

Errata for 8th Edition of Exam FM/2 Manual (Last updated 8/13/10)

[7/17/11] Important note on immunization! Students have reported that there have been a surprising number of questions on immunization (including the topics of duration and convexity) on recent exams. The 5 practice exams in this manual contain very, very few questions on these topics. We suggest that you thoroughly review Sections 9c to 9n before you take the exam.

[4/28/10] Page 20, Q. 7. This problem should really appear at the end of Sections 1a(vi) to 1a(ix).

[7/17/11] Page 109, solution to Q. 7, 2nd line. $R = 150.80$ (based on the number of decimal places used), not 150.08. The solution is based on the correct value.

[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.

[8/13/10] Page 124, solution to Q. 7. On the last line, the denominator should be $1 - .71315$. The answer is based on the correct denominator.

[8/13/10] Page 194, solution to Q. 11. The way the question is worded, the correct answer is (A), not (B). As noted in the solution, the account balance at the end of the 8th year is \$46,921.66. Just after the 17th full scholarship of \$5,000 is awarded, the account balance is equal to $(46,921.66)(1.08)^{17} - 5,000(s \text{ angle } 17)$ at 8% = \$4,859.86. According to the question, if there is less than \$5,000 in the account at the end of any year, the remaining amount (\$4,859.86) is immediately awarded as a smaller scholarship. Thus, only 17 full scholarships of \$5,000 are awarded. Note that the account balance of \$4,859.86 at the end of the 17th year would have grown to \$5,248.65 at the end of the 18th year at 8%. This would have permitted an 18th full scholarship to have been awarded, but this would not follow the requirements of the question.

[7/17/11] Page 276, first line under “b. Using the TVM registers”. 4,329.48 should be 4,329.38.

[7/17/11] Page 402, 11 lines from the bottom. Add the following sentence to the parenthesis: “In fact, in “Notation and terminology used for Exam FM/Exam 2”, which you can find on www.BeAnActuary.org, the SOA/CAS says that, unless otherwise stated, “duration” means Macaulay duration.”

[7/17/11] Page 404, solution to (c), 3rd line. The reference to footnote 2 should be to footnote 3.

[4/23/09] Page 416, 11th line, “Second condition”. d/di was omitted just before $(1 + i)^n$.

[1/22/10] Page 418, just above the middle of the page, sentence beginning “But the first condition ... “. This sentence should read “But the second condition of Redington immunization is that $P_A' = P_L' \dots$ “.

[7/17/11] Pages 442-443, “What about interest?” The 8th edition says that interest on the proceeds of a short sale is normally not paid. However, since McDonald was added to the syllabus, you should assume that this interest *is* paid, unless stated otherwise. This was confirmed by a reply to a student’s email sent in 2010 to the SOA. A number of questions on the 5 practice exams in this manual are based on the “no-interest” assumption. See the errata list below for pages 616 and subsequent.

- [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.”
- [7/17/11] Page 457, Fig. 11.2 and page 459, Fig. 11.3. The line showing the payoff on the long forward should intersect the y axis at -104, not -100.
- [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 on page 480, 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 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:

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

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.

[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:

$$\begin{aligned}32.98 - X &= 18.18 \\ X &= 14.80\end{aligned}$$

[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”.

[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.

[7/17/11] Page 551, table at the top. The first 4 entries in the column headed “Profit on 100-110 Collar” should end in .30, not .26 or .36. The next 3 entries in this column should end in .70, not .74. All of the entries in the “Combined Profit” column should end in .30, not .26.

[4/28/10] Page 555, Q. 3. The problem should have made it clear that X and Y represent the highest and lowest profit, respectively, if the puts are *purchased*.

[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 “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.)”

[7/17/11] Page 584, the line just before Section 19d. The result of the calculation is \$7.55, not \$7.51.

[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.)

[7/17/11] Page 599. We suggest that you do Practice Exams 4 and 5 first, since most students think they are easier than Practice Exams 1 to 3.

[4/28/10] Page 610, solution to Q. 20, last 2 lines. 1035.45 should be 1030.45. The final solution of 10.36 is correct.

[7/17/11] Page 616, Q.11, page 632, Q.7, page 648, Q. 23 and page 662, Q. 27. All of these questions should say that you should assume that no interest is paid to the short-seller on the proceeds of the short sale. Note that if this is not stated, you should assume that this interest *is* paid.

[4/23/09] Page 619, Q. 32, 3rd line. “2007” should be “**2008**”.

[1/22/10] Page 642, 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.

[7/17/11] Page 643, solution to Q. 34, 3rd equation. The number in the angle-bracket should be 282 (= 360 – 78), not 360. The result is based on the correct value.

[4/28/10] Page 647, Q. 15. The put options in this problem are priced incorrectly, since the premiums should increase as the strike price increases. The solution is based on the premiums as shown.

[4/23/09] Page 649, Q. 33. The first bullet should read $K_c = K_p - 20$.

[7/17/11] Page 661, Q. 19. The question should ask for the non-zero value of X.

[4/28/10] Page 661, Q. 20. The question should make it clear that the production cost of 17.50 is incurred at the time of sale, i.e., one year from now.

[7/17/11] Page 662, Q. 23. The question should make it clear that the bond was originally purchased to yield a *minimum* of 8%. Also, it should say that the bond matures at par in 30 years.

[8/13/10] Page 667, solution to Q. 17. On the last line, P should be equal to 122,215.3. The answer is still (D).

[7/17/11] Page 768, solution to Q. 23. To find the price at which the bond was originally purchased to yield a minimum of 8%, we must find the lowest price for all possible redemption dates. The price assuming maturity at par in 30 years, as shown in the solution, is \$943.711. If we assume that the bond is called at \$1,050 at the end of 6 to 29 years, the price would be greater than \$943.711. (This can be seen by looking at the premium/discount formula for the price, or by a couple of trial calculations.) Thus, the original price was \$943.711, as shown in the solution.

[4/23/09] Page 668, solution to Q. 24, 4th line. The last term should be $1000v_i^3$, not $1120v_i^3$.