



Time-varying evidence of efficiency, decoupling, and diversification of conventional and Islamic stocks

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ABSTRACT

This study investigates the efficiency of conventional and Islamic stock markets and their diversification potential by using multifractal de-trended fluctuation analysis (MF-DFA), wavelet squared coherence (WTC) and wavelet Value-at-Risk (VaR). Evidence from regional and country-level markets indicates Islamic stocks are less efficient than conventional ones in the short term, however more efficient in the medium term. Conventional stocks in the UK, Japan, and emerging markets are more efficient than the Islamic ones in the long term, whereas those from the US and Europe are less efficient. The wavelet VaR shows that conventional stock markets are at least as risky as the Islamic ones.

1. Introduction

Recent studies in the finance literature investigating the characteristics and relative advantages of conventional and Islamic equity markets have pointed out the dynamic differences between them in risk and return. These risks and return profiles differences have, in turn, led international portfolio investors and hedging practitioners to ponder over the diversification and hedging potential Islamic asset classes offer in reducing exposure to the various types of risks—market, liquidity, unsystematic, and systemic (Dania & Malhotra, 2013; Hammoudeh, Mensi, Reboredo, & Nguyen, 2014; Hassan & Girard, 2010; Kok, Giorgioni, & Laws, 2009; Saâdaoui, Naifar, & Aldohaiman, 2017).³ Further, particular attention has been paid to the marginal and joint behaviour of these asset classes during times of financial turmoil, as

Islamic equity markets have shown to move and co-move in dissimilar directions, relative to their conventional counterparts (El Khamlichi et al., 2014; Guyot, 2011; Mensi et al., 2015). These marginal and dependence characteristics have created a perception of Islamic finance products and assets as being suitable for portfolio risk mitigation and diversification. For global portfolio investors, it is important to know whether the correlation between Islamic and conventional stock prices is positive or negative. If the correlation is positive but low, Islamic stocks can be used as a diversifier of conventional stocks. If Islamic stock markets have a weak interaction with each other or are decoupled from the conventional ones, the former type of equities could offer some insurance against losses caused by investing in conventional stock markets.⁴ In relation to the efficiency of Islamic and conventional markets, there is a general perception about the former—despite having

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³ Some studies have found evidence of Islamic stocks being used as diversifiers for conventional stock (Dania & Malhotra, 2013; Hammoudeh et al., 2014; Hassan & Girard, 2010; Kok et al., 2009; Saâdaoui et al., 2017); others have indicated that Islamic stocks can be used as a hedge against conventional stocks (El Khamlichi, Sarkar, Arouri, & Teulon, 2014; Guyot, 2011; Mensi, Hammoudeh, Reboredo, & Nguyen, 2015). On the contrary, Álvarez-Díaz, Hammoudeh, and Gupta (2014) finds relatively high forecastability in Islamic stock markets, making them unsuitable candidates for risk diversification and hedging in asset allocation.

⁴ A diversifier is defined as an asset that is, on average, positively (but not perfectly) correlated with another asset or portfolio. A hedge is defined as an asset that is, on average, uncorrelated or negatively correlated with another asset or portfolio (for further details refer to Bracker & Koch, 1999; Grubel, 1968; Levy & Sarnat, 1970; Rezayat & Yavas, 2006; Solnik, 1974; Baur & Lucey, 2010).

reached a size of USD 2 trillion—being less efficient, perhaps due to Sharia compliance and other restrictions seen by many investors as financial frictions.⁵ However, are Islamic stock markets really less efficient than conventional stock markets? This question is one of the main motivations for our research study.

Stock market efficiency is understood as capital markets (or security prices) fully, swiftly, and correctly reflecting all relevant and available information (Malkiel, 1992). For Jensen (1978), markets are efficient when there is no possibility to make above average returns (i.e., outperform the market portfolio) by trading on the basis of the information set θ_t . In this regard, the efficient market hypothesis (EMH) is a backbreaker for forecasters (Timmermann & Granger, 2004), as it states that the dynamics of prices and returns are unforeseeable and cannot be forecast. Hence, if an Islamic or conventional stock market is efficient, it is neither possible to forecast the future value of stock prices in these asset categories, nor is it possible to make excess returns by rebalancing the portfolio. Further, if some financial stock markets are inefficient, it is implied that some driving factors link one stock market with others. These factors will, in turn, cause integration of those markets. Once market integration takes place, information in some markets can be effectively used to predict movements in other interlinked markets, providing reasons for diversification. As a result, the concepts of inefficiency (efficiency), integration, and diversification are intertwined. On the contrary, if stock markets are efficient, there appears to be no trading strategy, based either on a variety of valuation ratios or on technical analysis of price movement patterns, that would enable investors to outperform a passive buy and hold strategy (Malkiel, 2003; Mankiw, 2013).⁶

In the context of the aforementioned differences between Islamic and conventional equity markets, and in the light of three key concepts—efficiency, integration and diversification—we implement multifractal de-trended fluctuation analysis, wavelet squared coherence, wavelet Value-at-Risk (VaR), percentage of total volume (PTV), and percentage of significant area (PSA) models to examine the time-varying features of efficiency, integration, and diversification in Islamic and conventional stock markets.⁷ We specifically investigate three regional (world, emerging market, and Europe) and three country (US, UK, and Japan) stock markets in both asset categories. The motivation for the study lies in the importance of measuring and determining, through the implementation of cutting-edge modelling techniques, the asset class of equity markets (Islamic or conventional) that is more efficient, and thus, offers greater diversification benefits. Thus, a relative comparison is at the core of our research study.

