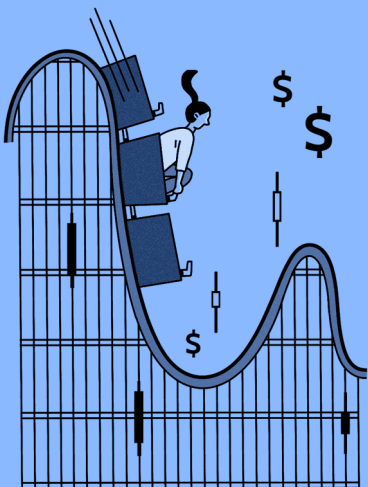


QUESTION 6 - MSCI FUNDS

Carel Olivier




The illustration shows a person sitting on a roller coaster car, which is positioned on a track that resembles a financial candlestick chart. The track has several peaks and valleys, with dollar signs (\$) and a question mark (?) floating around it. The person is looking down at the track, suggesting uncertainty or risk. The background is a solid blue color.

**Generalized
Autoregressive
Conditional
Heteroskedasticity
(GARCH)**

*[ˈje-nə-rə-,līzd ˈò-(.)tō-ri-ˈgre-siv kən-
ˈdish-nəl ˈhe-tə-,rō-ˈske-,dɑ-ˈsti-sə-tē]*

An approach to estimating
the volatility of financial
markets.

 Investopedia

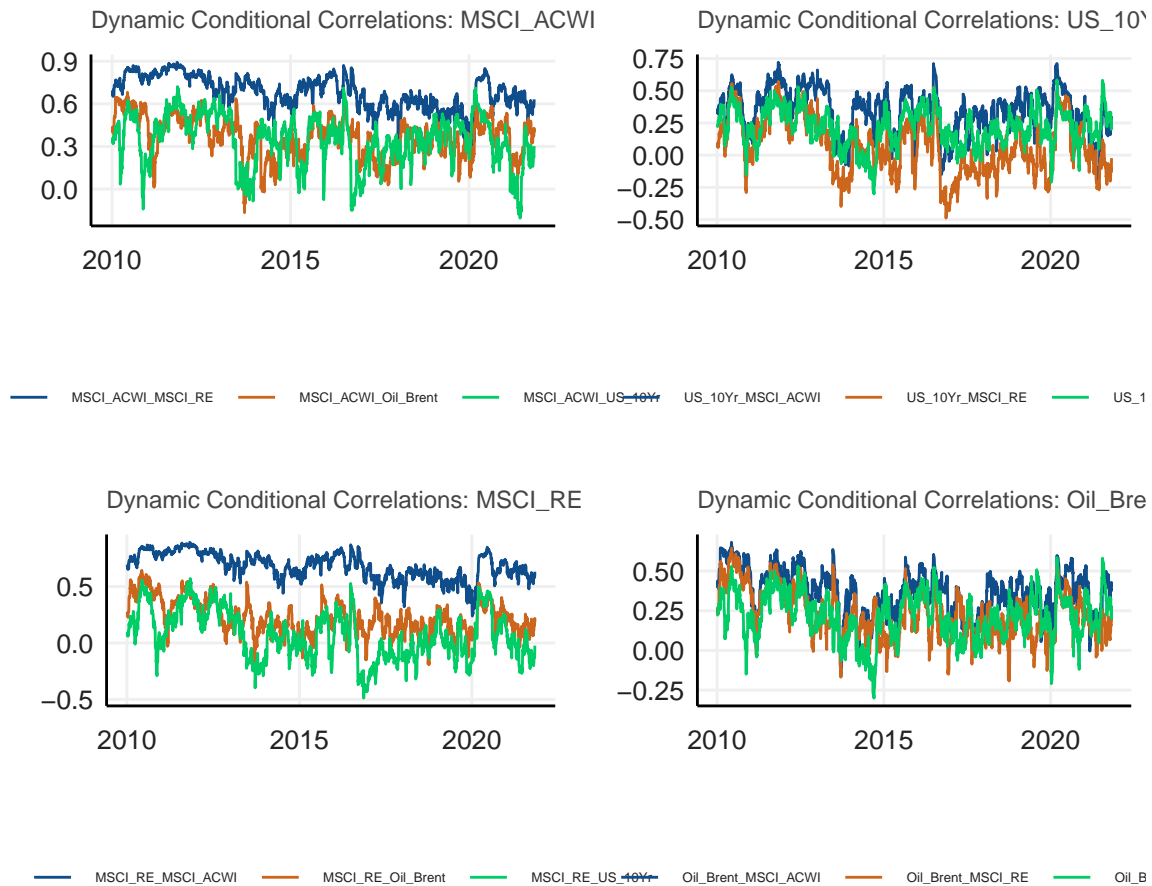
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1. Short Introduction

