Research in International Business and Finance 36 (2016) 222–240

Contents lists available at ScienceDirect

Research in International Business and Finance

journal homepage: www.elsevier.com/locate/ribaf

Full length Article

MENA stock market volatility persistence: Evidence before and after the financial crisis of 2008

Ata Assaf*

Faculty of Business and Management, University of Balamand, PO Box: 100, Tripoli, Lebanon

ARTICLE INFO

Article history:
Received 6 July 2015
Accepted 8 September 2015
Available online 10 September 2015

Keywords:
Long memory
MENA equity markets
Emerging markets
Weak-form market efficiency

JEL classification:
G14
G01
G15
C4/F3/G15

ABSTRACT

The global financial crisis began with a financial meltdown in the United States in early 2008 and then it had spread to the rest of the world. In this paper we test whether the MENA equity market volatility presents a different behavior before and after the financial crisis of 2008. Using long range dependence techniques we test for long memory in the returns, absolute and squared returns of the MENA equity markets. We subject the series to unit root tests that allow for structural breaks and use the Bai and Perron (1998, Econometrica, 66, 47; 2003a, J. Appl. Econometrics, 6, 72; 2003b, Econometrics J., 18, 1) to test for multiple breaks in the mean returns. The results indicate that the volatility measures represented by absolute and squared returns show evidence of long memory for the full and subsample periods, while the returns show a weak evidence of long memory. Considering the shift dates and corresponding to the 2008 financial crisis, the returns and volatility measures display less evidence of long memory in the after crisis period as opposed to the before crisis period. The change in the returns and volatility dynamics of these markets was due to financial and economic conditions that took place in the MENA region after the crisis.

1. Introduction

The efficient market, random walk model of stock prices requires that the arrival of new information be promptly arbitraged away. A necessary and sufficient condition for the existence of arbitrage price is that statistical dependence between distant observations of a price series must decrease very rapidly. If persistent statistical dependence is present, the arbitrage price changes do not follow the martingale process, which characterizes the efficient market, and should have an infinite variance. Therefore, the question of whether or not financial markets are efficient is directly related to whether or not long-term dependence is present in returns. The long memory, or long range dependence, property describes the high-order structure of a series. If a series exhibits long memory, there is persistent dependence even between distant observations. Such series are characterized by distinct but nonperiodic cyclical patterns. The presence of long memory dynamics causes nonlinear dependence in the moments of the distribution and hence a potentially predictable component in the series dynamics. Mandelbrot (1977) characterizes such processes as having fractal dimensions. On the other hand, the short memory, or short term dependence, property describes the low-order correlation structure of a series. For short memory series, correlations among observations at long lags become negligible. The presence of long memory structure in asset prices raises issues

* Corresponding author. Tel.: +961 6930250.
E-mail address: ata.assaf@balamand.edu.lb

http://dx.doi.org/10.1016/j.ribaf.2015.09.003
0275-5319/

regarding theoretical and econometric modeling of asset prices, statistical testing of pricing models, pricing of derivatives and tests of efficiency and rationality[1].

While there exists an extensive literature relating to both market efficiency and financial market crises, primary emphasis has been on emerging markets and the 1997 Asian crisis. Lesser attention has been paid to the numerous crises that have occurred after, like the financial crisis of 2008. Even less attention has been given to developed markets, where stock market and foreign exchange market crises also occur. This study investigates crisis period effects for the MENA equity markets, using as its base the 2008 financial market. The advantage of this period is that it allows the examination of the precrisis, crisis, and postcrisis periods.

