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# How strong are the causal relationships between Islamic stock markets and conventional financial systems? Evidence from linear and nonlinear tests



Ahdi Noomen Ajmi<sup>a</sup>, Shawkat Hammoudeh<sup>b,\*</sup>,  
Duc Khuong Nguyen<sup>c</sup>, Soodabeh Sarafrazi<sup>b</sup>

<sup>a</sup> College of Science and Humanities in Slayel, Salman bin Abdulaziz University, Saudi Arabia

<sup>b</sup> College of Business, Drexel University, Philadelphia, PA, United States

<sup>c</sup> IPAG Lab, IPAG Business School, France

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### ABSTRACT

Past studies suggest that the Islamic finance system is only weakly linked or even decoupled from conventional markets. If this statement is true, then this system may provide a cushion against potential losses resulting from probable future financial crises. In this article, we make use of heteroscedasticity-robust linear Granger causality and nonlinear Granger causality tests to examine the links between the Islamic and global conventional stock markets, and between the Islamic stock market and several global economic and financial shocks. Our findings reveal evidence of significant linear and nonlinear causality between the Islamic and conventional stock markets but more strongly from the Islamic stock market to the other markets. They also show potent causality between the Islamic stock market and financial and risk factors. This evidence leads to the rejection of the hypothesis of decoupling of the Islamic market from their conventional counterparts, thereby reduces the portfolio benefits from diversification with Sharia-based markets. A striking result shows a connection between the Islamic stock market and interest rates and interest-bearing securities, which is inconsistent with the Sharia rules. The results also suggest that modeling Islamic stock markets should be done within a nonlinear VAR system and not through a regression equation.

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\* Corresponding author. Tel.: +1 610 949 0133; fax: +1 215 895 6975.

E-mail addresses: [ajmi.ahdi.noomen@gmail.com](mailto:ajmi.ahdi.noomen@gmail.com) (A.N. Ajmi), [hammoum@drexel.edu](mailto:hammoum@drexel.edu) (S. Hammoudeh), [duc.nguyen@ipag.fr](mailto:duc.nguyen@ipag.fr) (D.K. Nguyen), [sarafrazi@gmail.com](mailto:sarafrazi@gmail.com) (S. Sarafrazi).

## 1. Introduction

One of the new innovations in the world's financial system is the creation of Islamic banks, and stock and bond markets which operate differently from their conventional counterparts. Assets in the Islamic industry have grown 500% in the last five years, reaching \$1.3 trillion in 2011. However, this phenomenal growth is still hindered by some structural factors. There is a lack of a secondary market, which prevents this sector from operating in important regions of the world. The market also requires much more short-dated products in order to enable Islamic banks to effectively manage their liquidity.

Islamic banks are asset-based and asset-driven because they are prohibited from dealing with interest. Islamic equity investments have Sharia-based screens that restrict investment in certain industries and favor growth and small cap stocks. By contrast, conventional banks are interest-based and debt-driven, and conventional stock markets prefer value and mid cap stocks, and do not have investment screens. It will thus be valuable to find out whether the Islamic stock market under consideration is integrated with conventional stock markets. It is also useful to figure out if this market is linked to several diverse global shocks which are pertinent to different asset classes and systems. These issues are of great interest to conventional and Islamic investors. Indeed, investors and managers of a Sharia-compliant Islamic equity fund often pick stocks from the Sharia compliant indices or focus on investing ethically in businesses which comply with the Sharia principles.

Given the recent financial crisis and the presence of nonlinearity among financial markets, we empirically employ both linear and nonlinear causality tests to investigate the interactions between the Islamic stock market and conventional finance systems. The Dow Jones Islamic Market Index (DJIM), which is a Sharia-based equity index, is used to represent the Islamic stock markets.<sup>1</sup> This index includes shares of companies whether located in Muslim or non-Muslim countries as long as they are Sharia-compliant (i.e., they have to pass a set of rules-based screens). Although it is a subset of the Dow Jones Global Index, the DJIM index provides approximately 95% market coverage of 44 countries. It also has an independent Sharia Supervisory Board and its screens have been adopted by the Auditing & Accounting Organization of Islamic Financial Institutions (“AAOIFI”)–Standard 21.<sup>2</sup>

The use of nonlinear causality tests is entirely justified by the fact that economic and financial time series tend to interact each other in a nonlinear fashion. This recognition has been enforced by the repeated occurrences of severe economic and financial crises and events including rare black swans like the 2007/2008 global financial crisis.<sup>3</sup> The potential nonlinearity in the dynamics of the variables of interest can manifest itself in the presence of, among others, regime switching, asymmetry, leverage effects, structural breaks, and heterogeneity of investors including speculators, particularly hedge funds, and long term investors. The mere existence of these stylized facts ultimately requires heteroscedasticity-robust (HR) procedures and nonlinear tests to examine their relationships. For example, if the error terms from a vector autoregressive (VAR) model are heteroscedastic, the conclusions of causality tests might not be robust under the assumption of constant variance (Hafner and Herwartz, 2009).

Therefore, we make use of several tests to examine causal relationships between the Islamic and conventional stock markets, and between the Islamic stock market and financial and economic factors. The tests include the heteroscedasticity consistent covariance matrix estimator (HCCME) proposed by MacKinnon and White (1985), the fixed design wild bootstrap procedure of Hafner and Herwartz (2009), and the nonparametric nonlinear Granger causality test of Hiemstra and Jones (1994).

Overall, the motivation for this research is twofold. First, the magnitude of asset price variations at speculative markets typically exhibits high degree of market interrelations, implying that the errors of

<sup>1</sup> Most of the published articles on Islamic finance use either DJIM or the FTSE Global Islamic Index, but the former is more comprehensive and more widely used than the latter. Our article also considers the DJIM index as a proxy for the global Islamic stock market because of its global coverage and use, and thus is part of a broader literature that focuses on the performance and behavior of restricted portfolios.

<sup>2</sup> There are companies in the Muslim countries that do not pass those rules, and thus cannot be included in the DJIM index. More details regarding the DJIM index are presented in Section 4.1. Note also that the research is abundant on Islamic banks but is at its infancy when it comes to the Islamic stock market.

<sup>3</sup> In addition to changes in the business cycle, these crises could have been facilitated by the continuous flows of complex financial innovations, announcements, regulations, globalization, etc.

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