

**Example Text:**

\[ T^* = \frac{2k}{\sum h \times \lambda (1 - \frac{1}{\phi})}; \quad T^* = \frac{2k}{\sum h \times \lambda} \]

By taking the derivative of \( T \) with respect to \( Q \), we obtain:

\[ \frac{\partial}{\partial Q} \left[ \frac{2k}{\sum h \times \lambda (1 - \frac{1}{\phi})} \right] = \frac{2k}{\sum h \times \lambda} \]

### MODELS

**Model 1 - Shortest Horizon:**

\[ Y(\lambda, Q) = k \frac{\lambda^2}{Q} + h \frac{(Q - b)^2}{2Q} + \frac{b^2}{2Q} \]

**Model 2 - Longest Horizon:**

\[ Y(\lambda, Q) = k \frac{\lambda^2}{Q} + h \frac{(Q - b)^2}{2Q} + \frac{b^2}{2Q} \]

**Model 3 - Extended Horizon:**

\[ G(\lambda, Q) = \sum_{j=1}^{n} \left( k \frac{\lambda_j}{Q_j} + h_j \frac{Q_j}{2} + c \frac{\lambda_j}{Q_j} \right) \]

*Note:* The model is presented in a mathematical format with symbols representing various parameters and variables.
The model for trend is represented by:

\[ F_{t+1} = \hat{a} + \hat{b} \cdot t \]

The trend equation is:

\[ \hat{a} = \frac{1}{n} \sum_{t=1}^{n} D_t - \hat{b} \cdot \frac{1}{n} \sum_{t=1}^{n} t \]

\[ \hat{a}_t = \frac{1}{k} \sum_{i=t-k+1}^{t} D_i \]

\[ \hat{a}_n = \alpha D_n + (1-\alpha) \hat{a}_{n-1} \]

The equation for the model is:

\[ \hat{D}_t = D_t - \hat{b}_0, \hat{D}_0 = D_0 - \hat{b}_0 \]

The equation for MAD is:

\[ \text{MAD} = \frac{1}{n} \sum_{i=1}^{n} |e_i| \]

The equation for Winters model is:

\[ F_{i+1} = \left( \frac{\hat{D}_i + \hat{b}_i \cdot t}{\hat{C}_{i-L}} \right) \hat{C}_{i+1-L} \]

\[ \hat{a} = \frac{1}{n} \sum_{t=1}^{n} D_t - \hat{b} \cdot \frac{1}{n} \sum_{t=1}^{n} t \]

\[ \hat{a}_t = \frac{1}{k} \sum_{i=t-k+1}^{t} D_i \]

\[ \hat{a}_n = \alpha D_n + (1-\alpha) \hat{a}_{n-1} \]

\[ \hat{D}_t = D_t - \hat{b}_0, \hat{D}_0 = D_0 - \hat{b}_0 \]

\[ \hat{b}_t = \frac{2\Delta_t}{k-1}, \Delta_t = M^1_t - M^2_t \]

\[ \hat{b}_0 = \frac{1}{n} \sum_{t=1}^{n} (D_t - \hat{D}_t) \]

\[ \hat{C}_t = \gamma \cdot \frac{\hat{D}_t}{\hat{D}_0} + (1-\gamma) \hat{C}_{t-L} \]

\[ \hat{C}_{i=L} = \gamma \cdot \frac{\hat{D}_1}{\hat{D}_0} + (1-\gamma) \hat{C}_{i+1-L} \]

\[ \hat{V}_1 = \frac{L}{L} \sum_{i=1}^{L} D_i \]

\[ \hat{V}_2 = \frac{L}{L} \sum_{i=1}^{L} (D_i - 1/2) \hat{b}_0 \]

\[ \hat{a}_0 = \hat{V}_1 - \hat{b}_0 \]

\[ \hat{c}_{i-L} = \frac{1}{L} \sum_{t=1}^{L} C_t \]

\[ \hat{C}_{i=L} = \frac{1}{L} \sum_{t=1}^{L} C_t \]