Risk and Return in Emerging Stock Market: An Applied Study on the Amman Stock Exchange

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Abstract

The study aimed to test the correlation between return and risk in Amman Stock Exchange (ASE) in order to determine the market's ability to compensate investors in the form of a risk premium. The study used the general index of stock prices at the ASE during the period 2/1/2008 to 31/12/2014. The study used Generalized Autoregressive Conditional Heteroscedasticity (GARCH), and found that there are positive and statistically significant relationship between return and risk in the ASE, Which means that the ASE is able to compensate investors at a risk premium by making them more cautious to market risk.

Keywords: Stock, return, GARCH, Amman Stock Exchange.

I. Introduction

The concept of return and risk is fundamental in the process of understanding and analysis of investment management, which is based on the principle of trade-off between risk and return, specifically, the positive relationship between the degree of risk and return. The investor requires higher returns consistent with an increased amount of risk; the greater the degree of risk an investor must bear, the higher the return must be for consistency between the two.

The stock market is a leading economic indicator which reflects the forthcoming economic situation in any given country. As a result of the global financial crisis, stock prices dramatically fell during the study period coupled with increased signs of future economic downturn. The financial sector was severely damaged and stock prices remained highly volatile. The fluctuation in stock prices affected Arab stock markets, which were already characterized by a high degree of volatility.

The US financial markets represent the leadership of the global financial markets. Thus any additional risk exposure to these markets tends to spread quickly to the rest of other world financial markets. The US markets’ crisis has led to a great deal of instability and volatility in global financial markets and induced extreme fear among investors prompting many of them to become extremely risk averse. Many investors started searching for safe investments in other sectors with returns far higher than what government securities were willing to offer.
According to modern portfolio theory, the market risks are associated with fluctuations in returns, and therefore, investors require higher returns during volatile periods. The return on investment that investors require and aspire to achieve are proportional to the risks associated with markets’ volatility and so the higher the volatility (variability of returns) the higher the required rate of return. Investor’s willingness to invest money in volatile markets depends to a great extent on their risk tolerance (Khryosh, et al, 1996). They always look for securities that would provide the highest return at an acceptable level of risk. Some investors are always hunting for undervalued securities in order to achieve a higher rate of return especially in inefficient markets. They refuse to take on additional risk unless there is an appropriate consequent increase in the expected rate of return (Al-hendi, 2002).

The principles of the investment portfolio theory addressed the two components of risk which markets or individual securities can be exposed to. Namely, unsystematic risk which according to the theory and to an extent in reality is diversifiable, and systematic risk which is not diversifiable and can affect all sectors of the market and the economy at variable degrees. To that extent, rational investors which the theory also advocates their existence must take into account the risks that they will be exposed to whenever they embark on an investment decision. The central point of consideration in this process is the positive correlation between risk and return where by any investment must yield a return consistent with the risk associated with any particular security or higher. (Khryosh et al., 1996). However, some studies have shown that there is a negative correlation between risk and return in some financial markets while other studies have shown that this relationship is not clear.

As a result of the global financial crisis and the associated fluctuations in returns, financial risks became a central issue in so far as the understanding of the correlation between return and risk and has become a basis of fair pricing as well as risk management. Financial markets became more aware of the changes introduced after the crisis and consequently implemented modified strategies relative to risk management especially in the field of pricing risk premium accurately.

This study is based on the above discussion and it aims to test the relationship between return and risk in ASE. The rest of the paper is organized as follows: Section II presents and overview of the literature on risk and returns; section III describes the data and the methodology used and Section IV discusses the empirical results while section V concludes the study and offers recommendations.

II. Literature Review
Several studies have pointed to the positive relationship between risk and return and that risks require a risk premium to compensate the investor. (Ghysels et al. 2005, Bollerslev et al. 1992). In contrast, other studies have shown that there is a negative relationship between return and risk (Brandt and Kang, 2004) while other studies have failed to reach a relationship between the two (Battilossi and Houpt, 2006), and this contradiction needs further search.

Many studies in emerging markets used GARCH model to determine the relationship between return and risk with varied results of these studies to the nature of the relationship. (Choudary, 1996) studied volatility and the risk premium in six emerging markets before and after the financial markets crisis which occurred in 1987 (Black Monday). He applied GARCH-M methodology using monthly returns of the Argentinian, Greek, Indian, Mexican, Thai, and Zimbabwe markets during the period 1976-1994. The results showed a change in the ARCH indicators and the fluctuation in the markets before and after the 1987 crisis as well as a lower risk premium appearance, but the volatility and risk premium were specific to each market individually and the reasons were not only confined to the markets crisis of 1987.

