**RSM 8301, Winter 2024, Assignment 2, Due April 5, 2024**

1. An individual divides an investment between hedge funds that earn (before fees) -21%, -11%,

+21%, +25%, +27%, and +31%. All hedge funds charge 2 plus 20%. What is the overall return on the investments? How is it divided between the hedge fund and the investor? How does your answer change if a fund of funds charging 1 plus 5% is used. (Assume that a hedge fund’s incentive fee of 20% is paid on profits net of the management fee. The fund of fund incentive fee of 5% applies to the total profits, net of management fees, from the hedge funds.)

2. How does Table 7.1 in text change if the principal assigned to the senior, mezzanine, and equity tranche in Figure 7.4 are 72%, 22%, and 6% for the ABS and 70%, 25% and 5% for the ABS CDO?

3. Variable *x* has a uniform distribution with values between 5 and 15 being equally likely. Variable

*y* has a Pareto distribution. A Gaussian copula is used to define the correlation between the two

distributions. The Pareto distribution for variable *y* has a probability density function

*aca/ya +1*

for values of *y* between *c* and infinity where *c* = 4 and *a* = 0.5. Produce a table similar to Table 9.5 in the text considering values of *x* equal to 7, 9, 11, and 13 and values of *y* equal to 5, 10,

30, and 60. Assume a copula correlation of 0.4. A spreadsheet for calculating the cumulative

bivariate normal distribution is on the author’s website. See:

www-2.rotman.utoronto.ca/~hull/riskman

4. Five years of history for the S&P 500 is attached. March 2020 was a volatile period for the index. Imagine that it is March 13, 2020. Use the previous 251 days (250 percentage changes) to calculate the one-day value at risk and expected shortfall for a portfolio with $1,000 invested in the index. Ignore dividends. Provide results for four different methods:

1. The basic historical simulation approach
2. Exponential weighting with =0.995
3. Volatility scaling with =0.94 (assume an initial variance equal to the sample variance for the 250 changes)
4. Extreme value theory with *u* = 25