

## THE INTEGRATION BETWEEN ISLAMIC AND SECTORIAL INDICES: EVIDENCE FROM CHINA BASED ON MULTIVARIATE-GARCH

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### Abstract

**Purpose** – The purpose of this paper is to investigate the extent to which Chinese equity investors can benefit from diversifying their portfolio into Shariah-compliant (Islamic) indices. It examines three Islamic stock indices (FTSE Shariah China price index, MSCI China Islamic IMI price index and the DJ Islamic Greater China price index) and ten sectorial indices in Shanghai Stock Exchange including sectors of energy, materials, industrials consumer discretionary, consumer staples, health care, financials, information technology, telecommunication and utilities as a sample.

**Design/methodology/approach** – The multivariate GARCH-dynamic conditional correlation is deployed to estimate the time-varying linkages of returns of the selected indices, covering approximately eight years daily data starting from 28 August 2009 to 29 September 2017.

**Findings** – In general, in terms of volatility, the results indicate that all Islamic Indices are less volatile than the conventional indices. From the correlation analysis, the results tend to illustrate that Chinese conventional equity investors would benefit from Islamic stock indices, especially when they include DJ Islamic Greater China in their portfolio. Besides, conventional investors who invest predominantly in the conventional sectors of health care, consumer staples and information technology are set to benefit most from diversifying their portfolios in Islamic stock indices because of the weak correlations of returns.

**Originality/value** – The findings of this paper may have several significant implications for the Chinese equity investors and fund managers to have a better understanding about return correlations between the Chinese conventional sectorial indices and the Shariah-compliant stock indices with the purpose of gaining higher risk-adjusted returns through portfolio diversification. With regard to policy implications, the findings provide useful insights for Chinese policymakers into formulating new economic stabilization policies to further promote the development of Shariah-compliant capital market in China, and then promote the development of Chinese economy.

**Keywords:** Islamic finance, Equity markets, Chinese Islamic stock indices, Chinese sectorial indices, MGARCH, Portfolio diversification benefit

**Paper type:** Research paper

### Introduction

Investment is a principal means to increase wealth. Commonly, investors or fund managers take steps to minimise the risks of investment. One of the most important strategies is investment diversification, which is widely used in various classes of assets including commodities, real estate, stocks and bonds at national and international markets. In 1952, Markowitz established the modern portfolio theory which implies that the choice of portfolio is based on the expected return and variance of return of underlying assets. Specifically, the investors are aimed at maximizing the expected returns with reduced risks. After that, Tobin (1958), Grubel (1968), Levy and Sarnat (1970) had made significant contributions into the theories of portfolio selections and investment diversifications.

Basically, asset correlation is a measure that statistically indicates the interdependence between two or more assets (Saiti et al., 2014). A high correlation between assets in an investment portfolio means the investment will move in the same direction at the same time and is thereby exposed to

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higher risk. Lower levels of correlation means lower levels of risk. Maximising returns with the lowest potential risk is determined by asset correlation in the asset allocation process. Some countries have very open policies for cross-border investment, which helps local investors diversify their assets abroad if there is a lower correlation in the stocks of other countries compared to the local market (Masih and Masih, 1997). Specifically, some researches (Longin and Solnik, 1995; Johnson and Soenen, 2002; Emiris, 2004; Shabri Abd Majid et al., 2009; Uddin, Arouri and Tiwari, 2014; Arslanalp et al., 2016) investigated the international conventional capital markets, finding the positive increased correlations among global markets in general. Besides, Investment in a cross-sectorial level in the domestic market is also regarded as a comparatively useful strategy to decrease asset correlation if the correlation between sectors is low. As mentions in some researches (Ma,2010; Gao and Yan, 2010; Yao & Cai, 2013; Liu, 2013; Wu, 2013; Sharma and Banerjee, 2015), investments in different sectors with low correlations have brought diversification benefits to investors to some extent while sectors have become more integrated as well.