Diversification across various asset classes is a pivotal step for portfolio construction due to its risk-mitigating capabilities. As such, I will explore if the return profiles of different asset classes (Equities, Commodities, Real Estate and Bonds) have increased in their convergence. In other words, if diversification by holding different asset classes have reduced.

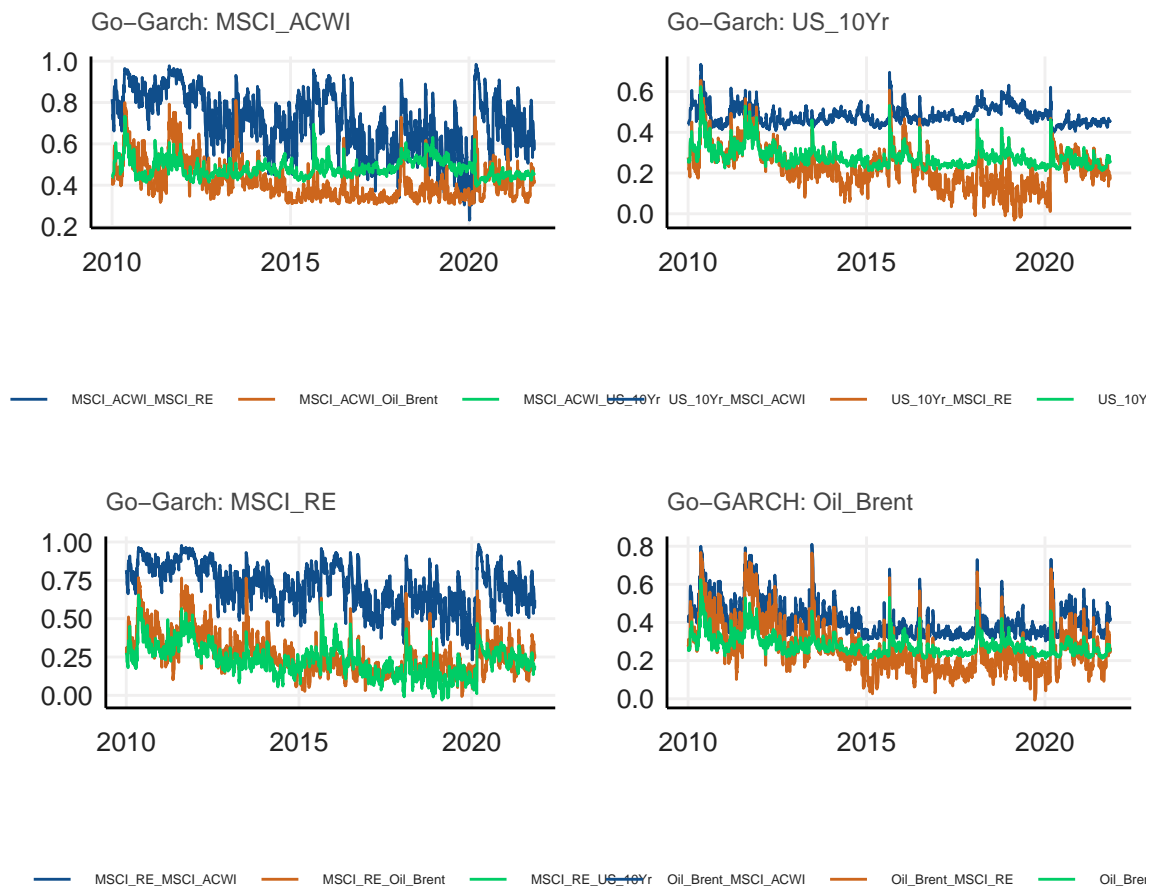
To measure correlation between assets classes, I will use dynamic conditional correlation (DCC) and Go-Garch to model for equities, bonds, real estate and commodity.model.

