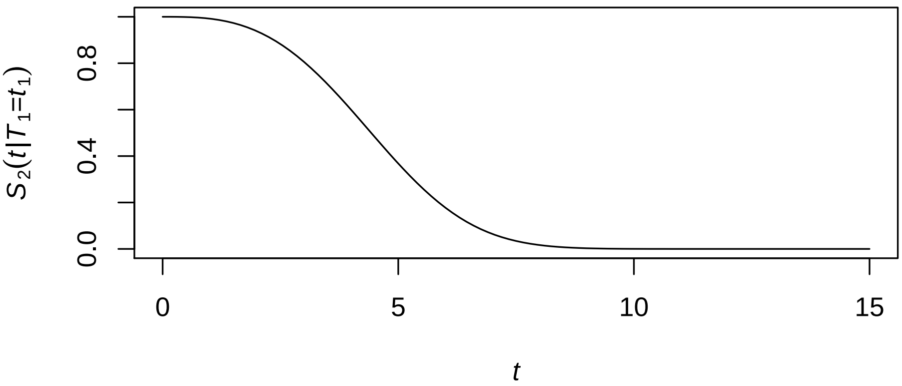
Consider a subject arriving at state s at time t_1. To simulate the time of the next transition, a marginal survival function $S_2(t) = \exp(-\int_0^t h_2(u)\mathrm{d}u)$ is chosen and, according to the copula model, a conditional survival function $S_2(t|T_1 = t_1)$ is obtained.



As time until t_1 has already passed, the simulation of the additional time from $S_2(t)$ corresponds to the clock-reset approach in modelling. In this case, since $S_2(t|T_1 = t_1) \sim \mathrm{U}(0,1)$, then simulation is done by

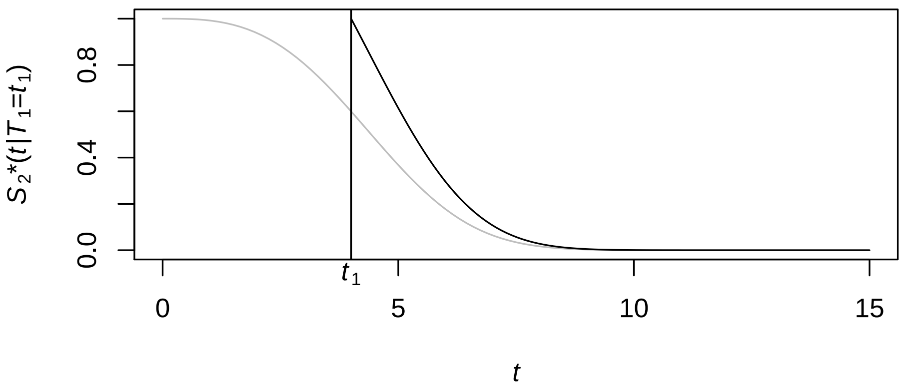
$$T_2 = S_2^{-1}(U|T_1 = t_1), \qquad U \sim \mathrm{U}(0,1), \tag{1}$$

where $S^{-1}(\cdot)$ is the inverse of $S(\cdot)$.

If, on the contrary, one wants to simulate data in a clock-forward manner, the truncated distribution

$$\begin{aligned} S_2^\star(t|T_1 = t_1) &= \mathbb{P}(T > t|T_1 = t_1, T > t_1) \\ &= \frac{\mathbb{P}(T > t, T_1 = t_1|T > t_1)}{\mathbb{P}(T_1 = t_1|T > t_1)} = \frac{S_2(t|T_1 = t_1)}{S_2(t_1|T_1 = t_1)} \end{aligned}$$

must be used.



Now simulation is done by

$$T_2 = S_2^{\star -1}(U|T_1 = t_1) = S_2^{-1}(US_2(t_1|T_1 = t_1)|T_1 = t_1), \qquad U \sim \mathrm{U}(0,1)$$

which is the same as (1) with the argument U replaced by $US_2(t_1|T_1 = t_1)$.