The Performance of Islamic and Conventional Egyptian Mutual Funds: A Comparative Study

By

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Abstract

This study evaluates overall monthly performances of 8 Islamic mutual funds (IMFs) in comparison with 24 conventional mutual funds (CMFs) for the period of January 2006 to December 2011 (96 months) divided into pre-financial crisis phase (27 months) and during financial crisis phase (45 months). The study aims at investigating the performance differences, if any, as well as determining factors affecting the performance of mutual funds. It employs Sharpe, Treynor and Jensen ratios as risk-adjusted performance measures. The paper concludes that the performance of IMFs is not significantly different from the CMFs counterparts in the pre-financial crisis phase or during the financial crisis phase. The study concluded that the performance of IMFs is not significantly different from the CMFs counterparts in the pre-financial crisis phase or during the financial crisis phase. Moreover, total risk and systematic risk significantly affect the performance of mutual funds. Income & Growth objective is an important variable that is accompanied with an increase in the performance of the fund. Growth objective and Age also play significant roles in interpreting the performance of mutual funds.

Keywords: Islamic mutual funds, performance evaluation, IMF and CMF.

1. INTRODUCTION & AIM OF WORK

Emergent knowledge of and demand for investing according to Shariah principles on a worldwide scale have been the motive behind making the Islamic financial services industry a prosperous industry. Furthermore, The Arab Spring revolutions in the Middle East and North Africa (MENA) region have not only affected the economies of region but also increased interest in Islamic-Economy oriented finance and investment (Shariah Compliant). This reflects the increase of investors' wealth and capacity, both Muslim and non-Muslim, to invest in new investment products that satisfy their own needs. Investment in Islamic Mutual Funds (IMFs) is becoming more popular in the modern market as a result of the global improvements of the Islamic finance (IF) that demonstrate IF becoming a significant sector of the international financial system. The demand for the Islamic fund products is increasing, with the industry currently considered to be the fastest growing niche of the Islamic

financial system. The IMFs' growth is essential, as it affects and explains indirectly the current advances of the global Islamic financial market place. (Mansor & Bhatti, 2011a).

1.1 Definition of Mutual funds

Investment companies and Investment funds are financial organizations that pool money from a large number of investors through the sale of Equity Shares (Metawa, 2001). The money pooled is invested in successful companies' stocks and bonds i.e., a portfolio of financial securities that serves investors of different scales as it achieves diversification.[1]

The market of Islamic mutual funds is a rapid growing segment within the Islamic financial system. However, in comparison with the mutual fund industry in general, Islamic mutual funds are deemed to be in their early phase of growth and development, with the majority being with inception dates of no more than a decade. Islamic funds are deemed to be diverse for an emerging industry.

The most significant characteristic which differentiates Islamic capital market from its conventional counterpart is that the first's activities does not contradict to the principles of Islam (Shariah), that is representing an affirmation of Islamic law in capital market transactions, the market place is free from forbidden practices, activities and elements such as riba (usury), gharar (ambiguity) (selling something that is not owned and/or that can't be accurately described; i.e., in terms of, size, type, and volume), maisir (gambling), zulm (exploitation) and rishwah (bribery), (Dewi & Ferdian, 2009). Islamic mutual funds are like "conventional" mutual funds in several aspects; but, unlike the "conventional" counterparts, Islamic mutual funds must comply with the Shariah (Islamic law) investment guidelines. Shariah encourages the application of partnership structures, profit sharing and prohibits Haram (non-Halal) transactions (El-Gamal 2000).

The Shariah principles and guidelines administer many facets of an Islamic mutual fund, including but not limited to its asset allocation (portfolio screening), trading and investment practices, and income distribution (purification). (Elfakhani et al., 2005a).

Fundamentally, Shariah-compliance IMFs vary operationally and conceptually from their conventional counterparts, although both funds have similar aim at satisfying their shareholders and realize above average returns. Compliance with Shariah necessitates the mutual funds' (MFs) activities to be

[1] This definition is the most common agreed upon by many scholars and also studies that have numerous alike definitions.

separated from firms involved in products or activities linked to conventional financial services, insurance or banking for prohibited activities such as gambling, non-halal food products and alcoholic beverages. Like CMFs, contributors to IMFs are considered shareholders and assume an equity position on the fund/securities. (Mansor & Bhatti, 2011b).