On the other hand, with the rapid development of Islamic finance industry including Islamic capital markets, Islamic investment has become a viable alternative for diversifying investments. Consequently, a significant new approach to diversification benefits suggests that investors are likely to gain benefits by investing in the portfolio covering both conventional and Islamic investments (Arshad and Rizvi, 2013; Saiti and Masih, 2014; Saiti, Bacha and Masih, 2014; Rizvi & Arshad, 2014; Majdoub and Mansour, 2014; Mensi et al., 2015; Medhioub and Chaffai, 2016). For example, by using the MGARCH-DCC model, Saiti and Noordin (2016) analysed the time-varying linkages of selected conventional and Islamic plus Asian and international stock index returns with the Malaysian stock index returns based on daily data in an eight-year period from 29 June 2007 to 30 June 2016. It is found that the volatility in both Asian and international Islamic stock indices are more or less volatile than its conventional counterparts. While compared with China, India, Hong Kong and the Southeast Asian region, the lowest correlations in both the conventional and Islamic MSCI indices of Japan could offer more diversification benefits in Asian regions. Also, as compared to France, UK, Germany, Canada and Switzerland, the comparatively low correlation in both the conventional and Islamic MSCI indices of the US showed a higher level of diversification benefits at the international level. Based on the mixed findings from previous studies, this study is driven to provide the Chinese conventional investors and fund managers with more recent evidence on the correlations between different domestic sectorial indices and Chinese Shariah-compliant indices to identify any benefits that can be derived from the mixed conventional cross-sectorial and Islamic investment diversifications on a continuous basis.

Thirty years after China's reform and opening up policy, China has made remarkable achievements in the economic development. Starting from 2010, China has become the super country with second largest GDP in the world. At the same time, Shanghai Stock Exchange, as the largest stock exchange in China, has become one of the top ten stock exchanges in global. Even though there is no Islamic finance in China now, the increasing cooperation between China and other Muslim countries, especially those in the 'One Silk One Road' plan, creates space for great potential for China to develop Islamic finance in the future. Consequently, capital markets, as a significant part of finance, play a major role in the economic system. Nevertheless, limited research has concentrated on the connection of Islamic finance in Chinese capital markets. As a result, this study is the first to explore the correlation of China's *Shariah*-compliant indices and conventional sectorial indices to ascertain whether investment under the principles of *Shariah* can benefit Chinese investors. In the long-run, if diversification benefits can be found between Islamic stock

indices and conventional stock indices, it will not only attract more investors to distribute money in *Shariah*-compliant stocks but also likely lead to the faster and deeper development of independent Islamic stock indices in China.

This primary objective of this study is to investigate the dynamic conditional correlation between the returns of three Islamic indices for China (FTSE Shariah China price index, MSCI China Islamic IMI price index and DJ Islamic Greater China price index) and the returns of ten sectorial indices in the Shanghai Stock Exchange covering the sectors of energy, material, industrials, consumer discretionary, consumer staples, health care, financials, information technology, telecommunication and utilities to identify the diversification benefits that can be derived from Islamic investment. Examining the dynamic conditional correlation between the returns of different sectorial indices in the Shanghai Stock Exchange and the three Islamic indices for China helps answer as to whether Chinese investors can benefit from diversifying investments into Islamic stock indices and whether the Islamic indices are safe-havens for Chinese investors.

The findings of this research may have several significant implications for the Chinese equity investors and fund managers to understand the return correlations between China's Islamic indices the conventional SSE sector indices with the purpose to gain higher risk-adjusted returns through portfolio diversification. In conclusion, this research's empirical findings provide useful insights for Chinese equity investors to gain potential profits by adding investments in *Shariah*-compliant indices. Furthermore, it may raise the awareness of policymakers to formulate new economic stabilization policies to further promote the development of *Shariah*-compliant capital market in China, and then promote the development of Chinese economy.

In case of literature review, there is almost no studies on whether Islamic stock indices can provide any diversification benefits to Chinese investors. Therefore, this paper tries to fulfil the gap whether Chinese investors can benefit from Islamic investment. The Islamic investment may attract Chinese investors if we prove that Islamic investment can help them in the case of portfolio diversification.

In the case of Methodology, this research will adopt the Multivariate GARCH- DCC approach as used by Saiti et al. (2014) to precisely indicate changes in volatility and correlation of the selected indices over time, together with its directions (positive or negative) and magnitude (stronger or weaker). Specifically, the Multivariate GARCH- DCC model involves two steps estimations. Firstly, it is important to estimate the conditional variances of each price index by using the following univariate GARCH ( $X, Y$ ) model, given  $k$  number of index returns;

$$h_{it} = \omega_i + \sum_{x=1}^{X_i} \alpha_{ix} r_{it-x}^2 + \sum_{y=1}^{Y_i} \beta_{iy} h_{it-y}, \text{ for } i = 1, 2, \dots, k$$

In the formula,  $\omega_i$ ,  $\alpha_{ix}$  and  $\beta_{iy}$  must be non-negative and  $\sum_{x=1}^{X_i} \alpha_{ix} + \sum_{y=1}^{Y_i} \beta_{iy} < 1$ .  $h_{it}$  represents the estimated conditional variance of individual index,  $\alpha_{ix}$  and  $\beta_{iy}$  stands for shocks to return X and the contribution of shocks to return Y to a short-run persistence (the ARCH effects) and long-run persistence (the GARCH effects) respectively.

