Modeling a stressed asset

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Abstract

In this paper, I describe how to model a stressed asset.
The paper ends with "The End"

Introduction

A **stressed asset** is an asset that has **irregular cashflow** and a **non-zero probability of default**.
In this paper, I describe how to model a stressed asset.

Modeling a stressed asset with a risk-adjusted return and a risk-adjusted premium

The equation of a **stressed asset** with price $P \neq 0$ and a probability of default $0 \leq d \leq 1$ with a risk-adjusted return r_{adj} and a risk-adjusted premium p_{adj} is

$$P\left(1 + r_f + p_r\right) = (1 - d)P\left(1 + r_f + r_{adj}\right) + dP\left(1 + r_f + p_{adj}\right)$$

where
$P \neq 0$ is the price of the asset
r_f is the risk-free rate
p_r is the original risk premium
$0 \leq d \leq 1$ is the probability of default
r_{adj} is the risk-adjusted return
p_{adj} is the risk-adjusted premium

Reduction of the equation

This equation reduces to one of at least four major cases in order of the magnitude of irregularity of the cashflow of the asset:

1. **Regularization**

The asset is **de-stressed** by **introducing additional capital** such that

$$d = 0 \wedge p_r = r_{adj}$$

2. **Deferred regularization**

The asset is **de-stressed** by **floating the risk-adjusted return and risk-adjusted premium** such that

$$d \neq 0 \wedge p_{adj} = r_{adj} + \frac{p_r - r_{adj}}{d}$$

3. **Immediate regularization**

The asset is **put in abeyance** to **acquire knowledge of the probability of default** such that

$$p_{adj} \neq r_{adj} \wedge d = \frac{p_r - r_{adj}}{p_{adj} - r_{adj}}$$

4. **Irregularization**

The asset is **allowed to default** to **increase loss reserves** such that

$$d = 1 \wedge p_r = p_{adj}$$

The End