TABLE 1-1: THE MAIN DIFFERENCES BETWEEN CMFS AND IMFS

Features	CMFs	IMFs
The contract	It is also a commercial-based contract, according to the lender and borrower contract. The investor is a lender who lends the money in order to get a high rate of return and the dividend.	It is based on profit and loss sharing (PLS). Basically according to the Musharakah and Mudharabah principles. The Islamic financial system facilitates lending, borrowing and investments contracts based on risk-sharing basis or profit-loss sharing (Khan and Bhatti, 2008).
Shariah-compliant	It is not a legal requirement.	It is a legal requirement. The fund managers need to appoint the Shariah supervisory board.
Investments	Involved in all activities, which can provide above the required rate of return.	Involvement is limited to certain activities which comply with Shariah principles and Islamic jurisprudence. The activities should not involve short selling and harmful investments, gambling, alcoholic beverages, non-halal products, cigarettes, prostitution, drugs, weapons and pornography. It is also not involved in interest-bearing deposits and interest based banking and finance (Alhabshi, 1995; Bhatti 2009).
Return Objectives	Profit maximization is always the fund's objective without any restrictions.	Profit maximization is allowed but according to the Shariah principles and the Islamic jurisdiction.
Rate of Return	It is based on interest rate. It is predetermined and stated in the contract.	It is based on profit rate. In Islamic equity financing, profit cannot be predetermined, but the proportion of the profit can be predetermined based on the capital ratio.
Riba element	It is accepted under the legal requirement.	It is not allowed, according to Shariah law and a legal requirement. It is because riba rate is fixed and predetermined at the beginning of a contract.

*Compiled by the researcher

Numerous studies have proposed, examined and studied the factors affecting the performance of the mutual funds (either conventional, Islamic, ethical or other types). These factors include but not limited to: age of the fund (Blake & Morey, 2000), fund size (O'Neal & Page, 2000), fund objective (Volkman & Woher, 1995), systematic risk (Grinblatt & Titman**,** 1992) and (Fama & French, 1992), total risk (Sharpe, 1966), stock selectivity (Lintner, 1965), market timing (Mansor & Bhatti, 2011b), administrative fees (Khorana et al., 2009), time-series (Kendall & Hill, 1953) and fund managers (Ali, 2012). In this study the factors selected (the independent variables) are: fund age, fund size, fund objective, systematic risk and total risk being the most common and significant variables amongst the literature.

This study aims at evaluating overall monthly performances of 8 Islamic mutual funds (IMFs) in comparison with 24 conventional mutual funds (CMFs) for the period of January 2006 to December 2011 (96 months)

divided into pre-financial crisis phase (27 months) and during financial crisis phase (45 months). It employs Sharpe, Treynor and Jensen ratios as risk-adjusted performance measures.

2. Literature Review:

CAPM (the capital asset pricing model), is regarded to be the most notable theories in investment and financial economics. Separately developed by Sharpe (1964), Lintner (1965) and Mossin (1966), CAPM is known as a single-index asset pricing equilibrium model that has been significant since it is commonly used as a benchmark measuring the financial assets value and projects of capital budgeting along with evaluating the performance of fund managers'. The CAPM is primarily built on Markowitz's (1952) efficient frontier as well as the separation theorem of Tobin (1958).

However, Blume & Friend (1973) disapproved the use of CAPM as the pricing equilibrium for *all* forms of financial assets. Based on their analysis, they reached a conclusion that the CAPM is appropriate for the valuation of common stocks but not for the valuation of corporate bonds. (Elton *et al*., 1976) emphasized three key hurdles that obstruct the effective application of Markowitz's portfolio theory, from which the CAPM was derived, that are: the hardship in determining the form of input data required; the lengthy time and the enormous costs associated with the generation of an efficient portfolio; and the hardship of educating investors and portfolio managers on the relationship of risk and return represented in terms of standard deviations and covariances.

