Adjusting $r$ for skewness: Why?

Exponential model ($p_1$, $p_2$)

Data $\hat{p} = \hat{p}^*$

MLE $\hat{s} = \hat{s}^*$

SP version $g(s, \phi)$

Center: $\hat{s} = s - s^*$

Case: $p = 1$

$E(S; s^*) = \log g(s^*, \hat{\phi} + S)$

Calculate $a_1 = -\log 1.0$

$a_2 = -\log 8.810$

$a_3 = -\log 8.8810$

Skewness $\hat{\gamma} = \frac{a_3}{a_2^{3/2}}$

$\gamma = a_3/a_2$

See 4412 #6

$p^* = \text{2nd}$

$p^* = \text{BN}(a, 1) \text{ 2nd}$

$\Phi(h) =$

$\text{Gamma}$

$\Phi(h)$

$p^*$ is a denser approx for $p^*$

4.72
Adjusting $r$ for skewness: Why?

Exponential model $(p, p)$
Data $y \sim \phi$

MLE $\hat{\phi}_0$

SP version $g(\phi, \phi)$

Center: $b \leftarrow s - \hat{\phi}_0$

Case: $p = 1$

$E(S; \hat{\phi}_0) = \log g(\hat{\phi}_0, \hat{\phi}_0 + S)$

Calculate
\[
\begin{align*}
    a_1 &= -L_8, \\
    a_2 &= -L_8, \\
    a_3 &= -L_8, \\
    b_3 &= -L_8, \\
    x_3 &= -L_8
\end{align*}
\]

Skewness $\delta = a_3/a_2^{3/2}$

$n^\delta = n + \delta/b$

See 4412 #6

2 scalar

Gamma model (at Augustin ---)

Check

Summary: 2 scalars

$p = 2$ case

Gamma example loc 'scala'
$\text{ExpTE}(\theta, p) : y^0, \delta^0, \varphi^0$

Third order (260) says that a test of $\Psi(\varphi) : \Psi_0$ (maxima) can be obtained conditionally with a curvature adjustment.

Case(a) : $\Psi$ linear in $\varphi$
Case(b) : $\Psi$ curved in $\varphi$
third order (260) says that a test of $y(\varphi) = \varphi_0$ (maximally) can be obtained conditionally with a curvature adjustment!

Case (a): $y$ linear in $\varphi$
Case (b): $y$ curved in $\varphi$

"Obj" Patch: Default Objective

Marginalization Diverges.

Could be

Bayesian linear; Marg Q-int = badly wrong

David Stone zedek; Marg Bore.

Curved parameters, watch out if B
Get derivatives and directed derivative of \( \bar{h} \) at origin \([\text{App: } \bar{h} = \bar{S}(\bar{S}) = -2(\bar{q} + \bar{S})] \)

\[ a) \quad p=1 \quad \bar{h}_{SS} \bigg|_{S=0} \chi = \frac{\bar{h}_{SSS}}{\bar{h}_{SS}} \quad \text{Derivative} \]

\[ \bar{h}_{SSS} \]

\[ \frac{\partial \bar{h}}{\partial \bar{u}_1, \bar{u}_2} = \nabla \bar{h} \]

\[ b) \quad \bar{h}(\bar{s}_1, \bar{s}_2) \quad \text{Direction } \bar{u} = (\bar{u}_1, \bar{u}_2) \]

\[ \bar{h}_S = \frac{\partial \bar{h}}{\partial t} \bar{h}(t \bar{u}_1, t \bar{u}_2) = \bar{h}_1(t \bar{u}_1, t \bar{u}_2) \bar{u}_1 + \bar{h}_2(t \bar{u}_1, t \bar{u}_2) \bar{u}_2 \]

\[ \bar{h}_{SS} = \frac{\partial^2 \bar{h}}{\partial t^2} (\text{prev}) = \bar{h}_{11} \bar{u}_1 \bar{u}_1 + 2 \bar{h}_{12} \bar{u}_1 \bar{u}_2 + \bar{h}_{22} \bar{u}_2 \bar{u}_2 \]

\[ \bar{h}_{SSS} = \frac{\partial^3 \bar{h}}{\partial t^3} (\text{prev}) = \bar{h}_{111} \bar{u}_1^3 + \bar{h}_{222} \bar{u}_2^3 + \bar{h}_{112} \bar{u}_1 \bar{u}_2^2 + \bar{h}_{122} \bar{u}_1^2 \bar{u}_2 + \bar{h}_{113} \bar{u}_1 \bar{u}_2 \bar{u}_3 + \bar{h}_{123} \bar{u}_1 \bar{u}_2 \bar{u}_3 \]

\[ \bar{h}_{SSS} = \frac{\partial^3 \bar{h}}{\partial t^3} (\text{prev}) = \bar{h}_{111} \bar{u}_1^3 + \bar{h}_{222} \bar{u}_2^3 + \bar{h}_{112} \bar{u}_1^2 \bar{u}_2 + \bar{h}_{122} \bar{u}_1 \bar{u}_2^2 + \bar{h}_{113} \bar{u}_1 \bar{u}_2 \bar{u}_3 + \bar{h}_{123} \bar{u}_1 \bar{u}_2 \bar{u}_3 \]