

$$R_{i,j}^+ := \mathbb{E} \left[b c_j + b^{-1} (e^b - 1) u_i w_j \right];$$

$$R_{i,j}^- := \mathbb{E} \left[-b c_j + b^{-1} (e^{-b} - 1) u_i w_j \right];$$