

Supplementary Appendix SA1

(a) *Other cases that the parameters of equation have zero entries but not all zeros:*

$$\begin{cases} k_1 = 0 \\ k_2 B''(t) - k_4 \eta'(t) = 0 \\ k_3 = 0 \end{cases} \quad (\text{A.1})$$

$$\begin{cases} \eta'(t)B(t) + \eta(t)B'(t) = 0 \\ k_2 B''(t) - k_4 \eta'(t) = 0 \\ k_3 = 0 \end{cases} \quad (\text{A.2})$$

$$\begin{cases} k_1 [\eta'(t)B(t) + \eta(t)B'(t)] + k_2 B''(t) = 0 \\ k_3 = 0 \\ k_4 = 0 \end{cases} \quad (\text{A.3})$$

$$\begin{cases} k_1 [\eta'(t)B(t) + \eta(t)B'(t)] - k_4 \eta'(t) = 0 \\ k_2 = 0 \\ k_3 = 0 \end{cases} \quad (\text{A.4})$$

$$\begin{cases} \eta'(t)B(t) + \eta(t)B'(t) = 0 \\ k_2 B''(t) - k_3 [B''(t)B(t) - B'(t)^2] / B(t)^2 = 0 \\ k_4 = 0 \end{cases} \quad (\text{A.5})$$

$$\begin{cases} k_1 = 0 \\ k_2 = 0 \\ k_3 [B''(t)B(t) - B'(t)^2] / B(t)^2 + k_4 \eta'(t) = 0 \end{cases} \quad (\text{A.6})$$

$$\begin{cases} \eta'(t)B(t) + \eta(t)B'(t) = 0 \\ k_2 = 0 \\ k_3 [B''(t)B(t) - B'(t)^2] / B(t)^2 + k_4 \eta'(t) = 0 \end{cases} \quad (\text{A.7})$$

$$\begin{cases} k_1 [\eta'(t)B(t) + \eta(t)B'(t)] + k_2 B''(t) - k_4 \eta'(t) = 0 \\ k_3 = 0 \end{cases} \quad (\text{A.8})$$

$$\begin{cases} k_1 = 0 \\ k_2 B''(t) - k_3 [B''(t)B(t) - B'(t)^2] / B(t)^2 - k_4 \eta'(t) = 0 \end{cases} \quad (\text{A.9})$$

$$\begin{cases} \eta'(t)B(t) + \eta(t)B'(t) = 0 \\ k_2 B''(t) - k_3 [B''(t)B(t) - B'(t)^2] / B(t)^2 - k_4 \eta'(t) = 0 \end{cases} \quad (\text{A.10})$$

$$\begin{cases} k_1[\eta'(t)B(t) + \eta(t)B'(t)] - k_3[B''(t)B(t) - B'(t)^2] / B(t)^2 = 0 \\ k_2 = 0 \\ k_4 = 0 \end{cases} \quad (\text{A.11})$$

$$\begin{cases} k_1[\eta'(t)B(t) + \eta(t)B'(t)] + k_2B''(t) + k_3[B''(t)B(t) - B'(t)^2] / B(t)^2 = 0 \\ k_4 = 0 \end{cases} \quad (\text{A.12})$$

$$\begin{cases} k_1[\eta'(t)B(t) + \eta(t)B'(t)] + k_3[B''(t)B(t) - B'(t)^2] / B(t)^2 - k_4\eta'(t) = 0 \\ k_2 = 0 \end{cases} \quad (\text{A.13})$$

(b) *The case that none of the parameters is zero:*

$$k_1[\eta'(t)B(t) + \eta(t)B'(t)] + k_2B''(t) = k_3[B''(t)B(t) - B'(t)^2] / B(t)^2 + k_4\eta'(t) \quad (\text{A.14})$$