

Errata and Updates for the 2022 ACTEX Manual for Exam FM

(Last updated 12/01/2022) 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:

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

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
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- 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:

$$\text{CPT I/Y} = 6.285.$$

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:

$$\text{CPT PMT} = -2,590.09$$