We contribute to the relevant literature on three fronts. Firstly, by means of the cutting edge modelling framework considered, we are able to draw useful insights and implications about risk characteristics, diversification potential, and efficiency in global Islamic and conventional equity markets. Secondly, the modelling framework considered is robust as it investigates the data sets under consideration from multiple angles. Specifically, the multifractal de-trended fluctuation analysis and wavelet squared coherence allow for the modelling of efficiency at various time horizons (domains) and frequencies, that is, short term, medium term and long term. The Wavelet VaR enables us to uncover time-varying features of decoupling (or integration) and diversification between conventional and Islamic stock markets, while capturing the trend co-movements between pairs of stocks. Thirdly, to the best of our knowledge, this study is the first to implement on the data set under

consideration the specific type of modelling framework propose. Other studies in the field have implemented some of these models to data sets of different composition.

The empirical results show that Islamic equities can provide diversification benefits to portfolios consisting of conventional equities. The relative levels of stock market efficiency are acknowledged to be dependent on the investment horizon and financial period scenario under consideration. Specifically, Islamic equities are observed to be less efficient than the conventional ones in the short term and more efficient in the medium term. Conventional equities from the UK, Japan, and the emerging markets display higher efficiency levels than the Islamic ones in the long term, while the Islamic ones from the US and Europe are more efficient than their conventional counterparts. The wavelet VaR shows that conventional equity markets are at least as risky as the Islamic ones for each of the financial period scenarios under consideration, and for the GFC and post-GFC scenarios in particular. However, in the long and medium term, and during the European sovereign debt crisis, the Islamic markets appear to be riskier.

The results suggest that domestic and international equity portfolio investors may benefit by considering the dynamic risk, efficiency, and diversification differences between the conventional and Islamic equity markets modelled to primarily improve the rebalancing, hedging, and diversification of portfolios, and possibly the portfolio return. Particularly important for investors is the consideration of efficiency characteristics in Islamic and conventional stocks for the short, medium, and long terms.

The remainder of the paper is organized as follows. In Section 2 we conduct a review of the relevant literature. Section 3 explains the methodological framework implemented. Section 4 justifies the selection of the considered Islamic and conventional equity markets. Section 5 reports and discusses the empirical results. Section 6 concludes the analysis.

2. Literature review

In this section we first review the relevant literature dealing with the efficiency and performance of Islamic stock markets, in relation to conventional stock markets. Next, we look at relevant literature analysing the causal linkages between those two types of stock markets, as well as the literature showing that Islamic stocks can be used to hedge against conventional stocks. Further, we examine research indicating that the diversification benefits of Islamic stocks are weak, as well as research dealing with the implementation of multifractal de-trended fluctuation analysis, wavelet methods for efficiency, time-varying feature decoupling, and diversification analysis in Islamic equity markets.

On the specific subject of efficiency in stock markets the literature shows mixed empirical evidence, with some studies acknowledging Islamic stock markets as less efficient than the conventional ones. In this respect Odabasi, Aksu, and Akgiray (2004) through the application of both parametric and non-parametric tests of the random walk hypothesis find the Turkish stock market has become more efficient over time. The comparison by Sensoy, Aras, and Hacihasanoglu (2015) of the time-varying non-linear predictability patterns of conventional and Islamic markets, and analysis of the weak-form efficiency in these markets, indicates that all markets considered display different degrees of time-varying predictability. In addition to that, all conventional markets are acknowledged as being more efficient than their Islamic counterparts. Al-Khazali, Leduc, and Alsayed (2016) use several tests to compare Islamic and conventional stock markets and find that the former are less efficient. These markets, however, are more efficient during times of financial turbulence (i.e., during market downturns). Arshad, Rizvi, Ghani, and Duasa's (2016) analysis of the weak-form efficiency in the Organization of Islamic Conference (OIC) member stock markets during different business cycles indicates that OIC markets are not efficient; however, their efficiency is seen to have improved over the past decade. Mensi, Tiwari, and Yoon (2017) in the context of

⁵ <http://www.worldbank.org/en/topic/financialsector/brief/islamic-finance> (26th Nov, 2017).

⁶ Malkiel (2003) argues that if we consider additional expenses of active management, such as management fees, taxes, and trading costs, a passive management or passive investing strategy is effective even if markets are inefficient.

⁷ It is worth mentioning that in our empirical analysis we only consider the weak-form efficiency (not the semi-strong or strong forms), as MF-DFA approach can only be used to test the weak-form efficiency.

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