(a) Individual Stock Time Series

$I_{S,J,1}$ $I_{S,J,2}$ $\cdots$ $I_{S,J,T}$ Data Model

$B_{S,J,1} \rightarrow B_{S,J,2} \rightarrow \cdots \rightarrow B_{S,J,T}$ Process Model

$\{q_{S,J}, B_{S,J,0}, r_{S,J}, \sigma^2_{S,J}, \tau^2_{S,J}\} = \Theta_{S,J}$ Stock Parameters

$\{m_B, v_B, m_\sigma, v_\sigma, m_\tau, v_\tau\} = \overline{\Theta}_{S,J}$ Stock Hyperparameters
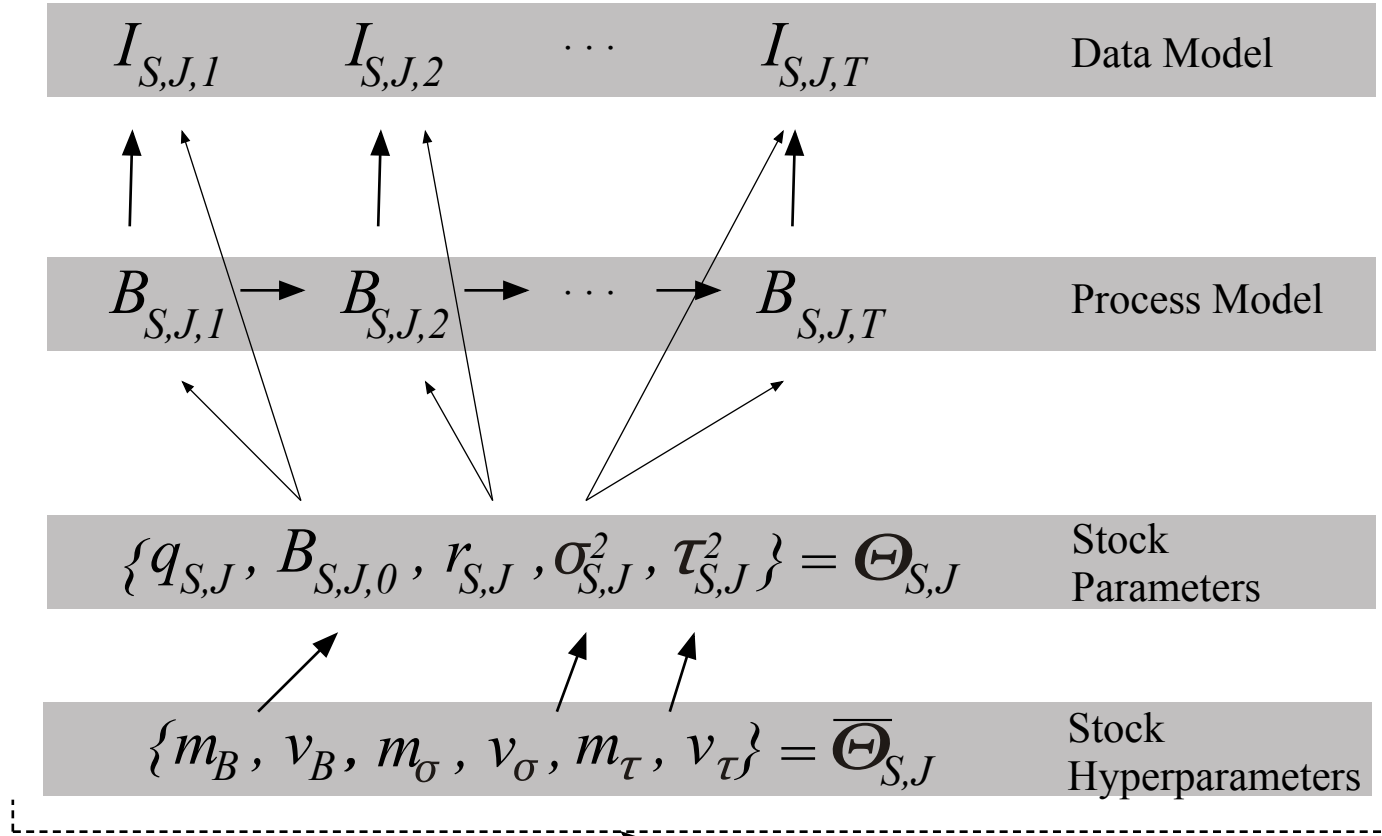
(b) Species Hierarchical Model

$\boldsymbol{I_{S,1}}$ $\boldsymbol{I_{S,2}}$ $\cdots$ $\boldsymbol{I_{S,J}}$ Data Model

$\boldsymbol{B_{S,1}}$ $\boldsymbol{B_{S,2}}$ $\cdots$ $\boldsymbol{B_{S,J}}$ Process Model

