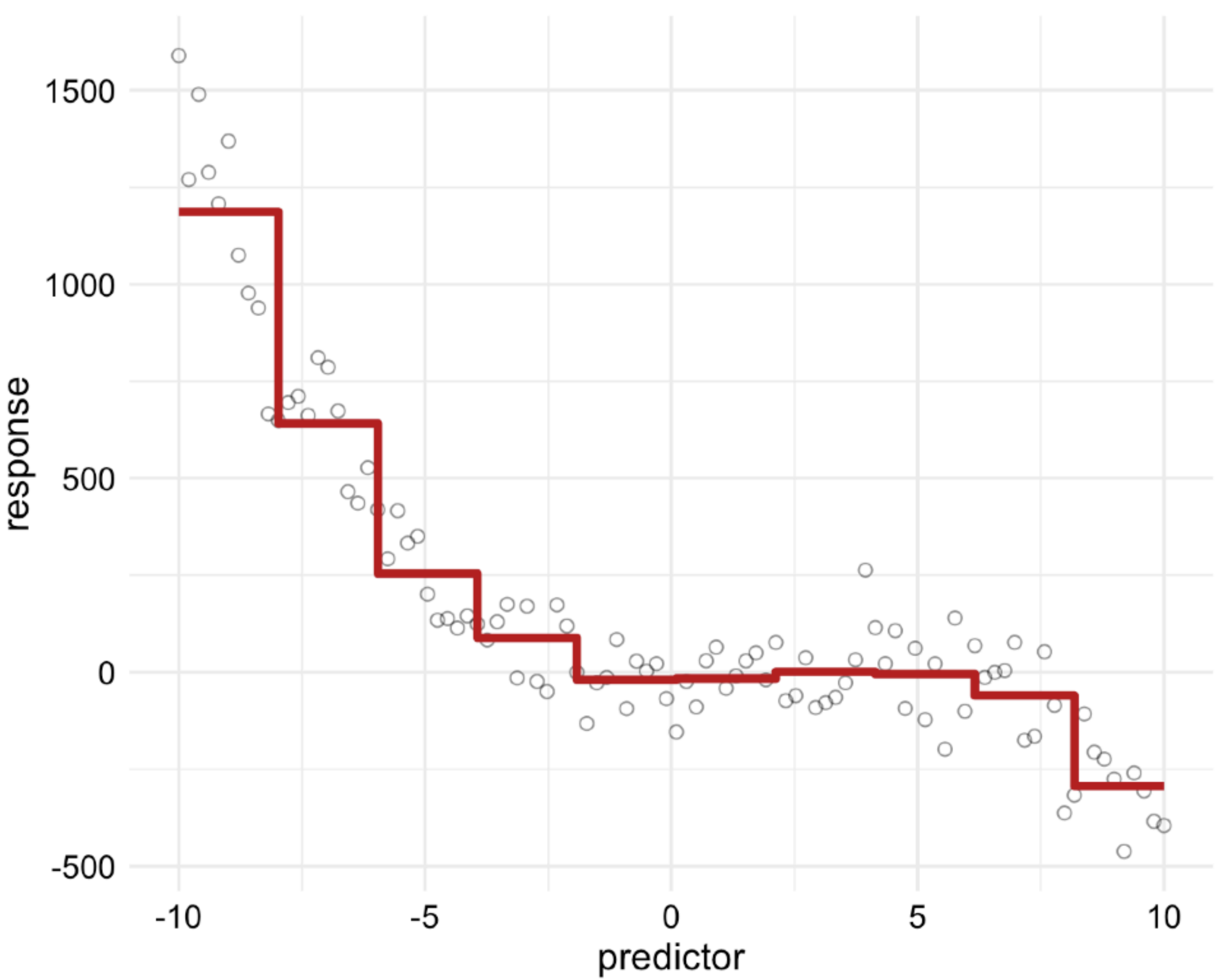
