

$$\begin{array}{ccc}
 \mathbf{u} & \xrightarrow{T} & T(\mathbf{u}) \\
 \rho_B \downarrow & & \downarrow \rho_C \\
 \rho_B(\mathbf{u}) & \xrightarrow{M_{B,C}^T} & M_{B,C}^T \rho_B(\mathbf{u}) = \rho_C(T(\mathbf{u}))
 \end{array}$$