Errata for 7th Edition of Exam FM/2 Manual
(Last updated 1/22/10)

[5/13/08] Page 30, Q. 7, 3rd line. On the right-hand side of the AV, 1,000 should be ***1,300.***

[5/13/08] Page 98, two lines under the diagram. The expression (s double-dot angle 4 plus 1) should be deleted. This is a correct expression for the AV of the annuity.

[5/13/08] Page 108, solution to Q. 1. If you are puzzled by the statement that "Each 1000 will provide for 9.65 of income at the beginning of each month starting on his 65th birthday until the end of his life", you are not alone. Many students don't know what this means. The statement refers to what is known as a ***life annuity,*** i.e., an annuity that is paid to someone for as long as he or she lives, rather than for a fixed or certain number of periods. (Obviously, the PV of a life annuity depends on mortality rates as well as the interest rate.)

Life annuities are covered in later actuarial exams, so it might be considered unfair to include this question in an FM/2 exam. However, there is actually enough information given in the question, if properly interpreted, for an FM/2 student to answer it.

A life annuity is a product sold by life insurance companies. What the statement means is this: If the man pays the insurance company $1,000 on his 65th birthday, the company will guarantee to pay him $9.65 at the beginning of each month for as long as he lives. In this problem, the man wants to receive *$3,000* per month for life starting at age 65. If $1,000 would guarantee $9.65 per month, how much does he have to pay the company to guarantee $3,000 per month?

One way to look at this is to note that if $1,000 guarantees $9.65 per month, then $1,000/9.65 guarantees $1.00 per month. So to guarantee $3,000 per month, we multiply this by 3,000:

Amount to be paid at age 65 to guarantee a monthly life income of $3,000

= (3,000)($1,000/9.65)

[1/22/10] Page 125, solution to Q. 18, first line. On the right-hand side of the equation, the term of the annuity should be 20, not 10. The correct term is used in the solution.

[5/26/08] Page 295, solution to Q. 33. The expression on the left-hand side of the first equation should be v^{292}/v^{291}. However, the exponents of v do not actually have to be determined in order to solve this problem. We know that successive principal repayments are in geometric progression, with common ratio (1 + j), where j is the effective monthly rate. Since the portion of the payment due on 9/30/97 that is interest is .94473, the portion that is principal is 1 - .94473 = .05527. Similarly, the portion of the payment due on 10/31/97 that is principal is 1 - .94418 = .05582. Thus, .05582/.05527 = 1 + j, etc.

[4/23/09] Page 416, 10th line, "Second condition". d/di was omitted just before $(1 + i)^{-n}$.

[1/22/10] Page 418, just above the last inequality, sentence beginning "But the first condition … ". This sentence should read "But the second condition of Redington immunization is that $P_A' = P_L'$ … ".

[1/22/10] Page 453, first sentence. Add "which does not pay dividends" to the end of this sentence.

[1/22/10] Page 456, footnote 1. Revise the first sentence to read: "We are going to assume that the forward price for a non-dividend-paying stock is determined as the current spot price of $100 accumulated with interest at the risk-free rate."

[1/22/10] Page 479, Section 13c, 3rd sentence beginning "For this reason … ". Delete "For this reason" and insert "If we own the underlying asset". Also, in the "Conclusion" two sentences later, add "in the underlying asset" at the end of the sentence.

[4/23/09] Page 483, Item (1)(a). Should say "in which the short position is obligated to ***sell***", not "buy".

[1/22/10] Page 490, last column of the table ("Position"). Add "in Underlying Asset" to the heading.

[1/22/10] Page 491, 3rd line. In the parentheses, add "at expiration". 4th line. Add "in the underlying asset" at the end of the paragraph.

[1/22/10] Page 491, 8th line. In the parentheses, add "at expiration". At the end of the next sentence, add "in the underlying asset".

[1/22/10] Page 491, Section 14c, 2nd line. Add "at expiration" just after "spot price".

[1/22/10] Page 492, table at the top of the page. In the first column, the position shown in parentheses is with respect to the *underlying asset.*

[1/22/10] Page 492, solution to Example 1. The positions shown in parentheses in (I), II), (III) and (IV) are with respect to the *underlying asset.*

[1/22/10] Page 493, table in the middle of the page. In the first column, the position shown in parentheses is with respect to the *underlying asset.*

[1/22/10] Page 495, Section 14e, 3rd, 4th and 5th paragraphs. Replace these paragraphs by the following three paragraphs:

> "Suppose we have a short position in an asset (for example, we sell the asset short). We would lose money if the price of the asset increases. If we buy a call, it's insurance against price increases, since the payoff under the long call increases as the price of the underlying asset increases. Thus, we can say that the strategy behind a long call (when we have a short position in the underlying asset) is insurance against a high price."
>
> "A written call is like selling insurance against a high price."
>
> "As we saw in Section 13c, a long put is insurance against a decrease in the price of the underlying asset. Thus, we can say that the strategy behind a long put (when we have a long position in the underlying asset, such as when we own it) is insurance against a low price."