Another study by (Salman, 2002) aimed to reach a practical guide about the relationship between return and risk and trading volume in Istanbul Stock Exchange during the period 2/1/1992-29/5/1998 which also applied GARCH methodology whereby the study found that there is a positive relationship between returns and risks, and that changes in the volume of trading had a positive impact on returns.
(Al-Fayyoumi, 2003) studied the relationship between trading volume and volatility of stock prices in the Palestine Exchange, using weekly data for the Jerusalem index during the period 8/7/1997-28/9/2000, which applied the GARCH study methodology, and found difficulty of interpreting the fluctuating prices through the flow of information to the market.

(Ghysels et al., 2005) studied the relationship between return and risk in the US markets by using the prices of daily and monthly shares offered by the research center (CRSP) during the period 1928 to 2000. He used the deference methodologies ICAPM and GARCH and found a positive relationship between returns and risks as well as the reactions of the risks in return resulting from the positive and negative shocks. The researcher found that positive shocks had a bigger impact on return than negative shocks.

A study by (Shin, 2005) included 14 emerging markets in Latin America, Asia and Europe during the period 1989-2003, and by using the weekly data and the application model GARCH. The study found that there is a positive relationship between return and risk in most of the studied markets (10 of the 14 markets) but not significant in most of the cases (3 cases were only significant). This study also tested the impact of the emerging markets crisis in 1997 on revenue in the studied markets where the results showed that the financial crisis has produced a trace of the risk premium in the stock returns in emerging markets.

The study by (Battilossi and Houpt, 2006) used weekly data to test the relationship between risk and return and trading volume in Bilbao securities market during the period 1916-1926, where researchers used the GARCH methodology to find a relationship. The study showed that there are high volatility shocks, and evidence of the impact of weak trading volume in return, and in the opinion of the researchers, these results were consistent with the results of contemporary studies that used GARCH methodology in emerging markets.

At the level of the emerging markets, the study (2008, Khedhiri and Muhammad) aimed to predict risks in Abu Dhabi Securities market during the period 2001-2005, where the application of the typical EGARCH and TARCH were used in this study. The results reached that the models used able to better predict performance of market fluctuations in cases of low, medium and high, and indicated that the fluctuations in the market came as a result of the regulatory framework of the new changes through allowing foreign investors to participate in the market, and had accompanied the volatility in the market increase in stock prices in the same direction.

A study (Darwish, 2009) aimed to test the relationship between return and risks in Palestine stock market during the period 17/10/2000 to 16/8/2009 using GARCH model. The study concluded that there is a positive relationship between return and risk but not of statistical significance.

The Amman stock exchange was not immune from the study whereby several studies looked at the main components to explain the changes in the prices of traded shares in the Amman stock exchange which are divided into three aspects:

The first aspect addresses market efficiency and the constraints on the performance of the stock market, which received the largest share of studies that have reached different results and many reasons to explain the market inefficiency and the constraints faced such as the lack of information and the absence of market makers investment banks (Shamia & Talafha, 1990).

The second aspect addressed the organizational of the market and behavioral patterns and trends of the investors and its impact on the functioning of the market, where studies have shown that the market provides the appropriate climate to attract foreign investments which may assist in the transfer of knowledge and technology to many industries, and that the foreign investor tries to focus on productive investments in the developing countries, and transnational corporations which give priority to research and development projects and investment through financial markets considered as a substitute for direct investment of foreign capital (Gharaybeh & El-Khoury, 1994).

The third aspect is a study of the impact of economic data and financial reports on stock prices, and the results were mixed; stock prices either do not respond much to the declared accounting profits, or that some of the other variables had a larger impact on stock prices (Salameh, 1997), (Suwaidan & El-Khoury, 2000), (Erol & El-Bdour, 1990).
III. Data and Methodology
In order to determine the relationship between return and risk in the ASE, this study assumes a positive relationship between risk and return. We measure a relationship that can be described through the Generalized Autoregressive Conditional Heteroscedasticity or what is known as GARCH model instead of using measuring traditional CAPM model.

This study is based on a standard statistical methods, where the normal distribution test under Jarque - Bera test (JB), serial autocorrelation under Augmented Dickey - Fuller (ADF) to test the unit root, the instability of variance test heteroscedasticity using ARCH-LM test, and statistical multiplier; LaGrange Multiplier (LM).

The GARCH model was used because the results of the studies that have been on the market have shown that there is a deviation of the returns from the normal distribution and Leptokurtic in serial returns, as well as instability of variance (Alfayyoumi, 2003). Therefore, the GARCH model is appropriate for such data and is able to take the behavior of serial and determine the relationship between return and risk (Diebold, 1986).

