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Volatility spillover and hedging strategies between Islamic and conventional stocks in the presence of asymmetry and long memory

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ABSTRACT

In this paper we study the dynamic relationship between Islamic and conventional stock markets. We use six Dow Jones Islamic indices and their conventional counterparts. We adopt both univariate and multivariate GARCH type models for the period 2000–2014. The findings show that the DCC-FIAPARCH is the best to model conditional heteroskedsticity among three multivariate GARCH specifications.

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Contents

1. Introduction 596
2. The literature review 596
3. Methodology 597
   3.1. The univariate GARCH, FIGARCH and FIAPARCH models 597
   3.2. The multivariate DCC-FIAPARCH model 598
4. Data and preliminary statistics 599
5. The empirical results 602
   5.1. The univariate GARCH-type models 602
   5.2. The multivariate DCC-FIAPARCH model 606
   5.3. The DCC behavior during different periods of the subprime crisis 608
   5.4. Portfolio management and hedging strategies 609
6. Conclusion 610
   References 610

The results point to strong evidence of asymmetry and long memory in the conditional variances of all the series. In addition, it is more profitable to hold DJUSI and DJEMGI Islamic indices than their conventional counterparts in the portfolio. Finally, a diversified portfolio consisting of Islamic and conventional indices increases the risk-adjusted performance of the resulting portfolio. The results provide crucial implications for investors' portfolio choices during the phases of the subprime crisis.

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1. Introduction

After the 2007 global financial crisis, investors have been interested in the ethics of financial practices. Some financial analysts wonder whether finance has lost its principal role, i.e. developing the economy. Given the recent challenges faced by the financial system, ethical investment also known as "social responsibility investment" has emerged. This type of investment reflects capital growth and its impact on the environment. Islamic finance can be considered sometimes as a part of ethical investment even if it differs in origin and foundation from conventional finance. In Islamic finance, the Sharia[1] is the way to implement some types of social responsibility investment. Theologians have transposed the standards set by the Sharia to make them applicable on all areas of finance. Nowadays, an investor wishing to invest in an 'ethical' manner has the choice between different types of ethical investments including Islamic investment or Sharia compliant investment.

The fundamental difference between Islamic and conventional finance lies in the operating rules not in the end itself. To satisfy the undeniable Muslim population's demand for Islamic financial products, financial analysts have developed investment products in accordance with Sharia compliant principles. Even if financial products based on Sharia remain confined to a niche market, they are now becoming diverse and gaining ground even in non-Muslim communities. Many economists primarily associated this development to the 1970's oil boom. On the one hand, based on Islamic faith, some Muslims preferred to preserve their money rather than resort to the conventional system, namely interest-based and Sharia-prohibed products. On the other hand, others relied on cash excess from oil revenues.

In February 1999, the Dow Jones Islamic Market (DJIM) Index was launched in the United States in accordance with the principles of Sharia. It was a global index targeting all sectors in accordance with Sharia and ensuring international geographical coverage. Control and screening tasks in this index were accomplished by an independent Sharia Board expressing its views vis-a-vis companies in the index.

As Islamic financial products, we find stock market indices, mutual funds, hedge funds and sukuks (bonds). During the last two decades, these products experienced a fast growth. This latter was followed by the emergence of several heterogeneous Islamic financial assets.

The main ethical principles in Islamic finance are shared by the entire Muslim community. However, we noticed the emergence of different schools of Islamic financial thoughts over the years. Each of them has its own interpretation and therefore its own standards of practical implementation. To overcome the problem of interpretation, each Islamic financial institution has a specialized committee, called Sharia board or Islamic Sharia Supervisory Committee.

Our present study differs from previous ones in several ways: First, while existing studies have only used the first moment and have neglected the relationship between volatility of Islamic and conventional indices (Charles et al., 2015; Al-Khazali et al., 2014; Albaity 2012; Nazeeruddin and Dawood, 2014), we examine in this paper volatility spillovers (second moment) between the two markets. To understand how shocks and volatility are transmitted between the two financial variables we use univariate and multivariate GARCH models. We have combined these methods to examine how volatility linkages have differed when Islamic assets were involved.

More interestingly, we have used the DCC-FIAPARCH model that took into account two important features of financial time series, namely asymmetry and long memory. To the best of our knowledge, ours is the first study that modeled jointly asymmetry and long memory in the conditional volatility of both Islamic and conventional indices. Second, using the estimation results of our appropriate FIAPARCH model, we build the optimal portfolio by computing the optimal weights of Islamic and conventional indices that investors should own in their portfolio in order to minimize risk without lowering their expected returns. Finally, we also seek to examine the effects of the subprime crisis on the conditional correlation between the two types of indices during the different phases of the subprime crisis. As mentioned in several previous studies (Lagoarde-Segot 2015; Rizvi et al., 2014; Mensi et al., 2015; Jawadi et al., 2014), this crisis has affected Islamic as well as conventional stock markets. Consequently, it was interesting to examine the behavior of the dynamic conditional correlation between the two markets during this crisis, which represented a good guide for investors' portfolio choices during the phases of the subprime crisis.

The remainder of the paper is structured as follows: Section 2 presents the empirical literature. Section 3 describes the methodology. The data and the preliminary analysis are displayed in Section 4. Section 5 discusses the empirical results of the univariate and multivariate GARCH models and their implications for portfolio's diversification. Section 6 concludes the study.

2. The literature review

The growing interest in the ethical alternative of Islamic investment products has led to a first wave of studies interested in the feasibility and particularities of the Islamic financial market (Elgari, 1993; Anwar, 1995; Ahmad, 1997; Naughton and Naughton, 2000). This first theoretical wave was followed by a second specialized wave on mutual funds. Another stream of research dealing with Islamic indices has emerged over the last decade, but is very limited in number and statistical depth.

Contrary to the abundant studies on conventional indices, studies on Islamic ones were minimal given the recent nature of these indices. Taking into consideration that the goal of any investor is to maximize returns for a given level of risk, most

[1] The Sharia is a gathering of defined standards drawn from different Islamic theological sources.

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