## The Relationship Between Cat Bond Market and Other Financial Asset Markets:

## Evidence from Cointegration Tests

Chaouki Mouelhi

#### ABSTRACT

This study examines the relationship between Cat Bonds market and the other financial markets. Precisely, cointegration tests (the Engle and Granger's methodology) were applied on weekly data of five indexes over the period 2012- 2019 to test for the existence of a long-run dynamic equilibrium relationship between Cat Bonds market and four financial markets, namely, Insurance Linked Securities (ILS) market, S&P 500 (first stock market), MSCI (second stock market) and Corporate Bonds market. In addition, a comparative analysis correlation vs cointegration was conducted to verify whether Cat Bonds can be really considered as zero-beta assets in the short-run (correlation) as well as the long-run (cointegration). For correlation analysis we employed three correlation coefficients (Pearson's Correlation Coefficient, Spearman's Rank Correlation Coefficient and Kendall's Rank Correlation Coefficient). Overall, the main findings of this study showed that in the short-run, Cat Bonds are partially zero-beta assets while over the long-run they are entirely zero-beta assets. Such results will be of great importance for investors in their decision choice between a short strategy or a long strategy in Cat Bonds' investing.

Reywords: Cat Bonds, zero-beta assets, correlation, cointegration.

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#### I. INTRODUCTION

Natural disasters, terrorism and pandemics do not cause only humanitarian tragedies, but also of enormous economic losses, which can seriously damage insurance and reinsurance companies. For example, Hurricane Katrina caused more than \$80 billion of insured damage in August 2005. The amounts involved show the limits of the traditional insurance system and the value of setting up additional financial capacities. It is in such a context that the world of finance has experienced the emergence of the Insurance Linked Securities (ILS) which reflect a fusion of insurance and finance techniques by enabling the transfer of disaster risk in the capital market. Among the various financial market mechanisms created for this purpose. Cat Bonds are an excellent example of ILS.

Cat Bonds give the investor direct access to insurance risks (catastrophe risks) which are generally independent of market risks. Traditionally, the method used by investors was simply a participation in the capital of an insurance company. However, this does not represent quite a diversification as the results of an insurance company are very dependent on financial market risk. In contrast, Cat Bonds implicitly allow insurance risk to be separated from other financial risks. In other words, portfolio diversification theory tends to make these Cat Bonds very attractive to investors.

Indeed, Cat Bonds has the following additional advantages. Cat Bonds generally earn interest well above market rates to offset the risk of default on coupons or principal payments by the Special Purpose Vehicle (SPV) in the event of a major disaster; the probability of losing money by investing in Cat Bonds is very low and the Sharpe ratio of Cat Bonds is commonly greater than 0.5, which is above of most other bonds securities for which this measurement is available. In addition, investors are increasingly interested in Cat Bonds because of their high expected yield and potential low correlation with other financial assets. It is in this context that we ask: Are investors right to consider Cat bonds as an asset allowing effective portfolio diversification?

Several studies have found a weak or even almost zero correlation between Cat Bonds market and the other financial markets, particularly, the stock market and the bond market. The results of these studies presented Cat Bonds as zero-beta assets and so the best for achieving portfolio diversification.

However, for Cat Bonds to be truly an effective portfolio diversification tool, two conditions should be met. First, the financial markets should not be affected by the occurrence of a natural disaster and second the Cat Bonds market should not be affected by financial crisis. Results of studies on these two conditions were rather mixed, which has called into question the validity of the assumption that Cat Bonds are zero-beta assets.

In this paper, we take a different approach to the issue by testing the existence of a long-run equilibrium relationship between Cat Bond market and the other financial markets. In other words, we test the cointegration between Cat Bonds market and the other financial markets. To the best of our knowledge, there is no empirical analysis on the cointegration.

# **Cats Cointegration Manual**

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