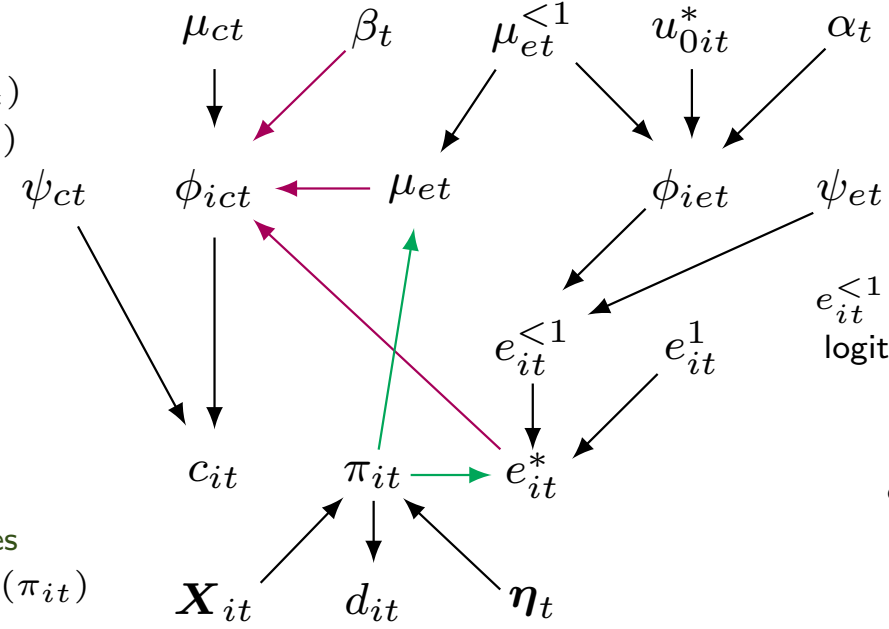
Conditional model for $c \mid e^*$

$$c_{it} \mid e^*_{it} \sim \text{Gamma}(\psi_{ct}\phi_{cit}, \psi_{ct})$$
$$\log(\phi_{cit}) = \mu_{ct} + \beta_t(e^*_{it} - \mu_{et})$$



Mixture model for e

$$e_{it}^1 := 1$$
$$e_{it}^{<1} \sim \text{Beta}\left(\phi_{eit}\psi_{et}, (1-\phi_{eit})\psi_{et}\right)$$
$$\begin{aligned}\text{logit}(\phi_{eit}) &= \mu_{et}^{<1} + \alpha_t(u_{0it} - \bar{u}_{0t}) \\ &= \mu_{et}^{<1} + \alpha_t u_{0it}^*\end{aligned}$$

$$e_{it}^* = \pi_{it}e_{it}^1 + (1-\pi_{it})e_{it}^{<1}$$

$$\mu_{et} = (1-\bar{\pi}_t)\mu_{et}^{<1} + \bar{\pi}_t$$

Model for the structural ones

$$d_{it} := \mathbf{I}(e_{it} = 1) \sim \text{Bernoulli}(\pi_{it})$$
$$\text{logit}(\pi_{it}) = \boldsymbol{X}_{it}\boldsymbol{\eta}_t$$