

Abstract

The relationship between capital markets and geographic regional organisations has been of interest of late. One such geographical organisation is the Brazil, Russia, India, China and South Africa (from here, BRICS) nation, which was “formed” in 2010. The BRICS nation is underpinned by three traits; (i) government is very central to driving the economy, (ii) ruling elites stay in power for a longer period and (iii) government tends to combine free market and socialism. Prior studies explored the economic impact of the BRICS nation; however, it seems no study has explored volatility spillovers of the BRICS nation emanating from indices (bonds, commodities, equities and listed real estate). This thesis studies volatility spillovers of those indices; firstly, using the VAR model and validating with the Markov-Regime Switching Model. The first set of results illustrates that spillovers are non-directional and interestingly, illiquid indices converge faster than liquid indices. The second hypothesis finds that the GARCH(1,1) model has shortcomings, such as not accounting for (i) correlation coefficients of debt and equity, (ii) equity parameter, (iii) risk premium, (iv) interest rates and (v) shocks-stock markets. Then, the capitalised GARCH(1,1) is “created” to address the shortcomings of the GARCH(1,1). The results and validation of Hypothesis Two illustrate that the capitalised GARCH(1,1) outperforms and is more robust than the GARCH(1,1). Generally, structural breaks are central to risk management. Hypothesis Three addresses the latter statement by using integral transforms (i.e. Fourier and Laplace) and unit root tests (Augmented Dickey Fuller, Augmented Dickey Fuller-GLS, Phillip-Perron and Zivot-Andrews). The third hypothesis confirms that derivative structural break points precede algebraic structural break points. Similarly, unit root tests confirm the presence of structural break points. Interestingly, integral transforms confirm the presence of dozens and dozens of evident and hidden structural break points. The findings of this thesis should apply to any geographic organisation with similar characteristics to the BRICS nation. The main contributions from this study is that (i) volatility spillovers are non-directional in nature, and can be in-between or across transatlantic indices, (ii) discrete volatilities such GARCH(1,1) can be extended such it accounts for debt and equity composition and (iii) finally, there are evident and hidden structural break points. Each investment vehicle or product needs its own tailored risk management models because volatility models need to be improved from time to time. Finally, in order to detect structural break points, more advanced techniques such as integral transforms should be used in conjunction with other common diagnostic structural break tests.

Keywords: GARCH, integral transforms, Markov-regime switching, structural break points, VAR(1,1), volatility spillovers

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