Migration thresholds

$$\Pr(V_T < \tilde{d}_1) = p_{\cancel{k}j1}$$

$$p_{j1} = \mathcal{N}\left(\frac{\ln(\tilde{d}_1/V_0) - (\mu_V - \frac{1}{2}\sigma_V^2)T}{\sigma\sqrt{T}}\right)$$

$$N^{-1}(p_{j1})\,\cancel{e}\sigma\sqrt{T} = \ln(\tilde{d}_1/V_0) - (\cancel{e}\mu_V - \tfrac{1}{2}\sigma_V^2)T$$

$$N^{-1}(p_{j1})\sigma\sqrt{T} + (\mu_T - \tfrac{1}{2}\sigma_V^2)T = \ln(\tilde{d}_1/V_0)$$

$$V_0\exp\left[N^{-1}(p_{j1})\sigma\sqrt{T} + (\mu_T - \tfrac{1}{2}\sigma_V^2)T\right] = \tilde{d}_1$$. Note This only works if $\tilde{d}_1 = B$ and

$$p_{j1} = \cancel{B}\,\mathcal{N}\left(\frac{\ln(B/V_0) - (\mu_V - \frac{1}{2}\sigma_V^2)T}{\sigma_V\sqrt{T}}\right)$$

Now

$$p_{j1} + p_{j2} = \mathcal{N}\left(\frac{\ln(\tilde{d}_2/V_0) - (\mu_V - \frac{1}{2}\sigma_V^2)T}{\sigma\sqrt{T}}\right)$$

$$V_0\exp\left[N^{-1}(p_{j1} + p_{j2})\sigma\sqrt{T} + (\mu_T - \tfrac{1}{2}\sigma_V^2)T\right] = \tilde{d}_2$$

$$V_0\exp\left[N^{-1}(p_{j1} + \cdots + p_{jk})\sigma\sqrt{T} + (\mu - \tfrac{1}{2}\sigma_V^2)T\right] = \tilde{d}_k$$

Then

$$d_k = \frac{\ln \tilde{d}_k - \ln V_0 - (\mu_V - \frac{1}{2}\sigma_V^2)T}{\sigma\sqrt{T}}$$

$$= N^{-1}(p_{j1} + \cdots + p_{jk})$$