# ACTEX EXAM C STUDY MANUAL – 2007 Edition 2nd Prining

**Errata List, by S. Broverman**
**Updated August 16, 2007**

Aug 16/07 Page ME-243, #10, Line 5 should read
Determine the value of the Nelson-Aalen type estimator of the cumulative hazard rate appropriate for the Cox model

May 11/07 Page SI-48, Example SI-13, solution
Some of the quantiles are incorrect.
.835 should be 1.036 , .575 should be .674 and .136 should be .126

May 7/07 Page SI-51, Problem 6 solution,

$E[S_1 \mid S_1 < 80]$ , should be $$110 \cdot \frac{\Phi\left(\frac{\ln 80 - \ln 100 - (\ln 1.1 + \frac{1}{2}(.16))}{.4}\right)}{\Phi\left(\frac{\ln 80 - \ln 100 - (\ln 1.1 - \frac{1}{2}(.16))}{.4}\right)} = 110 \cdot \frac{\Phi(-1.00)}{\Phi(-.60)} = 63.6$$

and $E[S_2 \mid S_1 < 80] = 1.1(63.6) = 70.0$ .

Also

$E[S_1 \mid S_1 > 125]$ , should be $$110 \cdot \frac{\Phi\left(\frac{\ln 100 - \ln 125 + (\ln 1.1 + \frac{1}{2}(.16))}{.4}\right)}{\Phi\left(\frac{\ln 100 - \ln 125 + (\ln 1.1 - \frac{1}{2}(.16))}{.4}\right)} = 110 \cdot \frac{\Phi(-.12)}{\Phi(-.52)} = 165.0$$

and $E[S_2 \mid S_1 > 125] = 1.1(165.0) = 181.5$

May 12/07 Page SI-51, Problem 8 solution, answer should be 8.3 (not 5.6)

May 12/07 Page SI-52, Problem 10 solution, in line 1 , 1/16 should be 6.25%
In line 3, .434 should be .489 and .157 should be .156

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May 12/07 Page SI-62, Problem 4 solution should be as follows, last line, answer should be 111.66

The model for the stock price at time 2 is

$$\hat{S}_2 = S_0 e^{(\alpha-\lambda k-\frac{1}{2}\sigma^2)(2)+\sigma\sqrt{2}Z} \cdot e^{m(\alpha_J-\frac{1}{2}\sigma_J^2)+\sigma_J\sum_{i=1}^{m} W_i} .$$

For this model, $\lambda = 1$ is the average number of jumps per year.

*m* has a Poisson distribution with a mean of $\lambda h = 1 \times 2 = 2$ jumps in 2 years.

$k = e^{\alpha_J} - 1 = e^{.05} - 1 = .051271$ and $e^{\alpha} = 1.1$.

We are also given $\sigma = .4$ , $\sigma_J = .2$ and $\delta = 0$. Substituting in these values results in

$$\hat{S}_2 = 100(1.1)^2 e^{(-.0513-\frac{1}{2}(.16))(2)+.4\sqrt{2}Z} \cdot e^{2(.05-\frac{1}{2}(.04))+.2\sum_{i=1}^{2} W_i} \quad \text{(since } e^{\alpha} = 1.1\text{)}.$$

The uniform value .61 simulates a standard normal *Z* of .279.

The cdf of the Poisson distribution with mean 2 is

$F(0) = .1353, F(1) = .4060, F(2) = .6767$ , so the uniform number .65 simulates $m = 2$ jumps, so we need two standard normal $W_i$ 's. The uniform value .89 simulates $W_1 = 1.23$ and .17 simulates $W_2 = -.954$ . The simulated stock price is

$$121 e^{(-.0513-\frac{1}{2}(.16))(2)+.4\sqrt{2}(.279)} \cdot e^{2(.05-\frac{1}{2}(.04))+.2(1.23-.954)} = 122.27 .$$

May 15/07 Page SI-62, #5 solution, in line 6, $e_2$ in the exponent should be $\varepsilon_2$

May 15/07 Page SI-66, Example SI-17, 2nd last line, 5 should be 20

May 8/07 Page PE-248, #8, Answer E should be 768

May 8/07 Page PE-258, #8 solution, last line should be

$= 18 + 25(6) + 100(6) = 768.$ Answer: E