$$
\begin{array}{ccc}
V & \xrightarrow{\ \phi_{T,\mathcal{E}}\ } & V =\!=\!=\!=\!=\!= V \\
\Big\uparrow{\scriptstyle\phi_{M,\mathcal{E}_0}} & & \Big\uparrow{\scriptstyle\phi_{M,\mathcal{E}_0}} \\
V & & V \\
\Big\uparrow{\scriptstyle\ell_{\mathcal{E}_0}} & & \Big\uparrow{\scriptstyle\ell_{\mathcal{E}_0}} \qquad \Big\uparrow{\scriptstyle\ell_{\mathcal{E}_0}} \\
K^{n+1} & \xrightarrow[\ a\mapsto Ta\ ]{} & K^{n+1} \xrightarrow[\ a\mapsto Ma\ ]{} K^{n+1}
\end{array}
$$