Using the CAPM, researchers were capable of formulating an absolute measurement value to assess mutual fund performance. *Treynor Index* (Treynor, 1965), the *Sharpe Index* (Sharpe, 1966), and the *Jensen-alpha Index* (Jensen, 1968), which were primarily derived from the formula of CAPM, are considered to be the three most broadly used risk-adjusted portfolio performance measures.

The CAPM has also been commonly employed as an instrument to distinguish the underperforming funds, portfolios or securities from their performing counterparts. The securities market line (SML), that is a graphical depiction of the CAPM, is a result of plotting the expected return against its beta coefficients which forms a linear regression line.

2-1. Review of Egyptian mutual fund studies

Several studies have been conducted to assess the performance of mutual funds in Egypt based on either time periods, valuation methods, or

different theories that interpret the investment decision related to mutual funds in qualitative and/or quantitative methods.

Attia (1995) studied the significance of mutual funds based on its role in attracting and directing investments, and focused on analyzing its performance from accounting and tax perspective applied to the Egyptian market. Khalifa (1997) focused on studying National Bank of Egypt (I, and II) mutual funds. The study concluded that mutual funds are able to achieve a good return to individual investors who have insufficient expertise to manage investments. The study focused on the ability of mutual funds utilizing proper diversification to minimize risks of market fluctuations, realize adequate profits during down periods, and maintaining investors' capital.

Al-taiby (1997) studied the mutual funds in Egypt based on the modern portfolio theory pioneered by Markovitz. The study recommended the increase of disclosure, transparency, information availability by preparation and disclosure of financial statements and monthly reports, and market diversification by adding new financial instruments and creating incentives to investment in them to neutralize additional risks imposed by them.

Moustafa (1998) analyzed the performance of mutual funds in Egypt focusing on the application perspective. The study measured the performance of a sample of mutual funds from 1995 to 1997. The result of the study was that the average risk adjusted rate of return of growth fund was higher than the average of the market. Mahmoud (1999) referred to the importance of highlighting the mutual funds' performance and its ability to achieve diversification and balance between risk and return which has a positive impact on attracting new investors to the mutual fund market. The study concluded that strong or weak performance of mutual funds shouldn't be attributed to fund managers only but also to the market as whole. Nevertheless one of the main reasons to revitalize trading in emerging markets is the size of transactions by big investors.

Hassan (1999) utilized Sharpe and Jensen models and the weekly rate of return for the mutual funds operating in Egypt along with estimating the weekly rate of return of the market index and comparing it to the weekly rate of return of mutual funds. The study proposed that Jensen model is the best model for mutual funds' performance measurement. The conclusion also claimed that the investment decisions of the fund managers affect the results of fund operations. The study claimed that mutual fund couldn't achieve higher returns in recession periods but achieved it in boom periods.

Elshamly (1999) focused on mutual fund general performance assessment using correlation coefficient between the mutual funds index performance and the general index of financial securities market as well as

studying correlation coefficient between mutual funds index performance and some sector indexes that are active in mutual funds market applied on financing sector and transformational industries. The study concluded that mutual funds that achieved above-average returns are characterized with higher risks.

Fathy (2000) concluded that mutual funds could be a substitute to investment companies because it serves small investors as it properly diversifies its portfolios. The study claims that mutual funds are able to vitalize financial securities market and create new investment perception. The study also projected that mutual funds industry will continue to flourish in the future and its effectiveness to increase in order help supporting the government economic reform program. On contrary Samak (2000) claimed that the performance of mutual funds during the year 2000 was weak based on risk-adjusted return methods and that is due to the small size of capital invested in mutual funds and the size of the Egyptian market. The study claims that the majority of mutual funds' goals and investment policies was deviated.

The study of Asran (2004) aim at determining the degree of total and systematic risk to open-ended and close-ended mutual funds in Egypt. And it concluded that close-ended mutual funds have less total risk degree than open-ended mutual funds under the fluctuating returns of the securities market in Egypt. The study of Nour Eldin (2007) aimed at identifying the significance of the role of the mutual funds in supporting securities market and affecting investment in financial instruments and its diversification. The study analyzed the performance of mutual funds in Egypt and its ability to direct the investments to securities market. It concluded that the majority of mutual funds in Egypt are non-specialized open-end mutual funds, and that using a proper quantitative statistical model helps determining the effect of mutual funds on the securities market in Egypt.

