

1 Parametric-Cure Model (PCM) forms

These are two split-population models. Survival, $S(t)$ where $g(t)$ is time, t , itself or \tilde{t} . Please note that \tilde{t} is the scaled and shaped time: $\tilde{t} = (\lambda t)^\gamma$ where the scale and shape are, respectively, $\lambda = \exp(x_\lambda \beta_\lambda)$ and $\gamma = \exp(x_\gamma \beta_\gamma)$.

1.1 mixture, model or class (00) the Stata evaluator: PCM00kkll.ado.

$$S(t) = \pi + (1 - \pi)(1 - F(g(t))) \quad (1)$$

1.2 non-mixture, model (01) the Stata evaluator: PCM01kkll.ado.

$$S(t) = \pi^{F(g(t))} \quad (2)$$

1.3 fail density: the Stata evaluator: PCMmmkkll.ado.

dist() or kernel distribution (*kk*):

weibull (01)

$$F(\tilde{t}) = 1 - \exp(-\tilde{t}) \quad (3)$$

lognormal (02)

$$F(\tilde{t}) = \int_{-\infty}^{\ln(\tilde{t})} \frac{1}{\sqrt{2\pi}} e^{(-x^2/2)} dx \quad (4)$$

logistic (03)

$$F(\tilde{t}) = \frac{\tilde{t}}{1 + \tilde{t}} \quad (5)$$

gamma (04)

$$F(t) = \int_0^t \frac{x^{\gamma-1}}{\lambda^\gamma \Gamma(\gamma)} \exp\left(-\frac{x}{\lambda}\right) dx \quad (6)$$

exponential (05)

$$F(t) = 1 - \exp\left(-\frac{t}{\lambda}\right) \quad (7)$$

1.4 cure-fraction link function: the Stata evaluator: PCMmmkkll.ado.

link() or cure fraction link (*ll*):

logistic (01)

$$\pi = \frac{\exp(x_\pi \beta_\pi)}{1 + \exp(x_\pi \beta_\pi)} \quad (8)$$

log-minus-log (02)

$$\pi = \exp(-\exp(x_\pi \beta_\pi)) \quad (9)$$

linear (03)

$$\pi = x_\pi \beta_\pi \quad (10)$$