	4,966	11,034	
18	4	50,305	22,000	4,073	17,927	
19	5	32,378	35,000	2,622	32,378	
20						
21	=B16-E16		=$B$10*B15			

[1] Page 229, line 10 of second bullet:

Instead of: … at the beginning of year 6

Should be: … at the beginning of year 9

[1] Page 242, 5 lines under the spreadsheet.

Instead of: Covar(SLE returns,BBY returns)

Should be: Covar(WMT returns, TGT returns)

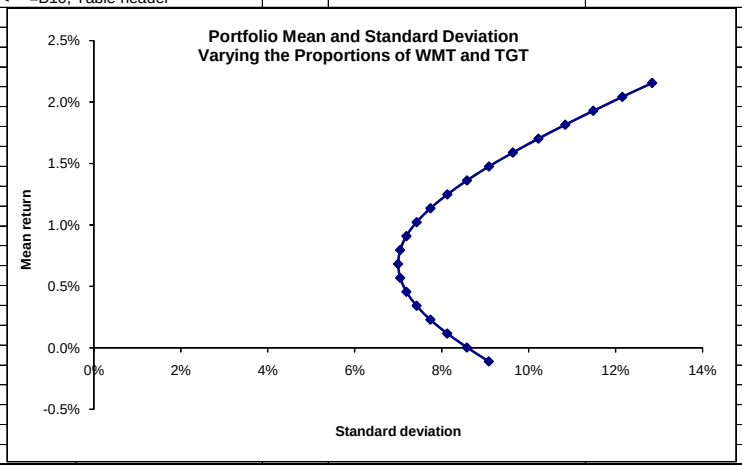
[1] Page 244, line 2:

Instead of: "linearly related with a positive slope"

Should be: "linearly related with a negative slope"

[1] Page 246, spreadsheet cell B11: Incorrectly references cell B7 (should be cell B6). The corrected spreadsheet should look like this:

	A	B	C	D	E	F	G	H
1	**CALCULATING THE MEAN AND STANDARD DEVIATION OF A PORTFOLIO**							
2	Asset returns	WMT	TGT					
3	Mean return	1.59%	0.46%					
4	Variance	0.93%	0.52%					
5	Standard deviation	9.63%	7.19%					
6	Covariance	0.0038						
7								
8	Proportion of WMT	0.5	<-- In the data table below this is varied from -0.5 to 1.5					
9								
10	Portfolio mean return	1.02%	<-- =B8*B3+(1-B8)*C3					
11	Portfolio return variance	0.0055	<-- =B8^2*B4+(1-B8)^2*C4+2*B8*(1-B8)*B6					
12	Portfolio return standard deviation	7.42%	<-- =SQRT(B11)					
13								
14	**Data table: Varying the proportion of WMT**							
15		Portfolio standard deviation	Porfolio mean return					
16	Proportion of WMT	7.42%	1.02%	<-- =B10, Table header				
17	-0.5	9.08%	-0.11%					
18	-0.4	8.58%	0.00%					
19	-0.3	8.13%	0.12%					
20	-0.2	7.74%	0.23%					
21	-0.1	7.42%	0.34%					
22	0	7.19%	0.46%					
23	0.1	7.04%	0.57%					
24	0.2	6.99%	0.68%					
25	0.3	7.04%	0.80%					
26	0.4	7.19%	0.91%					
27	0.5	7.42%	1.02%					
28	0.6	7.74%	1.14%					
29	0.7	8.13%	1.25%					
30	0.8	8.58%	1.36%					
31	0.9	9.08%	1.48%					
32	1	9.63%	1.59%					
33	1.1	10.22%	1.70%					
34	1.2	10.84%	1.82%					
35	1.3	11.48%	1.93%					
36	1.4	12.15%	2.04%					
37	1.5	12.84%	2.16%					
38								
39								



[1] Page 269, bottom spreadsheet, column E: should refer to portfolio y not x.

[1] Page 270, same as above

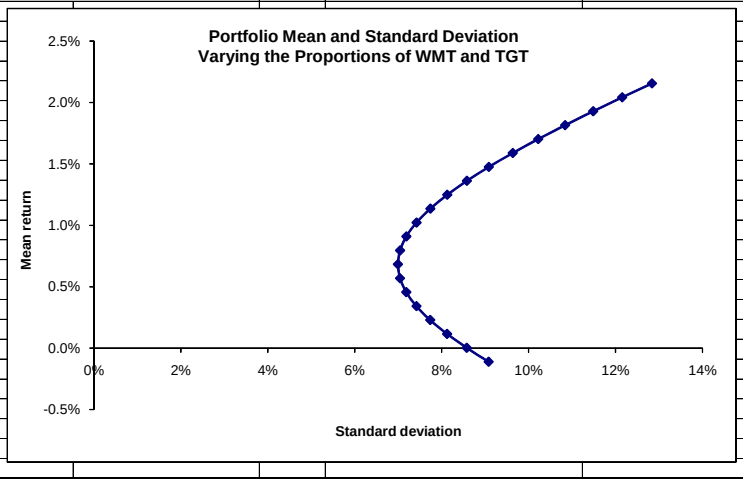
[1] Page 271: "Data table header refers to B36 and <u>B37</u>" not as written

