

2. Concept of state

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DS with auxiliary variables x

$$S_x = \{T, W, X, \Sigma_x\}$$

Σ_x satisfies the

State equation

$$\{(w_0^1, x_0^1), (w_0^2, x_0^2) \in \Sigma_x(t_0), t \geq t_0 \text{ and } x_0^1(t) = x_0^2(t)\} \Rightarrow$$

$$\Rightarrow \{(w_0, x_0) \in \Sigma_x(t_0)\}$$

where, given $t' \in T$

$$\{w_0(t'), x_0(t')\} = \begin{cases} (w_0^1(t'), x_0^1(t')) & t' < t \\ (w_0^2(t'), x_0^2(t')) & t' \geq t \end{cases}$$

At time t $x_0^1 = x_0^2$, the future behavior is independent by the past and it can follow (w_0^1, x_0^1) or (w_0^2, x_0^2) .