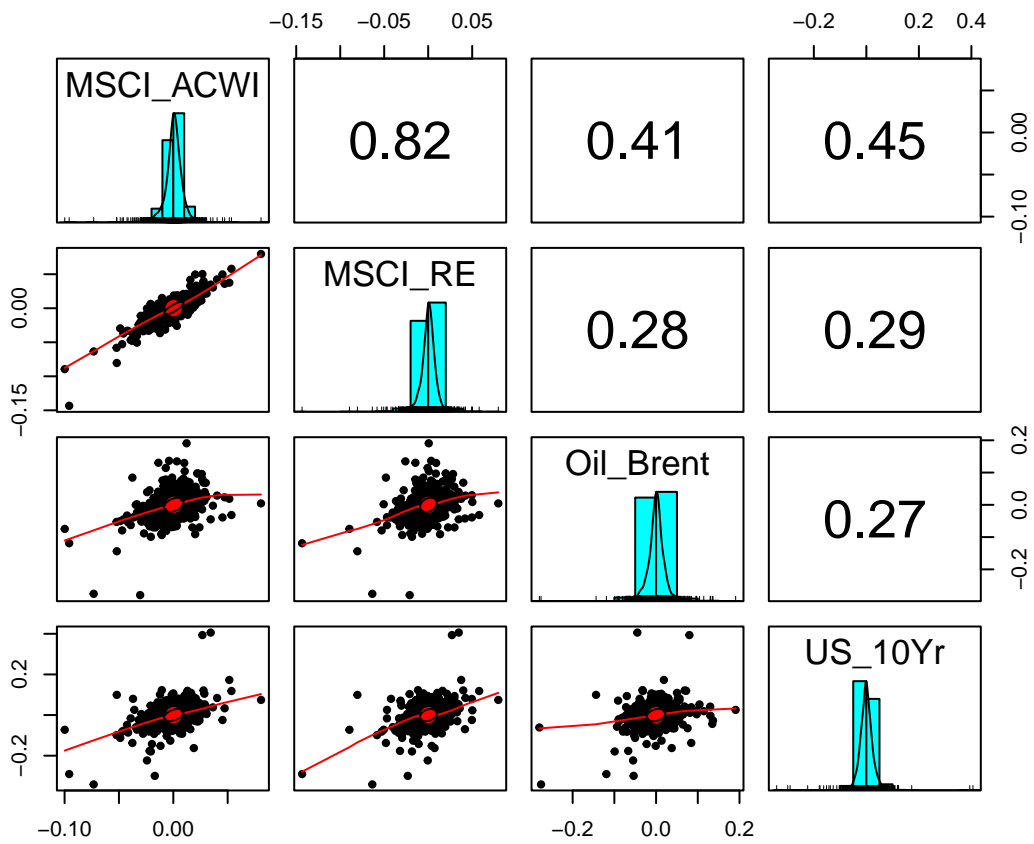
The MARCH test indicates that all the MV portmanteau tests reject the null of no conditional heteroskedasticity, motivating our use of MVGARCH models. Let's set up the model

