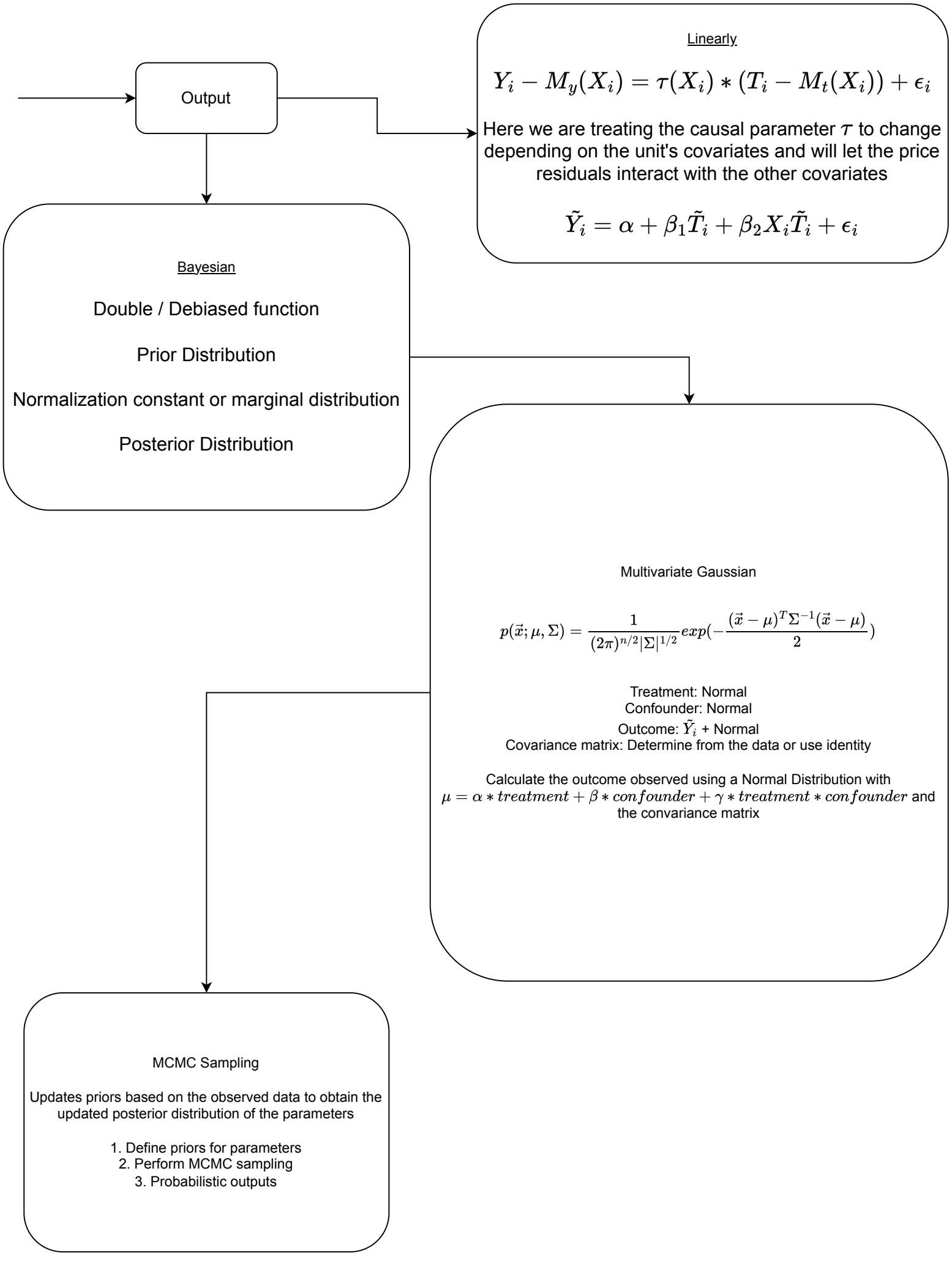
Output
Linearly
$Y_i - M_y(X_i) = \tau(X_i) * (T_i - M_t(X_i)) + \epsilon_i$
Here we are treating the causal parameter τ to change depending on the unit's covariates and will let the price residuals interact with the other covariates
$\tilde{Y}_i = \alpha + \beta_1 \tilde{T}_i + \beta_2 X_i \tilde{T}_i + \epsilon_i$
Bayesian
Double / Debiased function
Prior Distribution
Normalization constant or marginal distribution
Posterior Distribution
Multivariate Gaussian
$p(\vec{x}; \mu, \Sigma) = \frac{1}{(2\pi)^{n/2}|\Sigma|^{1/2}} exp(-\frac{(\vec{x}-\mu)^T \Sigma^{-1} (\vec{x}-\mu)}{2})$
Treatment: Normal
Confounder: Normal
Outcome: $\tilde{Y}_i$ + Normal
Covariance matrix: Determine from the data or use identity
Calculate the outcome observed using a Normal Distribution with $\mu = \alpha * treatment + \beta * confounder + \gamma * treatment * confounder$ and the convariance matrix
MCMC Sampling
Updates priors based on the observed data to obtain the updated posterior distribution of the parameters
1. Define priors for parameters
2. Perform MCMC sampling
3. Probabilistic outputs