**Matching mode and variance**

If we are currently modelling , meaning

mode = *E*

var =

Noting that as or , .

Then the shape and scale of a gamma(a, b) has:

Mode =

Var =

Therefore matching modes gives:

So:

And matching variances gives:

So that setting the a’s equal gives:

Solving for *b* using the quadratic formula:

So our model would be:

Where:

**Matching mode and mean:**

If we are currently modelling , meaning

mode = *E*

mean =

Then the shape and scale of a gamma(a, b) has:

Mode =

Mean =

Therefore matching modes gives:

So:

And matching mean gives:

So that setting the a’s equal gives:

So our model would be:

Where:

Or using rate

Where: