

MATH4/68181: Extreme values and financial risk
Semester 1
Problem sheet for Week 5

Suppose a portfolio is made up of two assets with X and Y denoting the corresponding prices. Suppose also that the joint distribution of X and Y is specified by the survival function

$$\bar{F}(x, y) = \left[1 + \frac{x}{a} + \frac{y}{b}\right]^{-c}$$

for $x > 0$, $y > 0$, $a > 0$, $b > 0$ and $c > 0$. Find the following:

1. the cdf of $M = \max(X, Y)$;
2. the pdf of M ;
3. the n th moment of M ;
4. the mean of M ;
5. the variance of M ;
6. the cdf of $L = \min(X, Y)$;
7. the pdf of L ;
8. the n th moment of L ;
9. the mean of L ;
10. the variance of L .