Model 1

$$\begin{aligned}\frac{\mathrm{d}M}{\mathrm{d}t} &= f(P) - M\\ \frac{\mathrm{d}E}{\mathrm{d}t} &= M - E\\ \frac{\mathrm{d}P}{\mathrm{d}t} &= E - d \cdot P\end{aligned}$$

Here, f is an unknown function and d is an unknown parameter.

Model 2

$$\begin{aligned}\frac{\mathrm{d}X}{\mathrm{d}t} &= f(Y) - d \cdot X\\ \frac{\mathrm{d}Y}{\mathrm{d}t} &= X - d \cdot Y\end{aligned}$$

Here, f is an unknown function and d is an unknown parameter.

Model 3

$$\begin{aligned}\frac{\mathrm{d}S}{\mathrm{d}t} &= -\beta(I) \cdot S\\ \frac{\mathrm{d}I}{\mathrm{d}t} &= \beta(I) \cdot S - \gamma I,\\ \frac{\mathrm{d}R}{\mathrm{d}t} &= \gamma I.\end{aligned}$$

Here, β is an unknown function and γ is an unknown parameter.

Model 4

$$\begin{aligned}\frac{\mathrm{d}X}{\mathrm{d}t} &= f(Y) + aX(1 - X)\\ \frac{\mathrm{d}Y}{\mathrm{d}t} &= (bX - 1)Y\end{aligned}$$

Here, f is an unknown function and a and b are unknown parameters.

Model 5

$$\begin{aligned}\frac{\mathrm{d}X}{\mathrm{d}t} &= 1 - dX,\\ \frac{\mathrm{d}Y}{\mathrm{d}t} &= f_1(X) - f_2(X)Y - dY,\\ \frac{\mathrm{d}Z}{\mathrm{d}t} &= f_2(X)Y - d \cdot Z.\end{aligned}$$

Here, f_1 and f_2 are unknown functions and d is an unknown parameter.