

Errata and Updates for ASM Exam IFM (First Edition Third Printing) Sorted by Date

[11/12/2020] On page x, on the third line under the heading “The normal distribution table”, change the link to <https://www.prometric.com/soa>.

[6/15/2020] On page 16, in the solution to exercise 2.12, on the third line from the end, change $\Pr(X > 10000)$ to $\Pr(X > 10000 | X > 8000)$.

[6/3/2020] On page 625, solution to question 28, while the solution is correct, the strangle is a little strange in that the strike price of the call is less than the strike price of the put. So replace the first two sentences with:

A short butterfly spread is a short (K, L) bull spread plus a short (L, M) bear spread, or $P(L) - P(K) + C(L) - C(M)$. A straddle is $C(L) + P(L)$ and a strangle is $C(M) + P(K)$, so (C) works.

[3/15/2020] On page 133, replace the solution to exercise 11.9 with

The tax shield is worth $0.25(100,000,000)(0.06) = 1,500,000$. As usual, we discount this at the interest rate of the loan, or 6%. The present value of the tax shield is than $1,500,000/1.06 = 1,415,094$, or 0.1415094 per share. Since share price went up only 0.10, the value of financial distress is $0.0415094(10,000,000) =$
415,094.

[10/13/2019] On page 113, in the solution to exercise 9.6, on the displayed line, put parentheses around $\frac{1}{1.1} : \left(\frac{1}{1.1}\right)^k$.

[5/28/2019] On page 610, in the solution to question 25, on the second line from the end, change 7,83545 to 7.83545 (change the comma to a period).

[3/24/2019] On page 482, in exercise 30.9, add the following sentence after the second sentence of the second paragraph:

But if these preliminary studies are unfavorable, the probability of success of the drug is 0%.

[3/8/2019] On page 28, exercise 3.22 parametrizes the negative binomial distribution the way it is parametrized on Exams STAM and MAS-I, but this parametrization isn't familiar to someone who hasn't studied for one of those exams. Therefore, replace the first sentence of the question with

The number of claims on a policy in one month has a negative binomial distribution with the following probability mass function:

$$p_n = \binom{2+n}{n} \left(\frac{0.2^n}{1.2^{3+n}} \right)$$

[3/2/2019] On page 615, in the solution to question 11, change the answer key from (B) to (C). Make the same change on page 612.

[2/19/2019] On page 144, 9 lines from the bottom of the page, change “intereset” to “interest”.

[2/14/2019] On page 133, in exercise 11.8, note that you should ignore the tax shield when doing this exercise.

[2/14/2019] On page 133, change the solution to exercise 11.8 to

Market capitalization before the loan is 14,000,000, and the value of the loan is 10,000,000. Thus after the loan $D/E = 10/4$. The equity beta with the loan is

$$\beta_E = 1 + \frac{10}{4}(1-0.2) = 3$$

Therefore the beta of distress costs is $0.03 - 3(0.05) = -0.12$. The expected present value of distress costs (taking into account their probability) is $0.3(1,000,000/(1 - (-0.12))) = 340,909$. Thus the value of equity

decreases by 340,909 as a result of bankruptcy costs. There are $1,000,000 - 10,000,000/14 = 285,714$ shares outstanding after the loan. The new share value is $14 - 340,909/285,714 = \boxed{12.81}$.

[1/14/2019] On page 179, in each of the first two displayed lines of Section 17.2, change Ke^{-rt} to Ke^{-rT} .

[11/12/2018] On page 492, in exercise 31.3, change the five choices to (only (B), (D), and (E) are changed):

- (A) $\int_0^{10} (C(S, 55000, t) + 55,000(1 - e^{-rt}))f(t) dt + F(10)C(S, 50000, 10)$
 (B) $\int_0^{10} (C(S, 50000, t) + 50,000(e^{-rt} - 1))f(t) dt + F(10)(C(S, 55000, 10) + 55000e^{-10r} - 50000)$
 (C) $\int_0^{10} (C(S, 50000, t) + 50,000(e^{-rt} - 1))f(t) dt + (1 - F(10))(C(S, 55000, 10) + 55000e^{-10r} - 50000)$
 (D) $\int_0^{10} (C(S, 50000, t) + 50,000(1 - e^{-rt}))f(t) dt + (1 - F(10))C(S, 55000, 10)$
 (E) $\int_0^{10} (C(S, 55000, t) + 50,000(e^{-rt} - 1))f(t) dt + (1 - F(10))(C(S, 55000, 10) + 55,000e^{-10r} - 50000)$

[11/12/2018] On page 494, on the second line from the end of the solution to exercise 31.3, change 55000 to 50000.