[1/22/10] Page 497, 7th bullet (Taxes), 4th line. Delete "spot price at the time of exercise" and replace by "strike price".

[1/22/10] Page 507, 1st paragraph. Add the following sentence to the end of the paragraph: "We will assume that the underlying asset does not pay dividends.

[1/22/10] Page 520. Just before Q.1, insert the statement: "Assume that any stocks in the following questions do not pay dividends."

[4/23/09] Page 521, Q. 13. Assume that interest is credited on the proceeds of the short sale.

[1/22/10] Page 522, Solution to Q. 2. Add the following note after the solution:

> In Section 16b, we will cover a very important principle in option pricing known as ***put-call parity.*** You will find that using this principle, it is possible to determine X (the

premium for a 48-strike call) directly:

Put-call parity: Call(K, T) – Put(K, T) = S_0 – PV(K)
Call(48, 1 year) – 4.18 = 48 - $(1.066^{-1})(48)$
Call(48, 1 year) = 48 – 45.03 + 4.18 = 7.15 (rounding difference)

Put-call parity could also be used to solve several other problems in this set.

[1/22/10] Page 539, Q. 1, 1st line. After "forward contract", insert "with a non-dividend-paying stock as the underlying asset and". Also, delete the sentence beginning "The risk-free rate …", since this information is not required.

[5/16/08] Page 539, Q. 5. A "1:3 ratio spread" is ambiguous. (In the financial literature, the ratio spread intended by this question is sometimes designated as a "1:3 ratio spread" and sometimes as a "3:1 ratio spread".) For this reason, change the question to read as follows: "A ratio spread using 90-strike and 110-strike options, with a payoff of 20 at a spot price at expiration = 110, and a payoff of 0 at a spot price at expiration = 120."

[1/22/10] Page 541, solution to Q. 1. Replace the solution by the following:

The combination of a long call and a short put with a strike price of K creates a synthetic forward with a forward price of K. The premium for this off-market forward is equal to the net premium for the long call and short put. Thus in this problem we have:

32.98 – X = 18.18
X = 14.80

[1/22/10] Page 541, solution to Q. 4. In the note to the solution, delete "borrowing money (with no market risk involved and repaying" and replace by "lending money at the risk-free interest rate and receiving a payment of".

[5/16/08] Page 541, solution to Q. 5. Change the solution to read as follows: "A ratio spread is constructed by buying and selling unequal numbers of options at different strike prices. In order to get a payoff of 20 at a spot price at expiration of 110 and a payoff of 0 at a spot price at expiration of 120 using 90-strike and 110-strike options, we have to buy one 90-strike call option and write three 110-strike call options. The net premium paid for this combination is 21.46 – 3 x 11.33 = -$12.53."

[1/22/10] Page 548, item B near the top of the graph. It should say "after-tax profit at a price of $130 = $32.50", not a price of $110.

[1/22/10] Page 581, 5th line of paragraph beginning "Note that the broker … ". Add "with an outside party" just after "forward or futures contract".

[1/22/10] Page 581, item 1 of the table below the middle of the page ("Arrangement #4"). Delete the last sentence beginning "(Broker's short forward …)" and replace by "(Broker's short position in the forward contract with the buyer is offset by broker's long position in another forward contract with an outside party.)"

[1/22/10] Page 594, solution to Q. 8. The symbol f_2 as used in this solution represents the annual effective interest rate for the 2-year period from t = 1 to t = 3. (This is not how f_2 was defined in the text of the manual.)

[1/22/10] Page 638, solution to Q. 29. On the 3rd line, a division bar was omitted from the 2nd term on the left-hand side of the equation, which should read: $51.21/(1 + x)^2$. On the 4th line, the factor (1.09) should be (1.29). The result for 1 + x is correct.

[4/23/09] Page 648, solution to Q. 27. The correct answer is ***(A)***, not (C).

[4/23/09] Page 656, solution to Q. 4. The buy-sell transaction results in a ***loss*** of 47.19. The correct answer is (E), not (A).

[4/23/09] Page 659, solution to Q. 24, 4th line. The last term should be $\boldsymbol{1000v^3_i}$, not $1120v^3_i$.