

$$\begin{array}{ccc}
 * & \xrightarrow{\quad \otimes \quad} & \text{Bilin}_k(V, W; V \otimes_k W) \\
 & \searrow \phi & \downarrow \tilde{\phi}_* \\
 & & \text{Bilin}_k(V, W; U)
 \end{array}$$

$$\begin{array}{ccc}
 & & V \otimes_k W \\
 & & \downarrow \tilde{\phi} \\
 & & U
 \end{array}$$