

Stress and Resiliency Testing: Mandelbrotian Grey Swan Scenarios^{*}

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Abstract

In “The Black Swan, The Impact of the Highly Improbably,” Taleb (2010) makes a distinction between extreme scenarios that can be modeled (Mandelbrotian Grey Swans) and those that cannot (Black Swans). A Grey Swan model would consider the power law fractal nature of the markets that Mandelbrot first described in the 1960s. In this paper, we discuss the generation of Mandelbrotian Grey Swan scenarios by using dependent multivariate fractional Brownian motion (DMFBM), as implemented from the methodology in “Basic properties of the Multivariate Fractional Brownian Motion” by Amblard et al. (2010).

We discuss how real world Grey Swan scenarios are excellent choices for stress and resiliency testing. In addition, we provide an example of a set of Grey Swan scenarios, which correspond to the RBC C-3 Phase II Wealth Factors of 2005 Bennet et al. (2006).

Additional advanced material has been added as an addendum.

Keywords: Hurst Exponent, Fractional Brownian Motion, Black Swan, Grey Swan, Stress Testing, Wealth Factors, Multifractal Model of Asset Returns (MMAR).