[1] Page 281: The function in cell B42 contains a mistake. Should be:

	A	B	C	D	E	F
41	**Check Propositions 3 & 4: Step 2 coefficients should be: Intercept = c, Slope = $E(r_w)$ - c**					
42	Intercept = c ?	yes	<-- =IF(ROUND(B37-B21,10)=0,"yes","no")			
43	Slope = $E(r_w)$ - c ?	yes	<-- =IF(B38=G11-B21,"yes","no")			

[1] Page 246: There is a mistake in cell B11 (refers to cell b7 instead of b6). Means that the picture in the book needs to be replaced.

	A	B	C	D	E	F	G	H
1	**CALCULATING THE MEAN AND STANDARD DEVIATION OF A PORTFOLIO**							
2	Asset returns	WMT	TGT					
3	Mean return	1.59%	0.46%					
4	Variance	0.93%	0.52%					
5	Standard deviation	9.63%	7.19%					
6	Covariance	0.0038						
7								
8	Proportion of WMT	0.5	<-- In the data table below this is varied from -0.5 to 1.5					
9								
10	Portfolio mean return	1.02%	<-- =B8*B3+(1-B8)*C3					
11	Portfolio return variance	0.0055	<-- =B8^2*B4+(1-B8)^2*C4+2*B8*(1-B8)*B6					
12	Portfolio return standard deviation	7.42%	<-- =SQRT(B11)					
13								
14	**Data table: Varying the proportion of WMT**							
15		Portfolio standard deviation	Porfolio mean return					
16	Proportion of WMT	7.42%	1.02%	<-- =B10, Table header				
17	-0.5	9.08%	-0.11%					
18	-0.4	8.58%	0.00%					
19	-0.3	8.13%	0.12%					
20	-0.2	7.74%	0.23%					
21	-0.1	7.42%	0.34%					
22	0	7.19%	0.46%					
23	0.1	7.04%	0.57%					
24	0.2	6.99%	0.68%					
25	0.3	7.04%	0.80%					
26	0.4	7.19%	0.91%					
27	0.5	7.42%	1.02%					
28	0.6	7.74%	1.14%					
29	0.7	8.13%	1.25%					
30	0.8	8.58%	1.36%					
31	0.9	9.08%	1.48%					
32	1	9.63%	1.59%					
33	1.1	10.22%	1.70%					
34	1.2	10.84%	1.82%					
35	1.3	11.48%	1.93%					
36	1.4	12.15%	2.04%					
37	1.5	12.84%	2.16%					
38								
39								
40								



[1] Page 281 , spreadsheet at bottom of page needs to be replaced with the following (there's an error in cell B42):

	A	B	C	D	E	F
41	**Check Propositions 3 & 4: Step 2 coefficients should be: Intercept = c, Slope = E(r_w) - c**					
42	Intercept = c ?	yes	<-- =IF(ROUND(B37-B21,10)=0,"yes","no")			
43	Slope = E(r_w) - c ?	yes	<-- =IF(B38=G11-B21,"yes","no")			

[1] Page 282, same error in spreadsheet on bottom of page. Should be:

	A	B	C	D	E	F	G	H
1	**ILLUSTRATING PROPOSITIONS 3-5** **This time the constant is 2% (cell B21)**							
2	**Dates**	**Asset 1**	**Asset 2**	**Asset 3**	**Asset 4**		Efficient portfolio w	
3	1	-6.63%	-2.49%	-4.27%	11.72%		-2.95%	<-- {=MMULT(B3:E9,B23:B26)}
4	2	8.53%	2.44%	-3.15%	-8.33%		3.64%	
5	3	1.79%	4.46%	1.92%	19.18%		5.16%	
6	4	7.25%	17.90%	-6.53%	-7.41%		-2.40%	
7	5	0.75%	-8.22%	-1.76%	-1.44%		2.24%	
8	6	-1.57%	0.83%	12.88%	-5.92%		0.01%	
9	7	-2.10%	5.14%	13.41%	-0.46%		-0.26%	
10								
11	Mean	1.15%	2.87%	1.79%	1.05%	<-- =AVERAGE(E3:E9)	0.78%	
12								
13	**Variance-covariance matrix**							
14		Asset 1	Asset 2	Asset 3	Asset 4			
15	Asset 1	0.0024	0.0019	-0.0015	-0.0024	<-- {=MMULT(TRANSPOSE(B3:E9-B11:E11),B3:E9-B11:E11)/7}		
16	Asset 2	0.0019	0.0056	-0.0007	-0.0016			
17	Asset 3	-0.0015	-0.0007	0.0057	-0.0005			
18	Asset 4	-0.0024	-0.0016	-0.0005	0.0094			
19								
20	**Finding an efficient portfolio w**							
21	Constant	2.00%						
22								
23	Asset 1	0.8234	<-- {=MMULT(MINVERSE(B15:E18),TRANSPOSE(B11:E11)-B21)/SUM(MMULT(MINVERSE(B15:E18),TRANSPOSE(B11:E11)-B21))}					
24	Asset 2	-0.2869						
25	Asset 3	0.2278						
26	Asset 4	0.2357						
27								
28								
29	**Implementing propositions 3-5--finding the SML**							
30	Step 1: Regress each asset's returns on those of the efficient portfolio w							
31		**Asset 1**	**Asset 2**	**Asset 3**	**Asset 4**			
32	Alpha	0.0061	0.0342	0.0165	0.0044	<-- =INTERCEPT(E3:E9,$G$3:$G$9)		
33	Beta	0.6968	-0.7075	0.1752	0.7776	<-- =SLOPE(E3:E9,$G$3:$G$9)		
34	R-squared	0.1570	0.0709	0.0042	0.0506	<-- =RSQ(E3:E9,$G$3:$G$9)		
35								
36	Step 2: Regress the asset mean returns on their betas							
37	Intercept	0.02	<-- =INTERCEPT(B11:E11,B33:E33)					
38	Slope	-0.0122	<-- =SLOPE(B11:E11,B33:E33)					
39	R-squared	1.0000	<-- =RSQ(B11:E11,B33:E33)					
40								
41	**Check Propositions 3 & 4: Step 2 coefficients should be:** **Intercept = c, Slope = $E(r_w)$ - c**							
42	Intercept = c ?	yes	<-- =IF(ROUND(B37-B21,10)=0,"yes","no")					
43	Slope = $E(r_w)$ - c ?	yes	<-- =IF(B38=G11-B21,"yes","no")					

[1] page 301: Picture should be replaced by following (there's a non-critical error in row 17):

	A	B	C	D	E	F	G	H	I
1	**COMPUTING AN EFFICIENT PORTFOLIO**								
2		**GE**	**MSFT**	**JNJ**	**K**	**BA**	**IBM**		**Means**
3	**GE**	0.1035	0.0758	0.0222	-0.0043	0.0857	0.0123		23.66%
4	**MSFT**	0.0758	0.1657	0.0412	-0.0052	0.0379	-0.0022		21.38%
5	**JNJ**	0.0222	0.0412	0.0360	0.0181	0.0101	-0.0039		18.43%
6	**K**	-0.0043	-0.0052	0.0181	0.0570	-0.0076	-0.0046		5.51%
7	**BA**	0.0857	0.0379	0.0101	-0.0076	0.0896	0.0248		27.63%
8	**IBM**	0.0123	-0.0022	-0.0039	-0.0046	0.0248	0.0184		17.63%
9									
10	Risk-free rate	2%							
11									
12	**The efficient portfolio is computed by the array formula** **{=TRANSPOSE(MMULT(MINVERSE(B3:G8),I3:I8-B10)/SUM(MMULT(MINVERSE(B3:G8),I3:I8-B10)))}.** **The cells below use TRANSPOSE( ) to make this a row vector.**								
13		**GE**	**MSFT**	**JNJ**	**K**	**BA**	**IBM**		
14	Efficient portfolio	26.37%	-6.05%	36.98%	-4.81%	-33.87%	81.39%		
15									
16	Market value ($billion)	336.44	305.82	152.93	15.44	41.01	16.98		
17	Market proportions	38.73%	35.21%	17.61%	1.78%	4.72%	1.96%	<-- =G16/SUM($B$16:$G$16)	

[2] Page 313: The picture on this page should be replaced by:

	A	B	C	D	E	F	G	H
1	**COMPUTING THE GLOBAL MINIMUM VARIANCE PORTFOLIO USING CONSTANT CORRELATION MODEL**							
2	**Return data**							
3	**Date**	**GE**	**MSFT**	**JNJ**	**K**	**BA**	**IBM**	
4	3-Jan-94	56.44%	-1.50%	6.01%	-9.79%	58.73%	7.74%	
5	3-Jan-95	18.23%	33.21%	41.56%	7.46%	-0.24%	-12.16%	
6	2-Jan-96	56.93%	44.28%	57.71%	37.76%	65.55%	30.00%	
7	2-Jan-97	42.87%	79.12%	22.94%	-5.09%	54.34%	-41.78%	
8	2-Jan-98	47.11%	38.04%	17.62%	32.04%	37.11%	47.32%	
9	4-Jan-99	34.55%	85.25%	26.62%	-10.74%	15.05%	37.70%	
10	3-Jan-00	28.15%	11.20%	3.41%	-48.93%	43.53%	-13.32%	
11	2-Jan-01	4.61%	-47.19%	10.69%	11.67%	28.29%	-78.39%	
12	2-Jan-02	-19.74%	4.27%	23.11%	19.90%	-15.09%	-25.16%	
13	2-Jan-03	-44.78%	-29.47%	-5.67%	10.88%	-23.23%	-137.03%	
14	2-Jan-04	35.90%	18.01%	-1.27%	15.49%	39.82%	16.44%	
15								
16	Average	23.66%	21.38%	18.43%	5.51%	27.63%	-15.33%	<-- =AVERAGE(G4:G14)
17	Standard deviation	32.17%	40.71%	18.97%	23.86%	29.93%	54.71%	<-- =STDEV(G4:G14)
18	Variance	0.1035	0.1657	0.0360	0.0570	0.0896	0.2993	<-- =VAR(G4:G14)
19	Constant correlation	0.3000						
20								
21	**Uses the array formula {=IF(A23:A28=B22:G22,B18:G18,MMULT(TRANSPOSE(B17:G17),B17:G17)*B19)} to compute the constant correlation matrix**							
22		**GE**	**MSFT**	**JNJ**	**K**	**BA**	**IBM**	
23	**GE**	0.1035	0.0393	0.0183	0.0230	0.0289	0.0528	
24	**MSFT**	0.0393	0.1657	0.0232	0.0291	0.0366	0.0668	
25	**JNJ**	0.0183	0.0232	0.0360	0.0136	0.0170	0.0311	
26	**K**	0.0230	0.0291	0.0136	0.0570	0.0214	0.0392	
27	**BA**	0.0289	0.0366	0.0170	0.0214	0.0896	0.0491	
28	**IBM**	0.0528	0.0668	0.0311	0.0392	0.0491	0.2993	
29								
30	**Uses formula {=MMULT(MINVERSE(B23:G28),IF(A31:A36=A31:A36,1,0))/SUM(MMULT(MINVERSE(B23:G28),IF(A31:A36=A31:A36,1,0)))} to compute the global minimum variance portfolio**							
31	**GE**	0.0800						
32	**MSFT**	0.0030						
33	**JNJ**	0.5645			**GMVP statistics**			
34	**K**	0.2782			Mean return	17.71%	<-- =MMULT(B16:G16,B31:B36)	
35	**BA**	0.1152			Variance	0.4027	<-- {=MMULT(MMULT(TRANSPOSE(B31:B36),B4:G9),B31:B36)}	
36	**IBM**	-0.0409			Sigma	63.46%	<-- =SQRT(F35)	

[1] Page 315, exercise 2: The formula for the answer is wrong. The correct answer is given below:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
21		**La-Z-Boy**	**Kimball**	**Flexsteel**	**Leggett & Platt**	**Herman Miller**	**Shaw Industries**							
22	**La-Z-Boy**	0.1267	0.1368	0.0936	0.1224	0.1224	0.2016	<-- {=IF(B21:G21=A22:A27,B18:G18,MMULT(TRANSPOSE(B15:G15),B15:G15)*B19)}						
23	**Kimball**	0.1368	0.0713	0.1112	0.1454	0.1454	0.2394							
24	**Flexsteel**	0.0936	0.1112	0.3667	0.0995	0.0995	0.1638							
25	**Leggett & Platt**	0.1224	0.1454	0.0995	0.1136	0.1301	0.2142							
26	**Herman Miller**	0.1224	0.1454	0.0995	0.1301	0.0654	0.2142							
27	**Shaw Industries**	0.2016	0.2394	0.1638	0.2142	0.2142	0.1819							

[2] Page 314: Top picture should be the following:

	A	B	C	D	E	F	G	H
1	**COMPUTING THE GLOBAL MINIMUM VARIANCE PORTFOLIO USING A SHRINKAGE VARIANCE-COVARIANCE MATRIX**							
2	**Return data**							
3	**Date**	**GE**	**MSFT**	**JNJ**	**K**	**BA**	**IBM**	
4	3-Jan-94	56.44%	-1.50%	6.01%	-9.79%	58.73%	21.51%	
5	3-Jan-95	18.23%	33.21%	41.56%	7.46%	-0.24%	6.04%	
6	2-Jan-96	56.93%	44.28%	57.71%	37.76%	65.55%	27.33%	
7	2-Jan-97	42.87%	79.12%	22.94%	-5.09%	54.34%	41.08%	
8	2-Jan-98	47.11%	38.04%	17.62%	32.04%	37.11%	2.63%	
9	4-Jan-99	34.55%	85.25%	26.62%	-10.74%	15.05%	-2.11%	
10	3-Jan-00	28.15%	11.20%	3.41%	-48.93%	43.53%	23.76%	
11	2-Jan-01	4.61%	-47.19%	10.69%	11.67%	28.29%	21.76%	
12	2-Jan-02	-19.74%	4.27%	23.11%	19.90%	-15.09%	4.55%	
13	2-Jan-03	-44.78%	-29.47%	-5.67%	10.88%	-23.23%	15.54%	
14	2-Jan-04	35.90%	18.01%	-1.27%	15.49%	39.82%	31.80%	
15								
16	**Average**	23.66%	21.38%	18.43%	5.51%	27.63%	17.63%	<-- =AVERAGE(G4:G14)
17	**Standard deviation**	32.17%	40.71%	18.97%	23.86%	29.93%	13.56%	<-- =STDEV(G4:G14)
18	**Variance**	0.1035	0.1657	0.0360	0.0570	0.0896	0.0184	<-- =VAR(G4:G14)
19								
20	**Shrinkage factor λ**	0.3	<-- This is the weight put on the sample var-cov					
21								
22	**Shrinkage matrix** **Uses the array formula {=B20*MMULT(TRANSPOSE(B4:G14-B16:G16),B4:G14-B16:G16)/10+(1-B20)*MMULT(TRANSPOSE(B4:G14-B16:G16),B4:G14-B16:G16)/10*IF(A24:A29=B23:G23,1,0)}** **to compute the shrinkage covariance matrix**							
23		**GE**	**MSFT**	**JNJ**	**K**	**BA**	**IBM**	
24	**GE**	0.1035	0.0228	0.0066	-0.0013	0.0257	0.0037	
25	**MSFT**	0.0228	0.1657	0.0124	-0.0016	0.0114	-0.0007	
26	**JNJ**	0.0066	0.0124	0.0360	0.0054	0.0030	-0.0012	
27	**K**	-0.0013	-0.0016	0.0054	0.0570	-0.0023	-0.0014	
28	**BA**	0.0257	0.0114	0.0030	-0.0023	0.0896	0.0074	
29	**IBM**	0.0037	-0.0007	-0.0012	-0.0014	0.0074	0.0184	
30								
31	**Uses formula {=MMULT(MINVERSE(B24:G29),IF(A32:A37=A32:A37,1,0))/SUM(MMULT(MINVERSE(B24:G29),IF(A32:A37=A32:A37,1,0)))} to compute the global minimum variance portfolio**							
32	**GE**	0.0407						
33	**MSFT**	0.0337						
34	**JNJ**	0.2261			**GMVP statistics**			
35	**K**	0.1556			Mean return	16.71%	<-- {=MMULT(B16:G16,B32:B37)}	
36	**BA**	0.0412			Variance	0.0092	<-- {=MMULT(MMULT(TRANSPOSE(B32:B37),B24:G29),B32:B37)}	
37	**IBM**	0.5027			Sigma	9.59%	<-- =SQRT(F36)	

[2] Page 314: Bottom picture should be the following:

	J	K	L	M	N	O	P	Q	R
2	**Data table: varying the shrinkage factor λ**								
3	**λ**	**GMVP mean**	**GMVP sigma**	**GE**	**MSFT**	**JNJ**	**K**	**BA**	**IBM**
4									
5	0	17.64%	8.89%	0.0763	0.0477	0.2196	0.1387	0.0882	0.4295
6	0.1	17.29%	9.19%	0.0630	0.0420	0.2216	0.1467	0.0726	0.4541
7	0.2	16.98%	9.42%	0.0511	0.0374	0.2238	0.1523	0.0571	0.4783
8	0.3	16.71%	9.59%	0.0407	0.0337	0.2261	0.1556	0.0412	0.5027
9	0.4	16.46%	9.71%	0.0319	0.0308	0.2287	0.1568	0.0243	0.5274
10	0.5	16.24%	9.77%	0.0251	0.0286	0.2316	0.1559	0.0055	0.5533
11	0.6	16.03%	9.79%	0.0214	0.0268	0.2349	0.1528	-0.0168	0.5811
12	0.7	15.81%	9.75%	0.0232	0.0247	0.2383	0.1470	-0.0457	0.6124
13	0.8	15.56%	9.63%	0.0379	0.0209	0.2415	0.1378	-0.0894	0.6513
14	0.9	15.15%	9.35%	0.0952	0.0087	0.2422	0.1217	-0.1807	0.7130
15	1	12.73%	7.73%	0.6105	-0.1034	0.2074	0.0539	-0.7704	1.0019