Ali (2012) compared between the performance of commercial and investment banks' mutual funds, and public banks' mutual funds in Egypt. The study illustrated the phenomenon of the outperformance of commercial and investment banks' mutual funds over public banks' mutual funds using Sharpe, Treynor, and Jensen Alpha models. The researcher continued to recommend the public banks to concentrate on stocks' funds, and appraised the performance of Hermes (Fund Manager). Furthermore the study recommended the fund manager to focus on growth funds.

It is observed that research and consultation centers specialized in money market overlook undertaking studies assessing and measuring the performance of mutual funds in Egypt generally and Islamic mutual funds specifically.

2-3 REVIEW OF ISLAMIC FUNDS:

Whether encouraged by the will to fulfil religious obligation for Muslims or merely a marketing scheme, Islamic finance has developed either as a possible complement or as a substitute to the conventional finance. The development of Islamic finance is, however, vital specifically to Muslim communities as the teachings of Islam are not only limited to the God and human-beings relationship but also embrace man's role as God's vicegerent in this world. The core of Islamic teachings is *Shariah* – meaning literally "a clear path to be followed and observed" – that is a derivation out of the two main sources which are the Holy *Quran* and the *Sunnah* (the Prophet Muhammad's words and deeds). Notwithstanding, *Shariah* guidelines are a derivation from other two independent sources which are the *ijma* (consensus) and the *ijtihad/qiyas* (individual reasoning by analogy) of the *ulama* (Muslim scholars). These subjective and diverse references made *Shariah* rulings dynamic and capable of further adaptation, interpretation and development in order to comprise the perpetually fluctuating circumstances Hourani (2004).

Fundamentally, Islamic finance is a financial system whose central aim is allegedly "to realize the teaching of the Holy *Quran* not only gaining maximum returns on financial assets'' as in Conventional finance Zaher & Hassan (2001). There are three elements differentiating between Islamic and conventional finance viz.: (1) the strict ban of *riba* (interest) in all and every financial transaction irrespective of the of applied interest rate percentage (Presley & Sessions, 1994); (2) the PLS concept (profit and loss sharing) as the justified mean for return distribution (Hourani, 2004); and (3) the prohibition on *gharrar* (speculation or uncertainty) activities (Usmani, 2005). Thus, the financing types favored by Islamic finance are the ones supported by tangible assets unlike debt-based instruments normally utilized in conventional finance.

Islamic finance, based on Shariah, is a mean to realize the *Maqasid AlShariah,* literally stands for the objectives/purposes of the *Shariah* Auda (2008) or the vision of Islam Chapra (2000). Al-Ghazali (1853), prominent Islamic scholar, defined *Maqasid al-Shariah* as ''The aim of the *Shariah* is to endorse the well-being of *all* mankind that lies in preservation their faith (*din*), their human self (*nafs*), their intellect (*aql*), their posterity (*nasl*), and their wealth (*mal*).''

Hence, minimizing hurdles and the ease and comfort of the life of all mankind are midst the central goals of *Shariah*. By presenting the moral values, it aids to balance between social and individual interest, hence leading

to the well-being and socio-economic justice of all God's creatures (Chapra, 2000).

Usmani (2005) defines Islamic investment funds as joint pools in which the investors invest their money in-excess to earn *halal* (permitted) profits in conforming strictly to the rulings of *Shariah*. Therefore, Islamic funds are investments specialized only in *halal* securities or *Shariah*-compliant while the operations carried out are strictly complying to the percepts of *Shariah* encompassing the ban of interest and any *haram* (prohibited) or *gharrar* (uncertainty or speculative) investments or activities.

