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

[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 $\Pr(X > 10000 \mid X > 8000)$.

[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:

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

[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 their 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

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

The covariance of Stock A with the portfolio is

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

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 $0.4(0.447214)(0.3) = \boxed{\mathbf{0.053666}}$. □

[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".

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

[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 $14-340{,}909/285{,}714 =$ **12.81**.

[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**.

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

[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.

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

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

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

[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%.

[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".

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

(A) $\int_0^{10}\big(C(S,55000,t)+55{,}000(1-e^{-rt})\big)f(t)\,\mathrm{d}t+F(10)C(S,50000,10)$

(B) $\int_0^{10}\big(C(S,50000,t)+50{,}000(e^{-rt}-1)\big)f(t)\,\mathrm{d}t+F(10)\big(C(S,55000,10)+55000e^{-10r}-50000$

(C) $\int_0^{10}\big(C(S,50000,t)+50{,}000(e^{-rt}-1)\big)f(t)\,\mathrm{d}t+\big(1-F(10)\big)\big(C(S,55000,10)+55000e^{-10r}-50000$

(D) $\int_0^{10}\big(C(S,50000,t)+50{,}000(1-e^{-rt})\big)f(t)\,\mathrm{d}t+\big(1-F(10)\big)C(S,55000,10)$

(E) $\int_0^{10}\big(C(S,55000,t)+50{,}000(e^{-rt}-1)\big)f(t)\,\mathrm{d}t+\big(1-F(10)\big)\big(C(S,55000,10)+55{,}000e^{-10r}-50000$

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

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

[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).

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

[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.