[2] Page 316, exercise 4 answer on disk: The formula in cells B11:B16 should be:

Editor: Page 316 typo will go into the files on the disk

Instead of:
=TRANSPOSE(MMULT(TRANSPOSE(K2:K7),B2:G7)/MMULT(MMULT(TRANSPOSE(K2:K7),B2:G7),K2:K7))

Should be:
=TRANSPOSE(MMULT(TRANSPOSE(K2:K7),MINVERSE(B2:G7))/MMULT(MMULT(TRANSPOSE(K2:K7),MINVERSE(B2:G7)),K2:K7))

[1] Page 344, Chapter 12: The screen clip does not include all the data. The correct clip should be:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	**PORTFOLIO OPTIMIZATION WITHOUT SHORT SALES**									**RESULTS**						
2		**Variance-covariance matrix**					**Means**			**c**	**Sigma**	**Mean**	**x_1**	**x_2**	**x_3**	**x_4**
3		0.10	0.03	-0.08	0.05		8%		Ctrl+A works the VBA program	-0.035	20.24%	8.70%	0.6049	0.0885	0.3066	0.0000
4		0.03	0.20	0.02	0.03		9%		which calculates efficient	-0.03	20.25%	8.70%	0.6042	0.0887	0.3070	0.0000
5		-0.08	0.02	0.30	0.20		10%		portfolios for no-short sales.	-0.025	20.25%	8.70%	0.6035	0.0890	0.3075	0.0000
6		0.05	0.03	0.20	0.90		11%		This program iteratively	-0.02	20.25%	8.71%	0.6027	0.0893	0.3080	0.0000
7									substitutes a constant ranging	-0.015	20.25%	8.71%	0.6017	0.0897	0.3086	0.0000
8		c	16.0%	<-- This is the constant					from -3.5% 'till 16% (1/2%	-0.01	20.26%	8.71%	0.6007	0.0901	0.3092	0.0000
9									jumps) and calculates the	-0.005	20.26%	8.71%	0.5994	0.0908	0.3098	0.0000
10									optimal portfolio.	0	20.27%	8.71%	0.5982	0.0912	0.3106	0.0000
11	x_1	0.0000								0.005	20.27%	8.71%	0.5968	0.0917	0.3115	0.0000
12	x_2	0.0000								0.01	20.28%	8.72%	0.5950	0.0926	0.3123	0.0000
13	x_3	0.0000								0.015	20.29%	8.72%	0.5932	0.0934	0.3134	0.0000
14	x_4	1.0000								0.02	20.30%	8.72%	0.5910	0.0943	0.3147	0.0000
15	Total	1.0000	<-- =SUM(B11:B14)							0.025	20.31%	8.73%	0.5885	0.0953	0.3161	0.0000
16										0.03	20.32%	8.73%	0.5856	0.0965	0.3179	0.0000
17	Portfolio mean	11.00%	<-- {=MMULT(TRANSPOSE(B11:B14),G3:G6)}							0.035	20.34%	8.74%	0.5821	0.0980	0.3199	0.0000
18	Portfolio sigma	94.87%	<-- {=SQRT(MMULT(TRANSPOSE(B11:B14),MMULT(B3:E6,B11:B14)))}							0.04	20.37%	8.74%	0.5779	0.0998	0.3224	0.0000
19	Theta	-5.27%	<-- =(portfolio_mean-C8)/Portfolio_sigma							0.045	20.41%	8.75%	0.5726	0.1019	0.3255	0.0000
20										0.05	20.46%	8.76%	0.5659	0.1047	0.3294	0.0000
21										0.055	20.54%	8.78%	0.5572	0.1083	0.3345	0.0000
22										0.06	20.67%	8.80%	0.5452	0.1133	0.3415	0.0000
23										0.065	20.90%	8.82%	0.5277	0.1205	0.3518	0.0000
24										0.07	21.36%	8.87%	0.4992	0.1324	0.3684	0.0000
25										0.075	23.27%	9.01%	0.4267	0.1630	0.3856	0.0248

[1] Page 361, formula at bottom of page:

Instead of: $r_{HD,opinion\ adjusted} = r_{HD,market} + \frac{Cov\left(r_{HD,GM}\right)}{Var\left(r_{HD}\right)}\delta_{GM} = 1.11\%$

Should be: $r_{HD,opinion\ adjusted} = r_{HD,market} + \frac{Cov\left(r_{HD}, r_{GM}\right)}{Var\left(r_{GM}\right)}\delta_{GM} = 1.11\%$

[1] Page 362, formula at top of page:

Instead of: $r_{IP,opinion\ adjusted} = r_{IP,market} + \frac{Cov\left(r_{IP,GM}\right)}{Var\left(r_{IP}\right)}\delta_{GM} = 0.86\%$