[11/6/2018] On page 65, on the eighth line, replace $f(a, b, \lambda)$ with $h(a, b, \lambda)$.

[11/6/2018] On page 107, the second paragraph discusses NPV, but NPV is not relevant to Modigliani-Miller. Replace the second paragraph with the following two paragraphs:

What is the best combination of debt and equity to finance a project? Which combination maximizes the value of the company's securities? Usually, the cost of debt capital is less than the cost of equity capital. Suppose a company has only one project. The project generates 1.5 million of cash flows per year perpetually. If the cost of equity capital is 15%, then the present value of future cash flows is $1.5/0.15$ million = 10 million. That is the market value of the company's equity.

Now assume the company issues 5 million of bonds to fund the project. The cost of debt capital is 5%, so the company pays annual interest of $0.05(5,000,000) = 250,000$. The annual net cash flows after interest will be $1,500,000 - 250,000 = 1,250,000$. The present value of future cash flows is $1.25/0.15$ million = $8\frac{1}{3}$ million. Thus the total value of the company's equity and debt, its enterprise value, is now $8\frac{1}{3}$ million + 5 million = $13\frac{1}{3}$ million. Seemingly the total value of the company's securities has increased as a result of issuing bonds. However, this assumes that the cost of equity capital is still 15% after the bonds are issued. This assumption is not correct.

[11/6/2018] On the second line of the third paragraph of page 107, change "value of a project" to "value of a company's securities".

[11/6/2018] On page 110, in the box before exercise 9.3, on the second-to-last line, change "the cost of capital is 0.10" to "the cost of equity capital is 0.10".

[11/6/2018] On page 479, in Example 30B, on the third line, change "at that time" to "at the current time".

[11/3/2018] On page 333, in Table 24.2, in the formula for call premium on futures, replace the two t s with T s.

[10/28/2018] On page 607, in the solution to question 13, on the second displayed line, change 0.66589 to 0.42858.

[10/25/2018] On page 165, in exercise 15.8, change the last line to

Determine the lowest price per unit such that the futures contract does not require a margin call.

[10/21/2018] On pages 63–64, Example 5G is defective since the correlation of a stock with the portfolio changes as a stock gets added to it. When solved correctly, it is found that there is no real solution to the question.

Replace the example and its solution with:

EXAMPLE 0A A portfolio consists of \$4000 of Stock A and \$6000 of Stock B. The returns on the two stocks are uncorrelated. The volatility of Stock A is 0.3 and the volatility of Stock B is 0.4

Calculate the contribution of Stock A to the volatility of the portfolio.

SOLUTION: Let A and B the returns on Stocks A and B respectively. The variance of the portfolio is

$$\text{Var}(0.4A + 0.6B) = 0.4^2 \text{Var}(A) + 0.6^2 \text{Var}(B) = 0.4^2(0.3^2) + 0.6^2(0.4^2) = 0.072$$

The covariance of Stock A with the portfolio is

$$\text{Cov}(A, 0.4A + 0.6B) = 0.4 \text{Var}(A) = 0.4(0.3^2) = 0.036$$

The correlation of Stock A with the portfolio is $0.036 / (0.3\sqrt{0.072}) = 0.447214$. The contribution of Stock A to the volatility of the portfolio is $0.4(0.447214)(0.3) = \boxed{0.053666}$. \square

[10/19/2018] On page 487, on the second line of the paragraph containing the displayed line $\int_0^{\infty} P(t)f_{T_x}(t)dt$, change $\max(0, K - S_T)$ to $S_T + \max(0, K - S_T)$, and change “So it is” to “So it contains”.