The haircut bond

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Abstract

In this paper, I describe the haircut bond.
The paper ends with "The End"

Introduction

The haircut bond is the **holy grail** of **institutional** bond traders.
In this paper, I describe the haircut bond.

The haircut bond

A **haircut bond** is a **no-coupon bond** with a **haircut** H that pays face-value $F > 0$ at $t = 0$, has price $P = Fe^{-t-\epsilon}$ for $0 < t \leq \epsilon$, where ϵ is the **time of exercise** and has the price $P = Fe^{-2\epsilon}$ otherwise.

$$P(F, \epsilon, H, t) = F \ \{ \begin{array}{cc} 1 & t = 0 \\ e^{-t-\epsilon} & 0 < t \leq \epsilon \\ e^{-2\epsilon} & otherwise \end{array}$$

The mathematics of the haircut bond

For

$$F > 0 \wedge H > 0 \wedge \epsilon > 0 \wedge s > 0 \wedge s + \epsilon \leq 1$$

we have

$$\frac{F}{P(F, \epsilon, H, 0)} - 1 = \frac{P(F, \epsilon, H, \epsilon + s)}{P(F, \epsilon, H, \epsilon)} - 1 = \frac{P(F, \epsilon, H, 1)}{P(F, \epsilon, H, \epsilon + s)} - 1$$

where s is the **tick size**.

14 examples of haircut bonds

$$F = 47, H = 80, \epsilon = \frac{931}{1011}, s = \frac{38}{1277}$$

$$F = 47, H = 80, \epsilon = \frac{931}{1011}, s = \frac{80}{1011}$$

$$F = 48, H = 35, \epsilon = \frac{9}{10}, s = \frac{80}{1011}$$

$$F = 211, H = 84, \epsilon = \frac{980}{1011}, s = \frac{31}{1011}$$

$$F = 603, H = 90, \epsilon = \frac{59}{113}, s = \frac{23}{1011}$$

$$F = 782, H = 41, \epsilon = \frac{9}{10}, s = \frac{1}{337}$$

$$F = 890, H = 34, \epsilon = \frac{310}{337}, s = \frac{2}{1261}$$

$$F = 930, H = 96, \epsilon = \frac{43}{113}, s = \frac{80}{1011}$$

$$F = 953, H = 25, \epsilon = \frac{977}{1011}, s = \frac{75}{3004}$$

$$F = 961, H = 91, \epsilon = \frac{974}{1011}, s = \frac{13}{690}$$

$$F = 1039, H = 15, \epsilon = \frac{38}{113}, s = \frac{3}{337}$$

$$F = 1153, H = 60, \epsilon = \frac{991}{1011}, s = \frac{2}{2553}$$

$$F = 1166, H = 5, \epsilon = \frac{997}{1011}, s = \frac{7}{521}$$

$$F = 1218, H = 46, \epsilon = \frac{52}{113}, s = \frac{23}{337}$$

The End