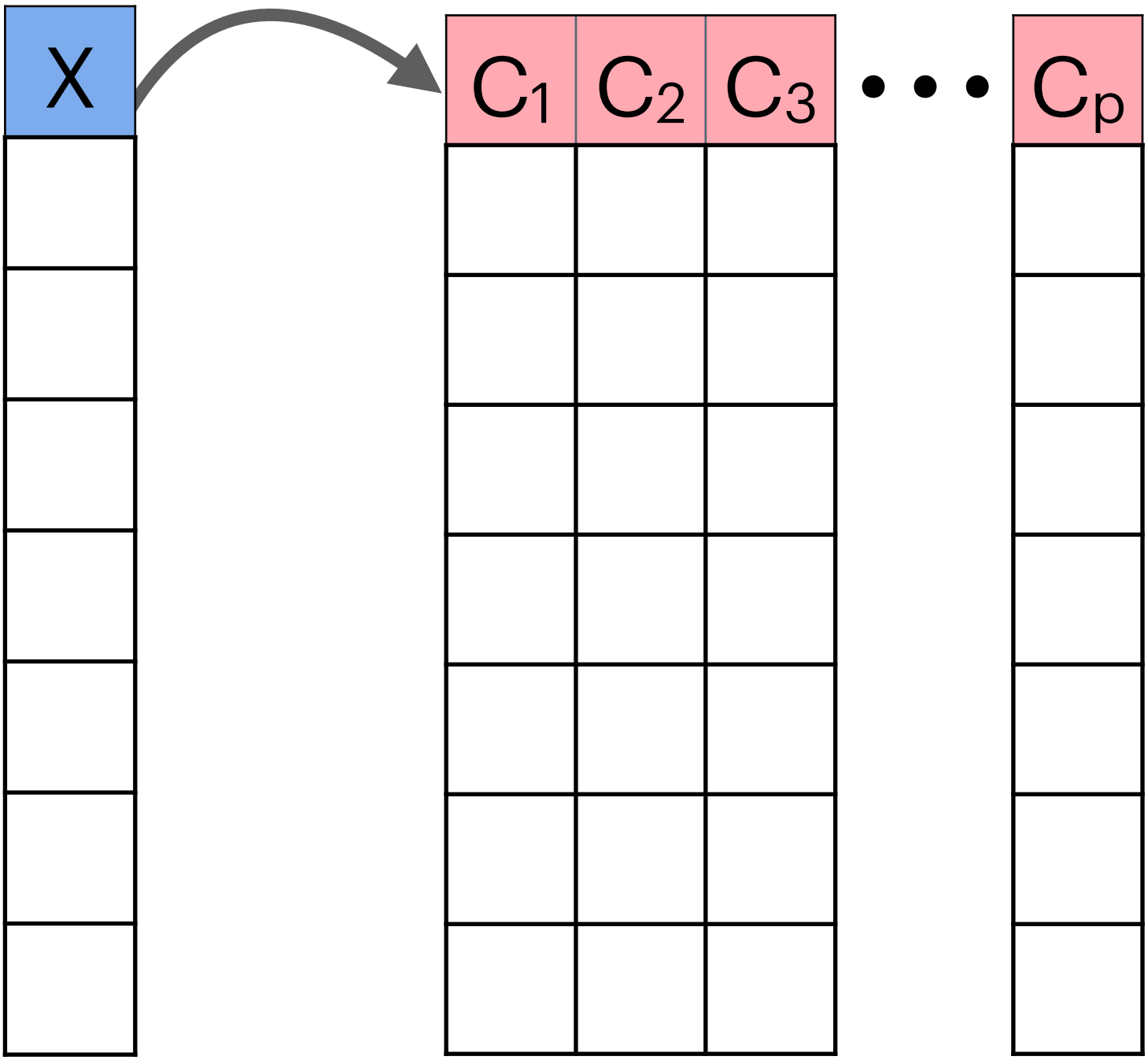
Step Functions

