

$$\begin{aligned} \left(1 + \frac{r}{m}\right)^m &= 1 + \cancel{m} \frac{r}{\cancel{m}} + \frac{m(m-1)}{2m^2} r^2 + \dots \\ &\leq 1 + r + \end{aligned}$$

$$\begin{aligned} \frac{m(m-1)}{2m^2} &= \frac{1 - \frac{1}{m}}{2} \\ m < k &\rightarrow \frac{1}{m} > \frac{1}{k} \\ &\quad -\frac{1}{m} < -\frac{1}{k} \end{aligned}$$

$$\frac{1 - \frac{1}{m}}{2} < \frac{1 - \frac{1}{k}}{2}$$

We deduce that

$$\left(1 + \frac{r}{m}\right)^m \leq \left(1 + \frac{r}{k}\right)^k$$

(10)