Risk Management

Suppose a company has cash needs of $b_1$, $b_2$, and $b_3$ at the beginning of periods 1, 2, and 3, respectively, and decides to borrow money at the market. At the beginning of period 4 the company will be in the position to pay back all debts incurred from the borrowing. The interest rate for money borrowed at the beginning of period $i$ to be returned at the beginning of period $j$ is $a_{ij}$, where money can be borrowed over 1, 2, and 3 periods. (For example, if the company borrows $1$ at the beginning of period 2 over 2 periods, it has to pay back $(1 + a_{24})$ at the beginning of period 4.)

1. Assume all interests are given and formulate a model that minimizes all borrowing costs.

2. Assume that interest rates from period 2 on are uncertain. Formulate a model for managing the risk associated with the borrowing.

3. What kind of utility function could one use?