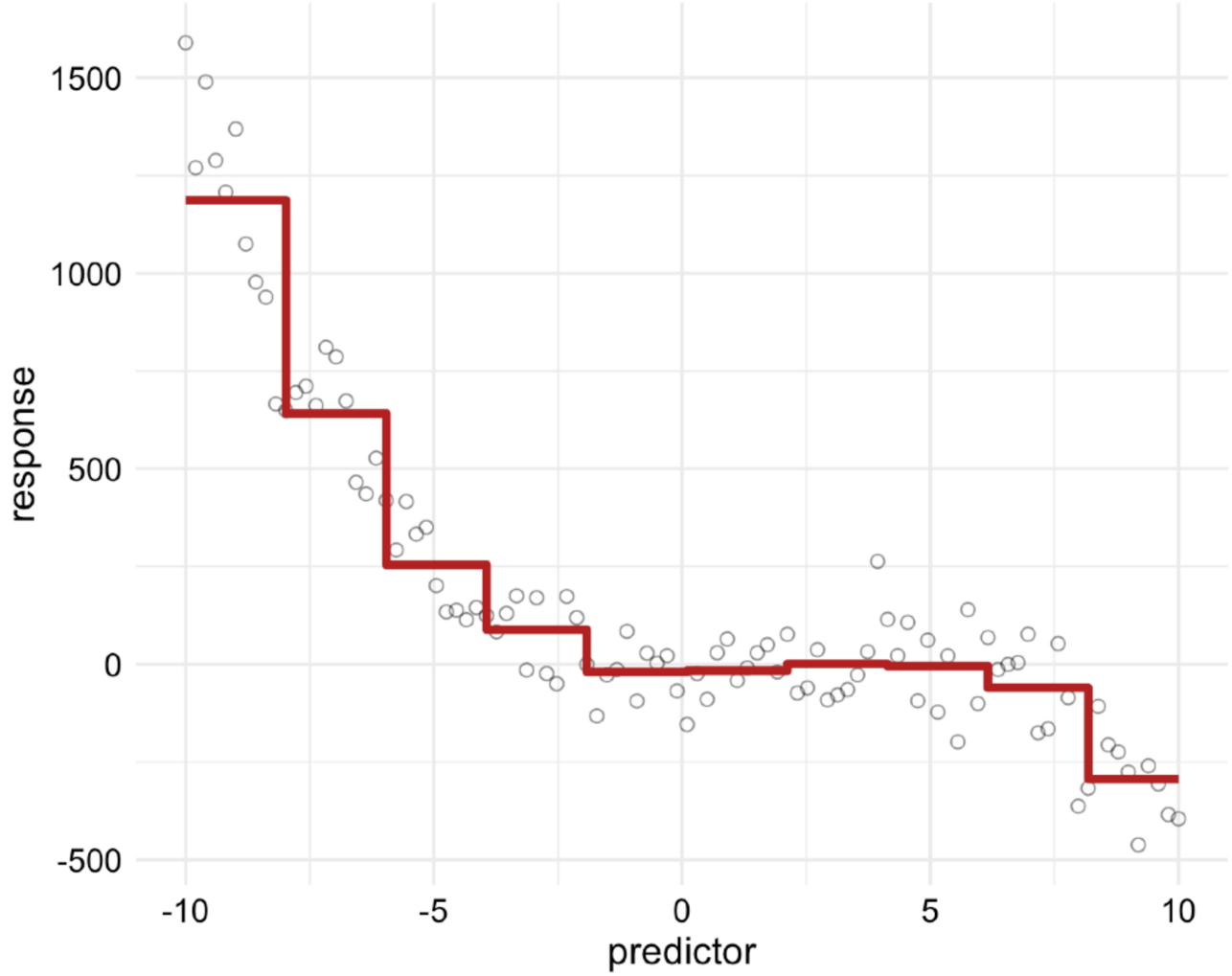

1500
1000
500
0
-500
response
-10
-5
0
5
10
predictor

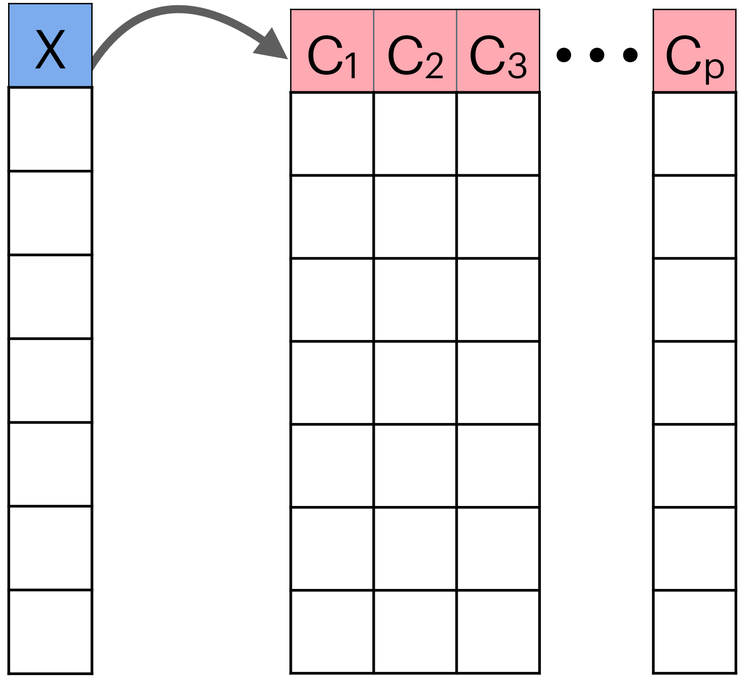
$$Y = \beta_0 + \beta_1 C_1(X) + \beta_2 C_2(X) + \cdots + \beta_K C_K(X) + \epsilon$$