To test the relationship between return and risk in ASE we used GARCH-M model which depends on the periods of lag (delay) the values of q and p through GARCH-M model(p:q), where these values have been identified through Schwarz (Bic) and Akaike (AIC) standards. The study used the closing daily prices in the ASE index for the period from 2/1/2008 to 31/12/2014 which include 1731 observations.

The daily returns $R_t$ were measured using the natural logarithm of the data according to the following equation:

$$R_t = \ln (P_t - P_{t-1})$$

Where:

$P_t$: is the closure of the price index of the Amman Stock Exchange today in time $t$.

IV. Empirical Results
It was found in Table (1) below, that the model, GARCH-M (1:1) is suitable for application in the ASE by using E-Views statistical program to get the results in this study.

Table (1) shows that the average return on the ASE index was (2.905) and the standard deviation (1.470). The results found the presence of skewness and Kurtosis in the distribution of return compared to the normal distribution, and therefore the hypothesis of returns series normal distribution using Jarque–Bera test at level 1% was rejected.

Unit root test results rejected the presence of unit root hypothesis in the index returns at the level 1%, and therefore, the index returns is stationary. This result is necessary to avoid getting false Spurious resulting from the use of unstable transactions. Furthermore, Table (1) above shows the presence of high fluctuation in return and thus a Heteroscedasticity by using ARCH-LM (7) test, and statistical LaGrange Multiplier (LM) at 7 lag periods where the LM was statistically significant at level 1%.

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Descriptive statistics results consist with the results of the studies that have been in emerging markets where the study by (Bekaert et, al.1998), which indicates to a positive Skewness in 17 out of the 20 emerging market, and positive leptokurtic in 19 markets among the 20 emerging markets, therefore, the distribution of returns is not normally distributed.
The results also show a high degree of volatility which is non-linear in return. According to a study by (Diebold, 1986), these characteristics indicate that the use of the methodology for lack of contrast variation unconditional serial connection or what is known as a GARCH model is appropriate for these cases, which can give better results for properties time series of daily returns.

Table (2) displays the results of GARCH-M (1:1) model, where the results show a proof of the high volatility in returns is statistically significant at 1%. If the summation of GARCH coefficient ($\mu + \beta$) is close to 1, this implies the continuity of volatility shocks in this market. And this supports the result of unit root test (ADF test). So, its respond to short-term (daily) shocks. By comparing the values of $\mu$ and $\beta$, the value of $\mu$ is less than the value $\beta$ as shown in table (2). This means that the effect of oldest information is less than the effect of newest information. So, the dealers and investors in ASE should take into consideration the newest information more than oldest information.

<table>
<thead>
<tr>
<th></th>
<th>$\mu$</th>
<th>$\beta$</th>
<th>$\mu + \beta$</th>
<th>$\partial$</th>
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<tr>
<td></td>
<td>0.100</td>
<td>0.882</td>
<td>0.982</td>
<td>1.171</td>
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<td></td>
<td>(1.633)</td>
<td>(11.741)*</td>
<td>(14.039)*</td>
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*Statistically significant at the level 1%.
- Z value in brackets

Depending on the results of Table (2), the effect of volatility on the index returns ($\partial$) is positive and statistically significant at a level of 1%. This means that the relationship between return and risk, and therefore the risk premium, were positive on the ASE and statistically significant. This means that the ASE generate a trace of risk premium by making investors more cautious to market risk and it also means that the ASEIs also affected by the dangers of the global financial crisis, and that the global financial crisis is responsible for the change in the price pattern in the market.

V. Conclusion and Recommendation

The study tested the relationship between return and risk in ASE, to determine the market’s ability to compensate investors for the risk premium after the occurrence of the global financial crisis.

The study used daily data from the ASE which is a market cap weighted index values during the period 1/2/2008 to 31/12/2014. By using the GARCH-M (1:1) model, the results show that there is a positive relationship between return and risk and are statistically significant and this means that the relationship between the return and the risks in the ASEIs strong which further means that the ASEIs affected by what is happening in the global markets.

Based on the study results, the researchers recommend the following:

1. Recognizing the link between what is happening in the global financial markets and that the ASE was affected by the global financial crisis as the study showed.
2. The need for a link and coordination between Arab financial markets in the exchange of experiences and information and financial reports and economic analyzes in order to strengthen its potential and to promote stability in the face of financial crises.
3. Show more transparency in information and financial reporting issued by companies listed on the ASE and that the various parties in the market serve to determine the level of risk that investors will accept.

References


