

ESG Risks

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June 6, 2024

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Introduction

Chapter 1

ESG Risks Factor

Retake model from PST 2021

Chapter 2

Sources of ESG Risks

2.1 Cash-Flows and Discount Rate Channels

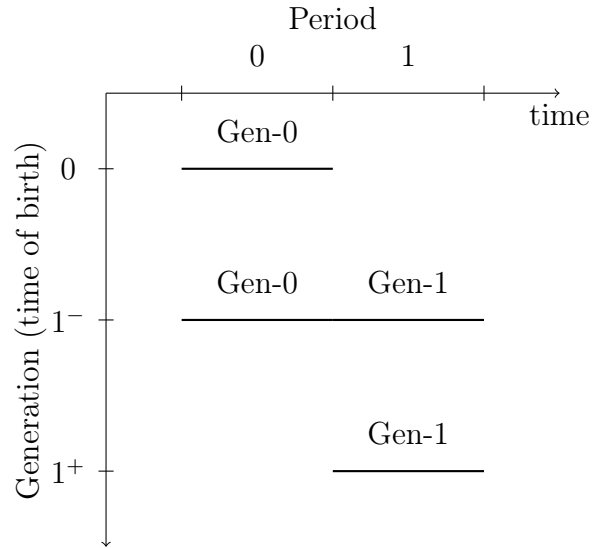


Figure 2.1: The One-Period Overlapping Generation Model

X the payoff (profit) by the firm in period 1. It is known at 1⁻ (the beginning of period 1) but received at 1⁺ (the end of period 1). We denote \tilde{X} this payoff per dollar invested in period 0: $\tilde{X} = \frac{X}{P_0}$.

Assume we have two sources of risk (uncertainty), \tilde{M} a macroeconomic

factor and $\tilde{C}C$ a climate risk factor. These shocks occurs at 1^- . The unexpected payoff in period 1 is:

$$\tilde{X} - E_0(\tilde{X}) = \beta_m \tilde{M} + \beta_{cc} \tilde{C}C + \varepsilon_1 \quad (2.1)$$

The payoff is known at 1^- , so we can compute the price of the stock:

$$\tilde{P}_1 = \beta^{-1} \tilde{X} \quad (2.2)$$

This is the payoff for $Gen - 0$ at 1^- .

It's expected value when $Gen - 0$ invested in period 0 was:

$$E_0(\tilde{P}_1) = \beta^{-1} E_0(\tilde{X}) \quad (2.3)$$

$$\begin{aligned} \tilde{P}_1 &= \frac{P_1}{P_0} \\ &= R_1 \end{aligned} \quad (2.4)$$

$$\begin{aligned} E_0(\tilde{P}_1) &= \frac{E_0(P_1)}{P_0} \\ &= E_0(R_1) \end{aligned} \quad (2.5)$$

So the unexpected change in price for the $Gen - 0$ $\tilde{P}_1 - E_0(\tilde{P}_1)$ is in fact the unexpected return $R_1 - E_0(R_1)$:

$$\begin{aligned} \tilde{P}_1 - E_0(\tilde{P}_1) &= R_1 - E_0(R_1) \\ &= \beta^{-1}(\tilde{X} - E_0(\tilde{X})) \\ &= \beta^{-1}(\beta_m \tilde{M} + \beta_{cc} \tilde{C}C + \varepsilon_1) \end{aligned} \quad (2.6)$$

Chapter 3

Practical Implications of ESG Risks

PST 2022

3.1 Measuring ESG Risks

3.2 Exposure to ESG Risks