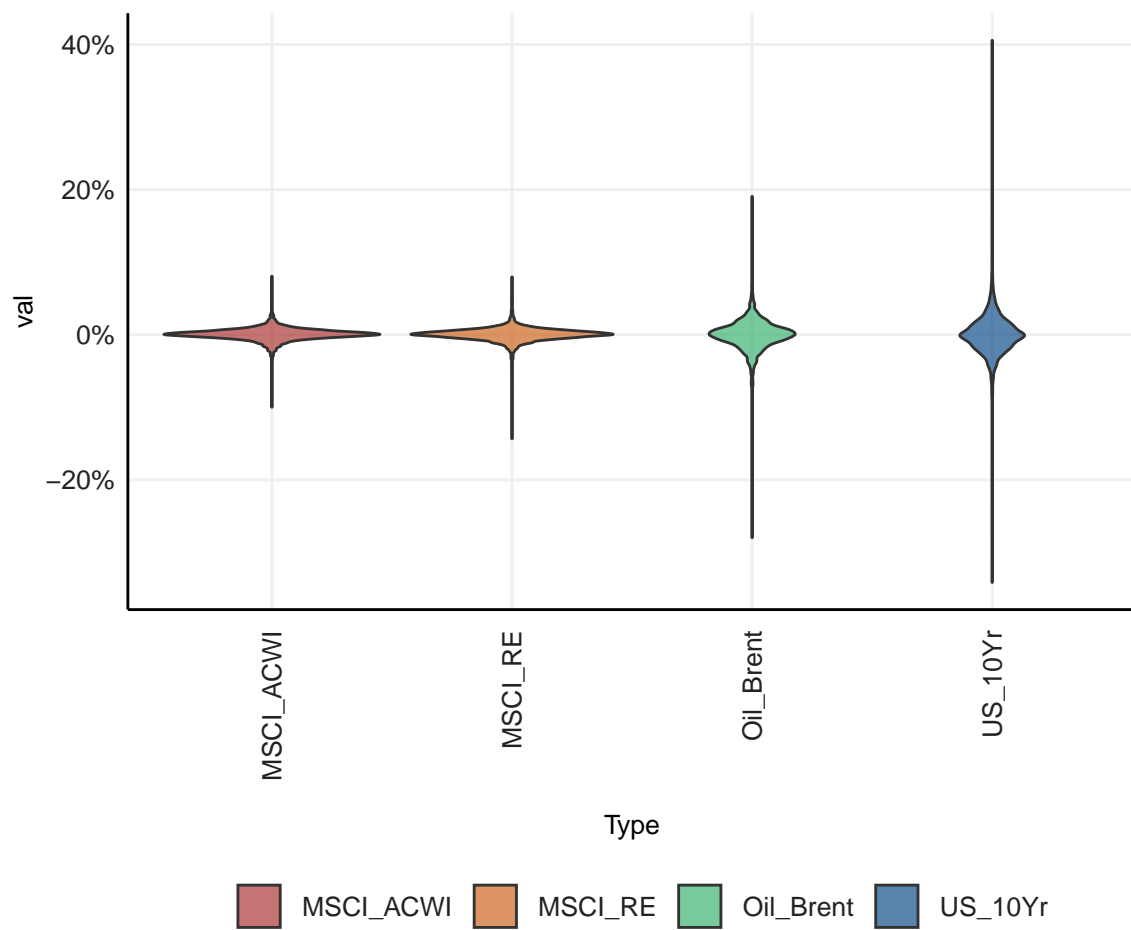


2. Go Garch

Although efficient, the DCC model estimations makes some strong assumptionss, e.g., it assumes a constant structure to the correlation dynamics. Therefore, I will also use The GoGARCH model which is highly efficient uses less parameter intensive estimation techniques to decompose the var-covar matrix into orthogonal sources of volatility







The US 10 year bond shows the highest degree of dispersion, followed by Oil, and clearly follows a different distribution process to the other two indices.