

$$x^j \sim X_t$$

$$x_{t+1}^{j,u} = \mu(t, x^j, u) \Delta t + \sigma(t, x^j, u) \Delta B_t$$

$$\{(x^j, y^j = V(t+1, x_{t+1}^{j,u}))\}_{j \in [J]}$$

$$\mathbb{E}[Y|X]$$

$$\mathbb{E}[V(t+1, X_{t+1}^u) | X_t = x]$$

$$\min_{u(x)} C(t, x, u) + \mathbb{E}[V(t+1, X_{t+1}^u) | X_t = x]$$

$$u^*(x)$$

$$V(t, x) := C(t, x, u^*(x)) + \mathbb{E}[V(t+1, X_{t+1}^{u^*}) | X_t = x]$$