The Lognormal distribution

The Lognormal distribution is a distribution concentrated on the set of positive numbers. The distribution is particularly well suited to model uncertainty of quantities being a product of many "underlying" variables. The Lognormal distribution is often used to model uncertainty about variables representing cost.

In the Lognormal distribution the key numbers, "a", "b" and "c" are interpreted as follows:

"a"
=
The 10%-fractile.

"b"
=
The 50%-fractile.

"c"
=
The 90%-fractile.

To get a sensible distribution, the specified values must satisfy:

$$0 < \text{"a"} \; < \; \text{"b"} \; < \; \text{"c"}$$

DynRisk will adjust the numbers further to make the fractiles fit the fractiles of a Lognormal distribution.

The Lognormal distribution will fit the specified fractiles perfectly, i.e., no further adjustments are needed if the fractiles satisfy the following equation:

$$\text{"b"} / \text{"a"} \; = \; \text{"c"} / \text{"b"}$$

Note that in this case, the "b" value is the geometric mean of the "c" and the "a" value.

Assume e.g., that the following key numbers are specified:

$$\text{"a"} \; = \; 0.5$$
$$\text{"b"} \; = \; 1.0$$
$$\text{"c"} \; = \; 2.0$$

In this case we get that:

$$\text{"b"} / \text{"a"} \;=\; \text{"c"} / \text{"b"} \;=\; 2.0$$

Thus, the Lognormal distribution fits the specified fractiles perfectly.