$$p(s|\theta) = \frac{1}{Z(\lambda, \mu_1, \mu_2)} \exp\left(\mu_1 s_1 + \mu_2 s_2 + \lambda s_1 s_2\right)$$

$$Z = 1 + e^{\mu_1} + e^{\mu_2} + e^{\mu_1 + \mu_2 + \lambda} \qquad \theta = (\mu_1, \mu_2, \lambda)$$

$$m_1 = E(s_1|\theta) = \frac{e^{\mu_1} + e^{\mu_1 + \mu_2 + \lambda}}{Z}$$

$$m_2 = E(s_2|\theta) = \frac{e^{\mu_2} + e^{\mu_1 + \mu_2 + \lambda}}{Z}$$

$$c = E(s_1 s_2|\theta) = \frac{e^{\mu_1 + \mu_2 + \lambda}}{Z}$$

$$\boxed{\begin{aligned} &0 \leq m_1, m_2, c \leq 1 \\ &c \leq m_1, m_2 \\ &c \geq 1 - m_1 - m_2 \end{aligned}}$$

$$\boxed{\begin{aligned} &\mu_1 = \ln \frac{m_1 - c}{1 + c - m_1 - m_2} \qquad \mu_2 = \ln \frac{m_2 - c}{1 + c - m_1 - m_2} \\ &\lambda = \ln \frac{c\,(1 + c - m_1 - m_2)}{(m_1 - c)\,(m_2 - c)} \end{aligned}}$$

$$p(s_1, s_2 | t) = \qquad t = (m_1, m_2, c)$$

$$(1 + c - m_1 - m_2) \left(\frac{m_1 - c}{1 + c - m_1 - m_2}\right)^{s_1} \left(\frac{m_2 - c}{1 + c - m_1 - m_2}\right)^{s_2} \left[\frac{c\,(1 + c - m_1 - m_2)}{(m_1 - c)\,(m_2 - c)}\right]^{s_1 s_2}$$

$$\det\left|\frac{\partial(\mu_1,\mu_2,\lambda)}{\partial(m_1,m_2,c)}\right| = \frac{1-c}{(m_1-c)(m_2-c)(1+c-m_1-m_2)}$$

$$\det\left|\frac{\partial(m_1,m_2,c)}{\partial(\mu_1,\mu_2,\lambda)}\right| = \frac{e^{2(\mu_1+\mu_2)+\lambda}}{\underbrace{(1+e^{\mu_1}+e^{\mu_2}+e^{\mu_1+\mu_2+\lambda})^4}_{Z^4}} = p(00)\,p(10)\,p(01)\,p(11)$$

$$\frac{1}{Z} \quad \frac{e^{\mu_1}}{Z} \quad \frac{e^{\mu_2}}{Z} \quad \frac{e^{\mu_1+\mu_2+\lambda}}{Z}$$

← only way in which it can be decomposed

Therefore, $p(t|I)\,dt = p(t|I)\left|\frac{\partial t}{\partial \theta}\right| d\theta = p(\theta|I)\,d\theta$

$$p(t|I)\;p(00|\theta)\,p(10|\theta)\,p(01|\theta)\,p(11|\theta)\,d\theta$$

$$\Rightarrow \boxed{p(t|I) = \text{const} \;\hat{=}\; p(\theta|I) = \text{const.} \times p(00|\theta)\,p(10|\theta)\,p(01|\theta)\,p(11|\theta)}$$