Errata and Updates for the 2022 ACTEX Manual for Exam FM

(Last updated 3/7/2023) sorted by page

Page 21 **Example (1.47), last formula.**
Insert an additional item in the series of equal expressions:

$$a(t) = e^{\int_0^t \delta(u)du} = e^{2\ln(t+1)} = \left(e^{\ln(t+1)}\right)^2 = (t+1)^2$$

Page 77 **First line.**
PV should be negative:

$$\text{PV} = -19{,}598.63$$

Page 115 Formula (2.133) should have a continuous bar over a angle n in the numerator of RHS:

$$\boxed{\left(\bar{I}\bar{a}\right)_{\overline{n}|} = \frac{\bar{a}_{\overline{n}|} - n \cdot v^n}{\delta}}$$

Page 162 **Problem 8.**
Change the choices to

(A) 75.82 (B) 78.06 (C) 80.37 (D) 82.75 (E) 85.19

Page 166 **Solution to Problem 8.**
In the last line of the 3rd paragraph, change 95.53 to 151.94, then make that same change (95.53 to 151.94) in the 4th paragraph, and also change 23.96 to 80.37 in the 4th paragraph.

Page 169 **Solution to Problem 15, first two equations.**
The numbers 1.082 (in the first equation) and 1.086 (in the second equation) should both be 1.08:

$$X \cdot (1 + 2 \cdot i) = 1{,}000 \times 1.08^2 = 1{,}166.40$$
$$X \cdot (1 + 6 \cdot i) = 1{,}000 \times 1.08^6 = 1{,}586.87$$

Page 241 **Solution to Problem 8, fourth equation from the end.**
Delete the "$F+$" at the beginning of the equation. It should be:

$$F(r-i)a_{\overline{2n}|i} = 1,000 \cdot \frac{12\% - 10\%}{2} \cdot a_{\overline{2n}|5\%} = 10 \cdot a_{\overline{2n}|5\%}$$

Page 274 **Solution to Problem 4, third paragraph.**
C02 should be negative:

$$\text{C02} = -300$$

Page 297 **Solution to Problem 4, last paragraph.**
The numerator of the 3rd fraction should be 1,060, not 60:

$$\frac{60}{1.0865} + \frac{60}{1.085^2} + \frac{1,060}{1.0805^3} = 946.49$$

Page 316 **Sentence before Example (7.38).**
The sentence should refer to "the negative of the first derivative":

In other words, Macaulay duration is the negative of the first derivative of price with respect to the force of interest, expressed as a percentage of price.

Page 352 **Solution to Problem 2, first equation.**
Delete the "x" that appears at the beginning of the equation. The equation should be:

$$P(i) = \frac{Div}{i}$$

Page 367 **Problem 10, 3rd line.**
The line should read as follows:

Given that the 4-year spot rate is 4.9%, what is the 5-year spot rate?

Page 373 **Solution to Problem 10, 2nd paragraph, 3rd line.**
The expression in this line should be an equality. Change the second minus sign to an equals sign:

$$100 - 19.16 = 80.84$$

Page 496 **Solution to Problem 5, 2nd paragraph, 5th line.**
12,697.50 should be 12,967.50:

$$20 \times 648.375 = 12,967.50$$

Page 499 **Solution to Problem 17, equation after 2nd paragraph.**
The subscript of s should be $n+1$:

$$\ddot{s}_{\overline{n}|} = s_{\overline{n+1}|} - 1$$

Page 500 **Solution to Problem 20, last equation.**
P should have a coefficient of 2:

$$\text{Bal}_8 = 2 \cdot P \cdot a_{\overline{2}|} = 2 \times 1,060.73 \cdot (1.08^{-1} + 1.08^{-2}) = 3,783.13$$

Page 501 **Solution to Problem 23, equation before the final vparagraph.**
Adjust the parentheses in the denominator to make the calculation clearer:

$$P = (8,000 - 1,165.49(2.6485))/(4.1557 \times 1.065^{-3}) = 1.428.15.$$

Page 503 **Solution to Problem 27, last paragraph, 2nd line.**
The value of PMT should be negative:

$$\text{CPT PMT} = -4{,}118.93$$

Page 525 **Problem 16 has no multiple choice answers.**
Insert the following answer choices:

(A) 7,695 (B) 7,756 (C) 7,805 (D) 7,856 (E) 7,905

Page 530 **Solution to Problem 10, last equation.**
The 182 in the denominator should be 95. (Also, there is an extraneous second solution.):

$$i = (-182 \pm \sqrt{182^2 - 4 \times 95 \times (-13)})/(2 \times 95) = 0.06895, -1.9847$$

Only the first value is valid. (i can't be less than -1.)