Should be: $r_{IP,opinion\ adjusted} = r_{IP,market} + \frac{Cov\left(r_{IP}, r_{GM}\right)}{Var\left(r_{GM}\right)}\delta_{GM} = 0.86\%$

[1] Page 367: The screen clip has a mistake in the formulas in B29:B33. Should be:

	A	B	C	D	E	F
25	Risk-free rate	5.00%				
26	Expected return on S&P 500	12.00%				
27						
28	**Black-Litterman implied returns**					
29	**S&P 500**	12.00%	<-- {=MMULT(B14:F18,H4:H8)*(B26-B25)/INDEX((MMULT(B14:F18,H4:H8)),1,1)+B25}			
30	**MSCI World ex-US**	12.97%				
31	**Russell 2000**	13.30%				
32	**MSCI Emerging**	14.45%				
33	**LB Global aggregate**	5.76%				

[1] Page 367, four lines up from bottom. The same mistake should be corrected:

Instead of:

=MMULT(B14:F18,H4:H8)*(B26-B12)/INDEX((MMULT(B14:F18,H4:H8)),1,1)+B12

Should be:

=MMULT(B14:F18,H4:H8)*(B26-B25)/INDEX((MMULT(B14:F18,H4:H8)),1,1)+B25

[1] Page 402: Cell B9 in the spreadsheet should be $\sigma\sqrt{T}$. For the particular example given this makes no difference, but to make things correct:

	A	B	C
1	**QUANTILES FOR LOGNORMAL DISTRIBUTION**		
2	Initial value, V_0	100	
3	Mean, μ	10%	
4	Sigma, σ	30%	
5	Time period, T	1	<-- in years
6			
7	**Parameters of normal distribution of ln(V_T)**		
8	Mean	4.6602	<-- =LN(B2)+(B3-B4^2/2)*B5
9	Sigma	0.3000	<-- =B4*SQRT(B5)
10			
11	Cutoff	52.576	<-- =LOGINV(0.01,B8,B9)
12	VaR at 1% level	47.424	<-- =B2-B11

[1] Page 404, screen from spreadsheet contains wrongly-identified cells (the actual computations are correct). Screen should be:

	A	B	C	D	E	F	G	H
1	**VaR FOR 3 ASSET PROBLEM**							
2		**Mean returns**		**Variance-covariance matrix**				**Portfolio proportions**
3	Asset 1	10%		0.10	0.04	0.03		0.30
4	Asset 2	12%		0.04	0.20	-0.04		0.25
5	Asset 3	13%		0.03	-0.04	0.60		0.45
6								
7	Initial investment	100						
8	Mean return	0.1185	<-- {=MMULT(TRANSPOSE(B3:B5),H3:H5)}					
9	Portfolio sigma	0.3848	<-- {=SQRT(MMULT(MMULT(TRANSPOSE(H3:H5),D3:F5),H3:H5))}					
10								
11	Mean investment value	111.8500						
12	Sigma of investment value	38.4838						
13								
14	Cutoff	22.3234	<-- =NORMINV(0.01,(1+B8)*B7,B9*B7)					
15	Cumulative PDF	0.01	<-- =NORMDIST(B14,B11,B12,TRUE)					
16	VaR at 1.00% level	77.6766	<-- =B7-B14					
17								
18		Note that the functions in cells B8 and B9 are array functions: You must press [Ctrl]+[Shift]+[Enter] when after you write the function in the cell. The curly brackets {} are not written--they appear automatically.						

[1] Disk, pages 485-488: Tabs wrongly numbered!

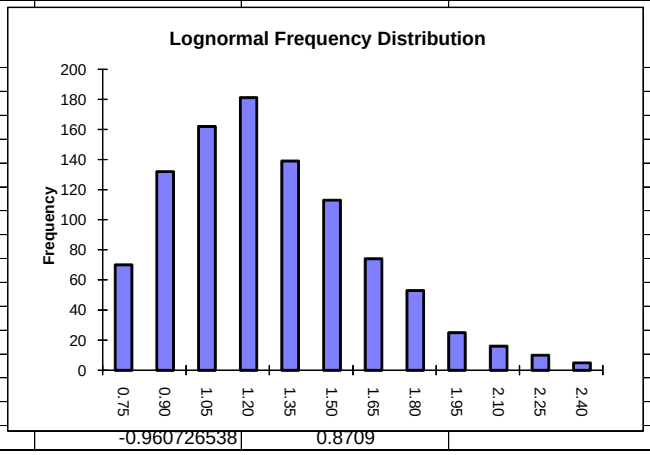
[1] Page 492, footnote 4:

Instead of: $\frac{dS}{S} = \mu\, dt + \sigma dB$

Should be: $\frac{dS}{S} = \left(\mu + \frac{\sigma^2}{2}\right) dt + \sigma dB$

[1] Page 496, correct screen clip given below (was a typo in cell F3):