Regarding the contract between fund managers and investors, *Shariah* describes an investor of Islamic funds as the *rab-ul-mal* (provider of the capital) in the contract whereas the fund managers could either be agents to the investor or the *mudarib* (entrepreneurs). In the first case, the fund managers as *mudarib* would be entitled to specific amount of earnings at a pre-specified rate as a compensation for their efforts in fund management, wherein the Islamic fund management is based on the concept of *mudarabah* (profit-sharing) (Shah, 2008). Thus, the fund managers act on behalf of and as agents to investors of Islamic funds and are paid a lump-sum amount of management fees as compensation for the services rendered. In the second though, the fund managers' earnings would be variable depending on the fund performance, as a reflection of their performance, as the compensation is measured on the basis of the total return of the fund (Mian, 2008). The fee is fixed at a rate agreed upon by both parties and computed on the basis of the fund's net asset value (NAV). Thus, in contrary with the first type of contract, wherein, the management fee does not depend on the Islamic fund performance, the Islamic funds' profits are distributed on the basis of the profit-and-loss sharing concept between investors and the fund managers (Ayub, 2007).

Functionally, regardless of the *Shariah* guidelines that Islamic funds must adhere to, the funds are not significantly different from conventional funds. The subsequent section illustrates the features of an Islamic fund that differentiate it from its conventional counterpart.

2-4 THE CHARACTERISTICS AND TYPES OF ISLAMIC FUNDS:

The unique feature of Islamic funds is the strict adherence to the Islamic *Shariah* principles as discussed earlier. Hussein & Omran (2005), based on *Shariah* restrictions, described Islamic investment as "low-debt, non-financial, social-ethical investments". Two basic conditions for Islamic funds outlined by Usmani (2002), first of all, Islamic fund returns should be derived from profit actually gained by the fund and its distribution must be on the basis of pro-rata (proportionate) and the application of PLS principle.

Secondly, each of the aspects of Islamic funds' operation must be done in accordance with the *Shariah* percepts. This includes not only investment in securities *that are halal*-approved or *Shariah*-compliant, but also the investment terms and conditions -agreed upon between all parties associated/involved in the Islamic funds- and also fund management must comply with the *Shariah* principles.

In spite of the similarities between Islamic and ethical funds[2], the two funds are dissimilar on two grounds in particular: the screening methods and the purification of income. The screening process of Islamic funds was defined by Zaher & Hassan (2001) as: *The practice of inclusion or exclusion of publicly traded securities from investment mutual funds or portfolios based on the religious and ethical precepts of the Islamic Shariah.*

Mian (2008) proposed that there are two screening methods employed by the *Shariah* advisory board so as to make a decision on companies' admissibility status; specifically, business activity screening and financial ratio screening. The business activity screening is done to determine whether the company screened is not engaged in any activities forbidden by *Shariah*. Nevertheless, as it is practically impossible to find a company/institution that is purely *Shariah*-compliant, Islamic scholars have agreed on approving any company with 95% of its revenues are derivatives of *halal* activities. Thus, the remaining 5% of the company's revenues may come from non-*halal* sources considered inevitable as a result of current business practices such as interest-based earnings from conventional financing activities and banking.

Secondly, financial ratio screening is executed to ensure that the financial aspect of the firm screened conforms to the *Shariah* requirements concerning leverage, interest income and receivables. For any firm to be *halal* approved, its total debt obtained from conventional financing must not surpass 33% of the firm's equity, its account receivables shall not exceed 49% of the total assets whereas interest income derived from cash and other interest bearing instruments shall not exceed 5% of the total profit (Mohamad & Nasir, 1995).

Income purification is another aspect that distinguishes Islamic funds from ethical funds. Due to the practical impossibility to find a company that is 100% *Shariah*-compliant, Islamic scholars have agreed to approve investing in a company that fulfils the minimum prerequisites imposed by both the business activity and the financial ratio screening. Therefore, this

[2] Ethical funds: those funds that adhere to ethical standards of investment. They have ethical screening which basically filters the funds' investments to ensure the ethicality of the investments made, in terms of the businesses and its industries, based on certain pre-determined ethical screening criteria or socially responsible investment policies.

mixture of *halal* and non-*halal* sources of income paved the rationale for income purification. Income purification was defined by Elgari (2002) as "deduction from the returns on investment of earnings whose source is not acceptable from a *Shariah* perspective". Briefly, the process of purification comprises a deduction of a specified amount of earnings or dividend payment which supposedly representing the non-*halal* income portion and giving it away to charity.

