Yitzhaki's Weights for $\mathbf{X} \sim BetaPDF(x, \alpha, \beta)$

Legend:
- $d[g(x)]/dx;\ b = 0,\ c = 0.5$
- $w(x);\ \beta = 1,\ \sigma_{X,Y}/\sigma_X^2 = 0.73774$
- $w(x);\ \beta = 2,\ \sigma_{X,Y}/\sigma_X^2 = 0.80701$
- $w(x);\ \beta = 5,\ \sigma_{X,Y}/\sigma_X^2 = 1.1052$
- $w(x);\ \beta = 10,\ \sigma_{X,Y}/\sigma_X^2 = 1.6054$

Y-axis: Yitzhaki's Weights

X-axis: $x,\ g(x) = b*x + c*\log(x),\ X \sim BetaPDF(x, \alpha, \beta);\ \alpha = 5$
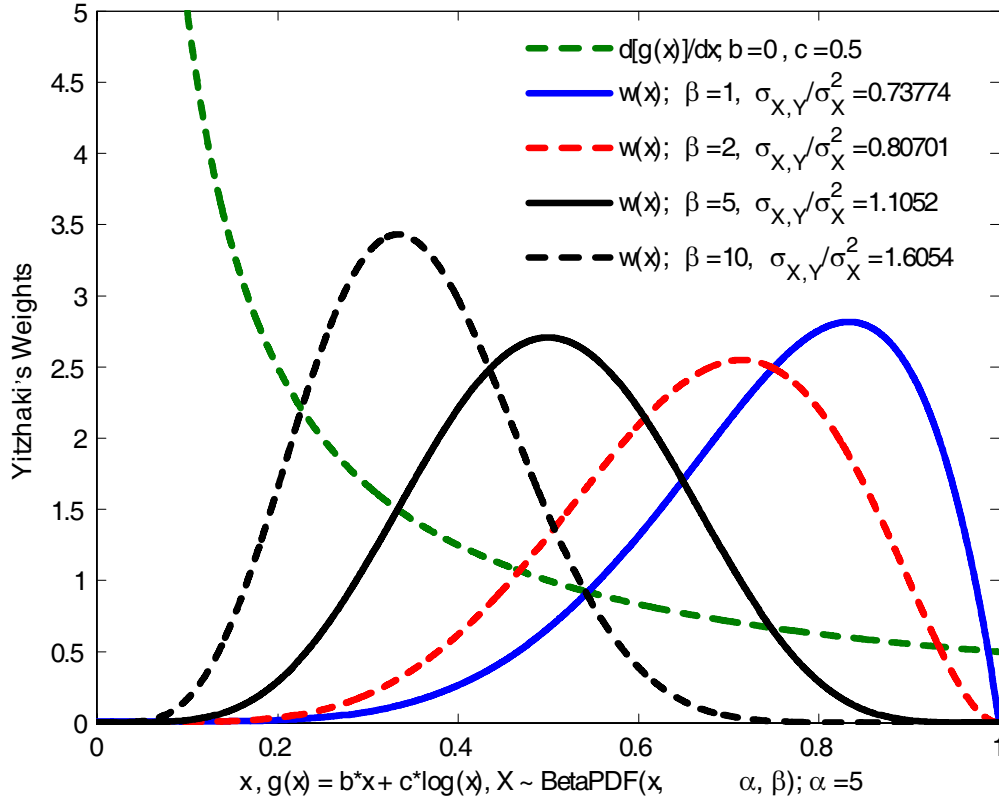
$$E\left(Y|X = x\right) = g(x) \Rightarrow \frac{Cov(X,Y)}{Var(X)} = \int_{-\infty}^{\infty} g'(t)w(t)dx$$

$$w(t) = \frac{1}{Var(X)} E\left(X|X > t\right) \cdot \Pr\left(X > t\right)$$

$$\mathbf{X} \sim BetaPDF(x, \alpha, \beta) = \frac{x^{\alpha-1}(1-x)^{\beta-1}}{B(\alpha, \beta)};\ \alpha = 5;$$

$$\mathbf{g(x)} = \mathbf{0.5} \cdot \mathbf{x} + \mathbf{0.5} \cdot \log(\mathbf{X})$$