

$$Y \xrightarrow{g} Y'$$

$$\begin{array}{ccc} X & \mathbb{E}(X, Y) & \xrightarrow{g_*} \mathbb{E}(X, Y') \\ f \uparrow & \downarrow f^* & \downarrow f^* \\ X' & \mathbb{E}(X', Y) & \xrightarrow{g_*} \mathbb{E}(X', Y') \end{array}$$