(1) $$S[Y] = \begin{cases} Y & when\ Y \le K_{IRB} \\ K_{IRB} + K[Y] - K[K_{IRB}] + \dfrac{d \cdot K_{IRB}}{20}\left(1 - e^{\frac{20 \cdot (K_{IRB} - Y)}{K_{IRB}}}\right) & when\ Y > K_{IRB} \end{cases}$$

(2) $$K[Y] = (1-h) \cdot \left[\left(1 - \beta[Y; a, b]\right) \cdot Y + \beta[Y; a+1, b] \cdot c\right]$$

(3) $$h = \left(1 - \frac{K_{IRB}}{EWALGD}\right)^N$$

(4) $$a = g \cdot c$$

(5) $$b = g \cdot (1 - c)$$

(6) $$c = \frac{K_{IRB}}{1 - h}$$

(7) $$g = \frac{(1 - c) \cdot c}{f} - 1$$

(8) $$f = \frac{v + K_{IRB}^{\ 2}}{1 - h} - c^2 + \frac{(1 - K_{IRB}) \cdot K_{IRB} - v}{(1 - h) \cdot 1000}$$

(9) $$v = K_{IRB} \cdot \frac{(EWALGD - K_{IRB}) + .25 \cdot (1 - EWALGD)}{N}$$

(10) $$d = 1 - (1 - h) \cdot (1 - \beta[K_{IRB}; a, b])\,.$$

(11) In these expressions, β [Y; a, b] refers to the cumulative beta distribution with parameters a and b evaluated at Y. In the case where N = 1 and EWALGD = 100 percent, S[Y] in formula (1) must be calculated with K[Y] set equal to the product of K_{IRB} and Y, and d set equal to 1 - K_{IRB}.