Theorem The exponential distribution is a special case of the IDB distribution when $\delta = \kappa = 0$ and $\alpha = 1/\gamma$.

Proof The IDB distribution has hazard function

$$h(x) = \delta x + \frac{\gamma}{1 + \kappa x} \qquad x \geq 0.$$

When $\delta = \kappa = 0$ and $\alpha = 1/\gamma$ this reduces to

$$h(x) = 0 + \frac{\gamma}{1 + 0} = \gamma = \frac{1}{\alpha} \qquad x \geq 0,$$

which is the hazard function of an exponential random variable.

APPL verification: The APPL statements

```
assume(d >= 0);
assume (gam >= 0);
assume(k >= 0);
assume(alpha > 0);
X := [[x -> d * x + gam / (1 + k * x)], [0, infinity], ["Continuous", "HF"]];
h := subs([d = 0, k = 0, gam = (1 / alpha)], X[1][1](x));
Y := ExponentialRV(1 / alpha);
HF(Y);
```

yield hazard functions with identical forms, so the exponential distribution is a special case of the IDB distribution.