$\boldsymbol{\Theta_{S,1}}$ $\boldsymbol{\Theta_{S,2}}$ $\cdots$ $\boldsymbol{\Theta_{S,J}}$ Stock Parameters

α^2 Species Parameters

m_q, v_q m_α, v_α m_r, v_r Species Hyperparameters
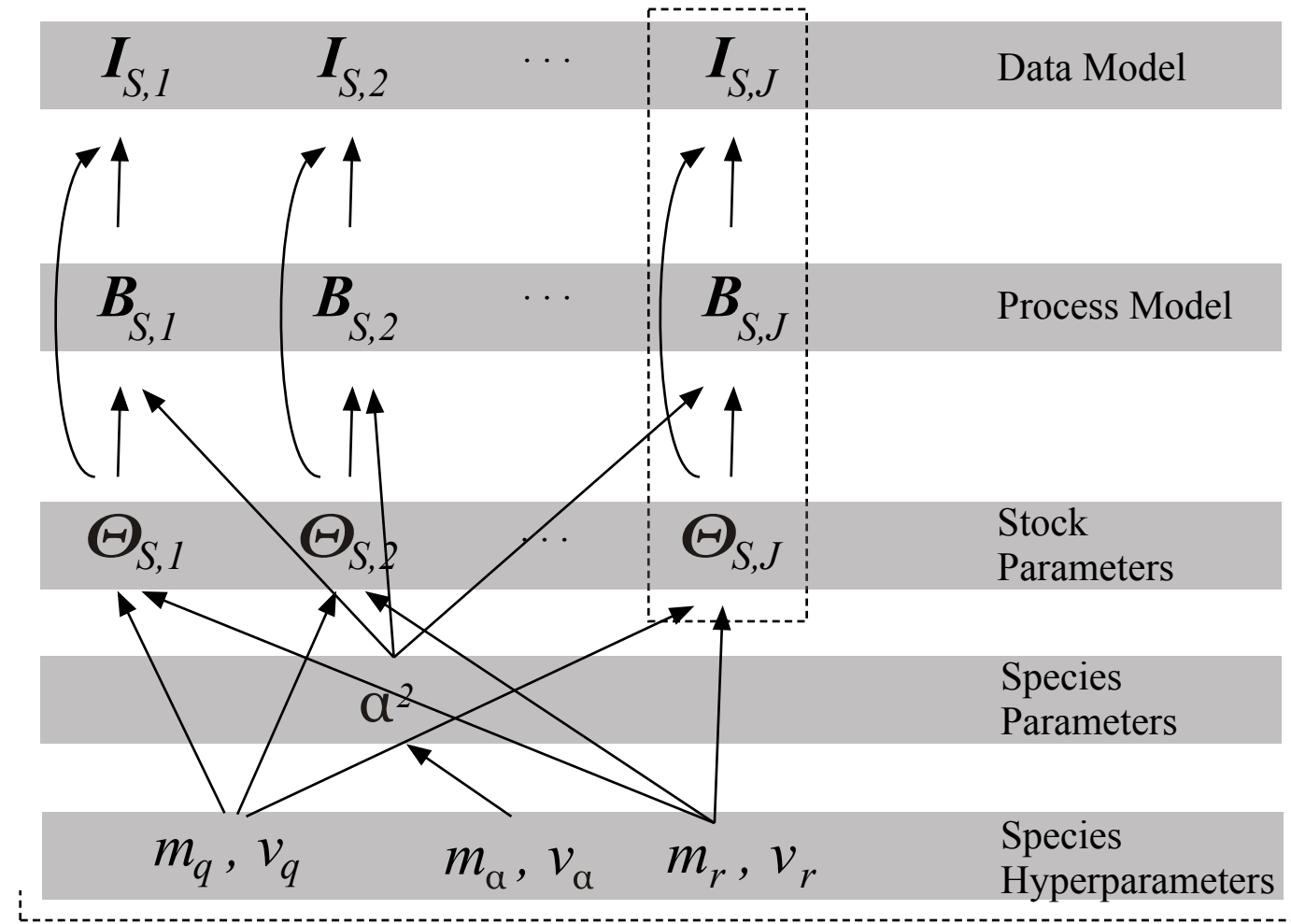
(c) Assemblage Hierarchical Model

$\boldsymbol{I_1}$ $\boldsymbol{I_2}$ $\cdots$ $\boldsymbol{I_S}$ Data Model

$\boldsymbol{B_1}$ $\boldsymbol{B_2}$ $\cdots$ $\boldsymbol{B_S}$ Process Model

$\boldsymbol{\Theta_1}$ $\boldsymbol{\Theta_2}$ $\cdots$ $\boldsymbol{\Theta_S}$ Stock Parameters

β^2 Assemblage Parameters

m_q, v_q m_β, v_β Assemblage Hyperparameters