We investigate the impact of the financial crisis of 2008 by using tests for long memory applied to the returns and volatility of the MENA equity markets. The focus on these markets is appropriate for a number of reasons. First, these countries are becoming an increasingly important component of the regional economy, with their equity market becoming an integral segment of the regional stock markets. Second, these markets allow comparison of developed markets with maturing markets to determine if the returns-generating processes and presence or absence of long-range dependence depends on the degree of market development. Third, the presence of long-memory dynamics in these markets would provide evidence against the weak form of market efficiency as it implies non-linear dependence in the moments of the distribution and hence a potentially predictable component in the series dynamics. Fourth, the presence of long memory in financial prices may reflect fractal dynamics in the underlying economy, which, in turn, would be of value in modeling business cycles. Fifth, as the volatility dynamic plays a very important role in derivative pricing, it may be beneficial to incorporate the long-term volatility structure in deriving pricing formulas (i.e., Bollerslev and Mikkelsen, 1996).

The MENA (Middle East and North Africa) region is part of these markets and offer those opportunities to investors. The importance of this region is that all MENA equity markets are open to foreign investor participation and also allow repatriation of dividends and capital. Apart from Jordan where foreign investors are restricted to certain sectors but allowed to own 99% of the tourism share capital, other markets like Egypt and Morocco have no restrictions on foreign investors[2]. Despite their openness, these markets remain somewhat unsophisticated and MENA's combined market capitalization remains small—both in comparison to other regions, and in proportion to its overall GDP.

Thus, the purpose of this study is to (1) understand the dynamics of equity markets in the MENA region through a series of long memory tests and then (2) investigate the role and impact of 2008 financial crisis on the dynamics of returns/volatility in these markets and its implications for market efficiency. Our results indicate a weak evidence of long memory in the returns series for all the periods considered (i.e., full and subsamples), while a strong evidence is proved in the volatility process for the whole sample period, while this long memory weakens after the crisis. A result that might be associated with changes in the informational efficiency of these markets in the after crisis period.

The paper is organized as follows. Section 2 provides an overview of the impact of the Global Financial Crisis of 2008 on the MENA region and some information about the financial and economic background of these markets. Section 3 presents a literature review. Section 4 provides an overview of the theoretical background and describes the tests employed. Section 5 presents the data and empirical results, including the regime shifts. Section 6 contains a summary of our findings and concluding remarks.

2. The MENA equity markets and financial crisis of 2008

2.1. Before the crisis

The underdevelopment of the region's stock markets is the result of several factors, not least of which is the fact that MENA still attracts a small proportion of the world's foreign direct investment (FDI). According to figures obtained from the Institute of International Finance, the Middle East and African attracted just US$10bn of foreign direct investment in 2001, compared with US$50.4bn for Latin American and almost US$70bn for Asia. The Middle East and African share represents just 6.7% of total equity investment inflows to emerging markets. A further drain on investor's confidence is the memory of recent stock market crashes that took place at the end of the last decade. For example, investors in Egypt were burned by their own stock market crash of 1997–1998, precipitated by the East Asian financial crisis and the subsequent emerging markets financial crisis. Nevertheless, as these countries launch their privatization programs with the government sell-offs, foreign investors will be more encouraged putting their money into MENA countries.

The comparative underdevelopment of MENA stock markets motivated many MENA exchanges in upgrading their trading infrastructure and systems. For example, Egypt revitalized its capital market by adopting a computer-based screen trading system, a circuit breaker and has one 4-h trading session. Starting in 2002, the Egyptian Stock Exchange expanded the price boundaries imposed on daily movements of listed shares which are accompanied by applying trading halt for a period of 30 min, 45 min or until the end of the trading session. In Jordan, at the start of year 2000, the Amman Stock Exchange (ASE)

[1] Long-term dependencies have been found in the returns of a variety of assets classes. For exchange rates see Cheung and Lai (1993, 1995), and for US and international equity markets, see Greene and Fielitz (1977), Lo (1991), Nawrocki (1995), Cheung et al. (1993) and Jacobsen (1996).

[2] For an overview of the equity markets in some Middle Eastern countries and issues related to market efficiency and organizational structure, look at Bekaert and Harvey (1995,1997), Errunza (1994), El Erian and Kumar (1995), Al-Loughani (1995) and Al-Loughani and Moosa (1997)