$$
\begin{tikzcd}
 & \begin{pmatrix} A_1 \\ \downarrow \\ A_2 \end{pmatrix} \arrow[dl] \arrow[d] \arrow[dr] & \\
\begin{pmatrix} B_1 \\ \downarrow \\ B_2 \end{pmatrix} & \begin{pmatrix} B_1 \times C_1 \\ \downarrow \\ B_2 \times C_2 \end{pmatrix} \arrow[l] \arrow[r] & \begin{pmatrix} C_1 \\ \downarrow \\ C_2 \end{pmatrix}
\end{tikzcd}
$$

$$
\begin{tikzcd}
B_1 \arrow[r, "f_1"] \arrow[d, "\beta"'] & C_1 \arrow[d, "\gamma"'] \\
B_2 \arrow[r, "f_2"] & C_2
\end{tikzcd}
\qquad
\begin{tikzcd}
\begin{pmatrix} A_1 \times B_1 \\ \downarrow \\ A_2 \times B_2 \end{pmatrix} \arrow[d] & \begin{pmatrix} A_1 \\ \downarrow \\ A_2 \end{pmatrix} \arrow[l, mapsto] \arrow[d] \\
\begin{pmatrix} C_1 \\ \downarrow \\ C_2 \end{pmatrix} \arrow[r, mapsto] & \begin{pmatrix} \{\, (f_1, f_2) \mid f_1 : B_1 \to C_1, f_2 : B_2 \to C_2, \gamma \circ f_1 = f_2 \circ \beta \,\} \\ \downarrow \\ \{\, f_2 \mid f_2 : B_2 \to C_2 \,\} \end{pmatrix}
\end{tikzcd}
$$