X
C1
C2
C3
Cp

Step Functions

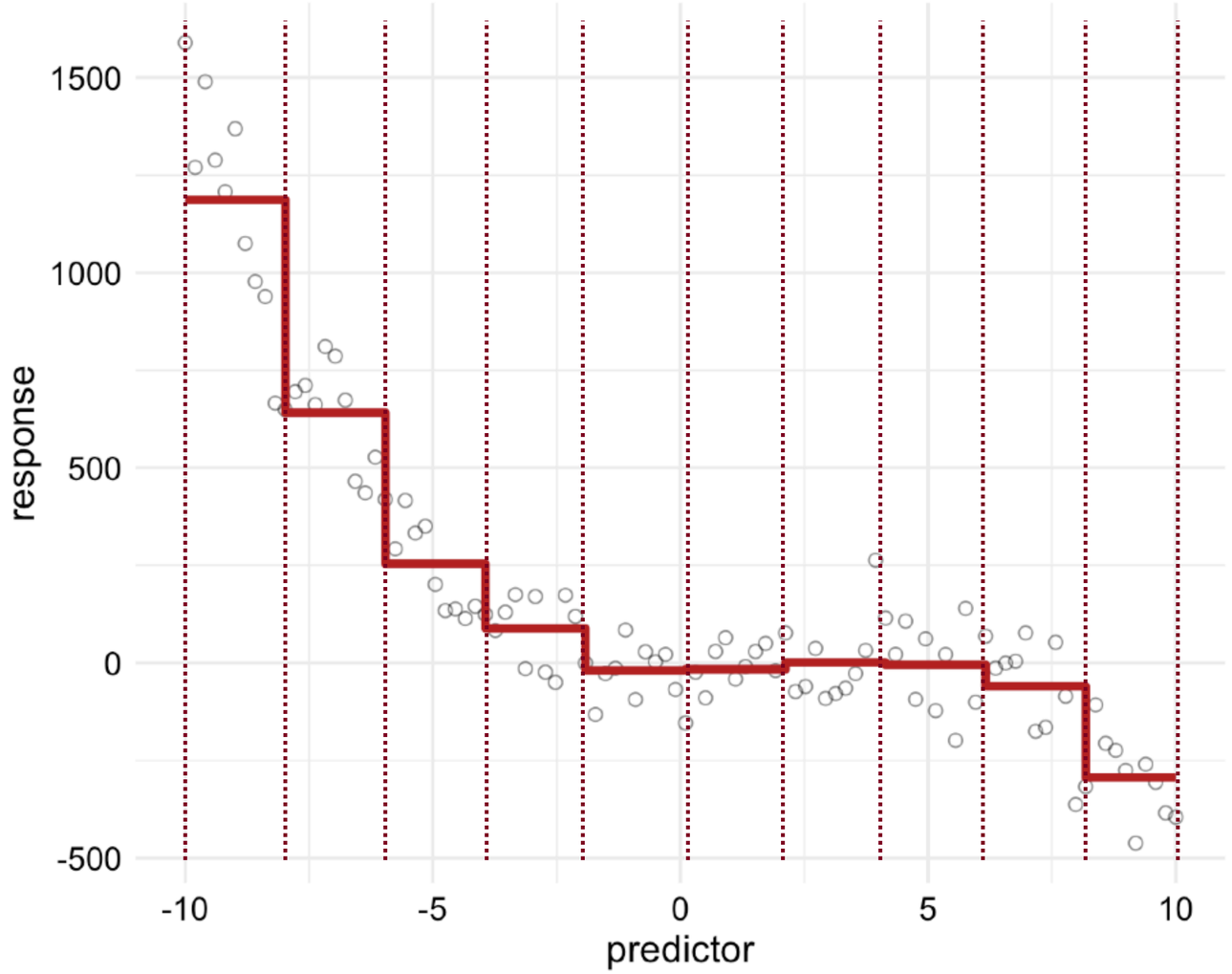
$$Y = \beta_0 + \beta_1 C_1(X) + \beta_2 C_2(X) + \cdots + \beta_K C_K(X) + \epsilon$$





Step Functions

$$Y = \beta_0 + \beta_1 C_1(X) + \beta_2 C_2(X) + \cdots + \beta_K C_K(X) + \epsilon$$



$$\begin{aligned} C_0(X) &= I(X \leq c_1) \\ C_1(X) &= I(c_1 < X < c_2) \\ &\vdots \\ C_{K-1}(X) &= I(c_{K-1} < X < c_K) \\ C_K(X) &= I(c_K < X) \end{aligned}$$

where $I(\cdot)$ is an indicator function