$P(D_i^{T-t} \geq X_i)$ is the probability that the demand of group type i in $(T-t)$ periods is no less than X_i.

D_j^t is a random variable indicating the number of group type j in t periods.

$$d^t(i,\hat{i}) = \underbrace{i + (\hat{i} - i - \delta)P(D_{\hat{i}-i-\delta}^{T-t} \geq X_{\hat{i}-i-\delta} + 1)}_{\text{acceptance}} - \underbrace{\hat{i}P(D_{\hat{i}}^{T-t} \geq X_{\hat{i}})}_{\text{rejection}}$$