Page 535 **Solution to Problem 25, first equation after sentence that begins 'Subtracting."**
Insert v^3 after B_3:

$$2 \cdot B_3 \cdot v^3 = 1,000 \cdot v^2$$

Page 547 **Solution to Problem 10, equation following the 3rd sentence.**
Delete "$= 0$" at the end of the equation, leaving:

$$1,000x^4 = 500x^3 + 600x^2$$

Page 570 **Solution to Problem 19, last sentence of first paragraph.**
Change 1,000 to 10,000:

. . . 9,000 in the 10th year, and then 10,000 at the end of the 10th year . . .

Page 589 **Solution to Problem 22, item C, 2nd line.**
Change 1,00 to 1,100:

$$1,100v^{30}$$

Page 589 **Solution to Problem 22, item E, 4th and 5th lines.**
Change "20-year" to "10-year":

paid in the third 10-year period

Page 613 **Problem 12 answer choices.**
Change answer choice (D) to 6.1% and change answer choice (E) to 6.3%.

Pages 621 and 622 **Solution to Problem 12.**

- Correct the table values for Year 3:
  The Spot Rate and PV Factor should be 5.39% and 0.8543, respectively.

3	5.39%	0.8543

- Adjust the equations to reflect the corrected values:

$$(0.9615 + 0.9096 + 0.8543 + 0.8048 + 0.7536) \times 100 \cdot r + 0.7536 \times 100 = 100$$

$$r = \frac{1 - 0.7536}{0.9615 + 0.9096 + 0.8543 + 0.8048 + 0.7536} = 0.05751$$

Next calculate the sale price of the bond. After two years, the bond has a remaining term of 3 years, so the price is:

$$(0.9615 + 0.9096 + 0.8543) \times 100 \times 0.05751 + 0.8543 \times 100 = 101.10$$

- The last line should be:

CPT I/Y = 6.285.

Page 628 **Solution to Problem 27, 4th equation from the end.**
Change 1,1683.3600 to 1,683.3600:

$$2.5 \cdot P = 917.4312 \times 1 + 1,683.3600 \times 2 + \frac{X}{1.09^3} \times 3$$

Page 645 **Solution to Problem 18.**
The solution is incomplete. Add the following material to what is shown in the manual:

We can find the value of v by solving the quadratic $42 \cdot v^2 - 12 \cdot v - 26 = 0$.

The positive root is $v = 0.94252$. (Note that v cannot be negative).

So i is: $i = \frac{1}{v} - 1 = \frac{1}{0.94252} - 1 = 0.0610$

Answer C

Page 648 **Solution to Problem 26, last equation.**
The fraction in parentheses should be raised to the 1/28 power:

$$i = 4 \cdot \left[\left(\frac{800}{500 \cdot (1 + j/12)^{24}} \right)^{\frac{1}{28}} - 1 \right] = 0.050616$$

Page 663 **Solution to Problem 9, first paragraph, 5th line.**
Change 38.7358 to 37.7358:

$$37.7358 \times 60 = 2,264.15$$

Page 701 **Problem 12, first sentence.**
Change "equal face values" to "face values of 100":

Two newly-issued 15-year bonds have face values of 100 and equal yields to maturity.

Page 736 **Solution to Problem 25, first sentence.**
Change "Kevin's" to "Devon's":

150% of Devon's payments

Page 736 **Solution to Problem 26, 3rd paragraph, 2nd line.**
The denominator of the fraction should be 1.06^2 (not 1.06):

$$8,292.03/1.06^2 = 7,379.88$$

Page 738 **Solution to Problem 28, next-to-last equation.**
Replace the last 2 lines of equations with the following 3 lines:

$$82((1.076^{15}–1)/0.076)(1.076)^{30} + x((1.076^{30}–1)/0.076) = 27,000$$
$$19,430.89 + x \cdot 105.30 = 27,000$$
$$x = (27,000 - 19,430.89)/105.30 = 71.88$$

Page 739 **Solution to Problem 29, equation after 2nd paragraph.**
Change 106 (in the denominator of the second term) to 1.06:

$$1,000 \cdot a_{\overline{5}|6\%} + 3,936.83/1.06^6 = 1,000 \times (1 - 1.06^{-5})/0.06 + 3,936.83/1.41852 = 6,987.68$$

Page 740 **Solution to Problem 30, 2nd line.**
The computed value of PMT should be negative:

CPT PMT = −2,590.09