## Results and Concluding marks

This research seeks to assist Chinese conventional equity investors to identify potential portfolio diversification benefits by examining the dynamic conditional correlations between the returns of three selected Chinese Islamic indices which are FTSE Shariah China price index, MSCI China Islamic IMI price index and DJ Islamic Greater China price index and the returns of the ten Shanghai Stock Exchange Sector indices for the energy, material, industrials, consumer discretionary, consumer staples, health care, financials, information technology, telecommunication and utilities sectors. The multivariate GARCH-dynamic conditional correlation is applied to estimate the time-varying linkages of the selected Islamic and conventional indices returns, covering approximately eight years daily starting from 28 August 2009 to 29 September 2017.

Summarily, from the preliminary test, we find that t-distribution model is more appropriate for capturing the fat-tailed nature of the distribution of all indices returns compared to the normal distribution model. Under the t-DCC model, the parameters of time-varying conditional volatility in both the Islamic and conventional indices are highly significant, representing that the shocks to the returns volatilities are not permanent hence the riskiness associated with the stock returns may gradually diminish.

The results of the analysis illustrate that the conventional SSE sector indices have a higher range of unconditional volatilities compared to the three Islamic indices. Besides, in the Islamic indices, the DJ Islamic Greater China price index is found to be least volatile compared to the other two Islamic indices. Nevertheless, the unconditional correlations among Islamic indices are significantly high, mostly caused by the similar *Shariah* screening methodologies. The results also show that the returns in the sectors of materials, energy and financials record the highest degrees of unconditional correlations with the three Islamic indices compared to that of other sectors. Besides, the correlations of returns in the sectors of industries, consumer discretionary and utilities are in the comparative middle level among ten groups of data. Nevertheless, weak (lowest) unconditional correlations of returns are recorded between three China's Islamic indices and indices in the sectors of health care, consumer staples and information technology. This denotes that the Chinese conventional equity investors would gain different levels of diversification benefits if they were to diversify their assets into the Islamic or *Shariah*-compliant indices in China. Furthermore, our findings suggest that the Chinese Islamic investors would benefit most by investing in both Islamic indices and the China's conventional indices especially in the health care sector, consumer staples sector and information technology sector because of the weak correlations returns compared to the other sectors with the Islamic indices.

Lastly, we confirm the previous findings on the unconditional volatilities and correlations by plotting the dynamic conditional volatilities and correlations of both Islamic and conventional price indices. Based on the plots, the highest increase in the conditional volatilities and a high convergence of returns volatility among all Islamic and conventional stock indices were spotted during the 2015 financial crisis in China's capital market. The plots also show that the degree of correlation between the returns of DJ Islamic Greater China price index and SSE Sector indices was lower than that of the other two Islamic indices in the majority of the research period. Besides, the returns correlations between SSE sector indices and both the FTSE Shariah China price index and MSCI China Islamic IMI price index seem to move closely to each other over time. Therefore, the plots may signify a great level of financial integration between FTSE Shariah China price index and MSCI China Islamic IMI price index which may become unfavourable for investors and

portfolio managers to invest at the same time as it provides less portfolio diversification opportunities.

The findings of this research may have several significant implications for the Chinese equity investors and fund managers to understand the return correlations between China's Islamic indices the conventional SSE sector indices with the purpose to gain higher risk-adjusted returns through portfolio diversification. In conclusion, this research's empirical findings provide useful insights for Chinese equity investors to gain potential profits by adding investments in *Shariah*-compliant indices. Furthermore, it may raise the awareness of policymakers to formulate new economic stabilization policies to further promote the development of *Shariah*-compliant capital market in China, and then promote the development of Chinese economy.

Nevertheless, this research also has some limitations. Firstly, this study only referred to the China's Shanghai Stock Exchange, which can be further enriched by adding the Shenzhen Stock Exchange which is the second largest capital market in China. Future studies could conduct similar analysis using various conventional sector indices and Islamic indices in other non-Muslim countries. In providing a more comprehensive understanding of return linkages to the potential Islamic investors in China, future studies may also include more specific stocks from different industries in one sector such as petroleum industry, gas industry and electrical power industry in the energy sector to investigate the industrial correlations of returns with Islamic market in the China.

In addition, even though the stocks of indices are derived from China's equity market, and the majority of our samples are listed in Chinese Yuan, the DJ Islamic Greater China Index and FTSE Shariah China Index are listed in US dollar. In order to unite the currency, we converted the data based on US dollar into the adjusted data in Chinese Yuan by taking the daily currency exchange rate from US dollar to Chinese Yuan. This means that the currency exchange rate influences our data even though it is limited.

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