	A	B	C	D	E	F	G	H	I
1	**The Lognormal Histogram**								
2				**List of 1000 normally distributed numbers**	**Lognormal exp(μΔt+σ Z √Δt)**			**Bins**	**Frequency**
3	Mean	15%		0.726111011	1.4446	<-- =EXP($B$3*$B$5+$B$4*D3*SQRT($B$5))		0.00	0
4	Sigma	30%		-0.75691446	0.9258			0.15	0
5	Δt	1		0.054451448	1.1810			0.30	0
6				1.616244845	1.8868			0.45	0
7				-0.009147243	1.1587			0.60	8
8				1.130981673	1.6312			0.75	70
9				2.550623321	2.4972			0.90	132
10	We used **Tools|DataAnalysis|**			-0.230678552	1.0842			1.05	162
11	**RandomNumberGeneration** to			1.092166713	1.6123			1.20	181
12	produce the list of 1,000 normally distributed random numbers (with							1.35	139
13	mean =0 and standard deviation =							1.50	113
14	1) on the right.							1.65	74
15								1.80	53
16								1.95	25
17								2.10	16
18								2.25	10
19								2.40	5
20									
21									
22									
23									
24									
25									
26									
27									
28				-0.960726538	0.8709				



The table above created with the array formula {=FREQUENCY(E3:E1002, H3:H19)}

[1] Page 505, footnote:

Instead of: " is discussed in Chapter 30, section 3 "

Should be: " is discussed in Chapter 29, section 4 "

[2] Page 519: In the VBA box "CallOption" should be "BSCall" so that line 6 should be:

Instead of: `If CallOption(Stock, Exercise, Time, Interest,`

Should be: `If BSCall(Stock, Exercise, Time, Interest,`

[1] Page 538, cell C3 should say "Exercise price" instead of "Exercise prie":

	A	B	C
1	**"BANG FOR THE BUCK" WITH OPTIONS**		
2	S	25	Current stock price
3	X	25	Exercise price
4	r	6.00%	Risk-free rate of interest
5	T	0.5	Time to maturity of option (in years)
6	Sigma	30%	Stock volatility
7			
8	d_1	0.2475	<-- (LN(S/X)+(r+0.5*sigma^2)*T)/(sigma*SQRT(T))
9	d_2	0.0354	<-- d_1-sigma*SQRT(T)
10			
11	$N(d_1)$	0.5977	<-- Uses formula NormSDist(d_1)
12	$N(d_2)$	0.5141	<-- Uses formula NormSDist(d_2)
13			
14	Call price	2.47	<-- S*$N(d_1)$-X*exp(-r*T)*$N(d_2)$
15	Put price	1.73	<-- call price - S + X*Exp(-r*T): by put-call parity
16			
17	Call bang	6.0483	<-- =B11*B2/B14
18	Put bang	5.8070	<-- =NORMSDIST(-B8)*B2/B15

[1] Page 750, 4th line from bottom:

Instead of: `d4raw`

Should be: `draw`

(the program on the disk is correct)

[1] Page 886: The apostrophe in front of the extension of line 9 should be removed:

Instead of: `‘(n-1)*n`

Should be: `(n-1)*n`

[1] Page 889, second function box. The second commented expression should parallel the one previous:

Instead of:

```
'Make the
'function return
#Num!
```

Should be:

```
'Make the function
'return #Num!
```

[2] Page 890, exercise 6: The screenclip should be replaced by the following:

	A	B	C	D	E	F
1	**Exercise 6**					
2	Deposit	Years	FT0	FT1		
3	100	1	110	125	113.636	<-- =Bond(A3,B3,C3,D3)
4	100	2	110	100	110.494	<-- =Bond(A4,B4,C4,D4)
5	100	12	2500	5000	200.000	<-- =Bond(A5,B5,C5,D5)
6	100	12	225	1387.5	616.680	<-- =Bond(A6,B6,C6,D6)
7	150	5	3400	2500	192.504	<-- =Bond(A7,B7,C7,D7)

There is also a mistake in the VBA of the answer on the disk. The "12 * Years " should have been enclosed in parentheses. This has been corrected on the disk.

```
Function Bond(Deposit, Years, FT0, FT1)
    Temp1 = Deposit + Deposit * (FT1 - FT0) / FT0
    Temp2 = Deposit * (1 + 0.05 / 12) ^ (12 * Years)
    If Temp1 > Temp2 Then Bond = Temp1 Else Bond = Temp2
End Function
```

[2] Page 1089: The promised files didn't make it to the disk. I've posted them here (they will be added to the disk starting with the third printing).

- fm3_chapter41_var_cov.doc
- fm3_chapter41_var_cov.xls