Shah (2008) asserted that the key reason behind Islamic funds' creation is "to attract investors whose investment decisions are based on the guidelines of the Islamic *Shariah*". Maurer (2001) proposed that the remarkable growth of Islamic funds is accredited to the contemporary interest towards ethical investments that "do not invest in unethical practices and industries". His view, which is referenced to the *Shariah* prohibition of derivatives trading comprising futures and options contracts that were mainly blamed for economic crises and business scandals, is shared by Hussein & Omran (2005) who claimed that the approach of Islamic investment has a unique advantage in its capability of detecting and removing troubled companies as presented by the withdrawals of Enron, Tyco and WorldCom from Dow Jones Islamic Market Index list and the consequent sale of these fims' shares by Islamic fund managers long before the downfall of these companies attributable to several scandals associated with unethical corporate practices. This exceptional ability empowers Islamic funds to better safeguard their investors' interest and increase its attractiveness to investors.

Even though the industry of Islamic funds is deemed to be relatively infant as compared to the more mature industry of conventional funds, Islamic funds have succeeded in gaining a significant market share in the fund management industry as a result of the availability of numerous Islamic fund products to satisfy the varied needs of the investors. Usmani (2007) states six types of Islamic funds, viz. equity funds, commodity funds, *bai-al-dain* (sale-of-debt) funds, *ijarah* (leasing) funds, *murabahah* (cost-plus) funds, and mixed funds. The nature and activities of each type of Islamic funds are fundamentally similar to their conventional peers except for the strict adherence to Shariah guidelines is a prerequisite to Islamic funds.

2-5 Questioning the Limited Development in the Islamic Funds' Performance Valuation

Unfortunately, the remarkable growth of the industry of Islamic funds globally is not reinforced by parallel academic research in this field. As a result of the lack of alternative models of fund performance valuation, studies have no other option but to employ the traditional models of portfolio valuation in their analysis of the performance of Islamic funds and this does

not help the long-term development of the contemporary industry of IMFs. Lydenberg (2007) claimed that one reason to this limited development is the prevalence of the modern portfolio theory as well as the hardship of assessing or compensating non-financial motivations further decreases interest towards forming an alternative exclusive Islamic funds' portfolio valuation model. The second reason is the limited intellectual appetite or capacity particularly among Muslim academic scholars in addition to Islamic finance and banking (IBF) practitioners, as well as the maturity of the industry in Muslim communities as proposed by Maurer (2001).

3. Research Methodology

3-1 Data collection

The study depended on the performance reports and documents to gather the necessary data required for the study (secondary data). Monthly data, performance reports, and financial statements disclosed by mutual funds operating in the Egyptian financial market were used. Egyptian Investment Management Association (EIMA) reports, Egypt for Information Dissemination (EGID) reports, www.showmethefunds.com, and Egyptian Stock Exchange reports were used during the exploratory research.

The study covered eight consecutive years (96 months) starting from January 2006 to December 2011. The study was divided into pre-financial crisis phase (27 months) and during financial crisis phase (45 months). The researcher has taken into consideration the length of the time line of the research sample and entering all Islamic mutual funds in comparison to similar Conventional mutual funds (Open-End equity mutual funds) for the purpose of standardization in order for the comparison to be relevant and meaningful.

The second period of the study –during F.C. period- was extended to include the period of the January 2011 Egyptian revolution that severely affected the Egyptian economy and accordingly the performance of mutual funds.

3-2. Research Population & Sample

The research population has been determined from the local mutual funds operating in the Egyptian financial market since initial inception of the first Islamic mutual fund in December 2004- the start of the research Time. The number of operating mutual funds in Egypt in 2004 was 24 including only one Islamic mutual fund. By the end of 2013 there were 78 mutual funds operating in Egypt including 9 Islamic mutual funds.

The study sample includes all the Islamic mutual funds – 8 IMF-(open-end, equity funds) operating in the Egyptian market and their Conventional

counterparts-24 CMF (open-end, equity funds) working in Egypt till December 2011 (end of the study).

3-3. Study variables:

The study -according to the theoretical frame of study- defined the independent variables that can affect the performance of mutual funds. The dependent and independent variables are discussed as follows;

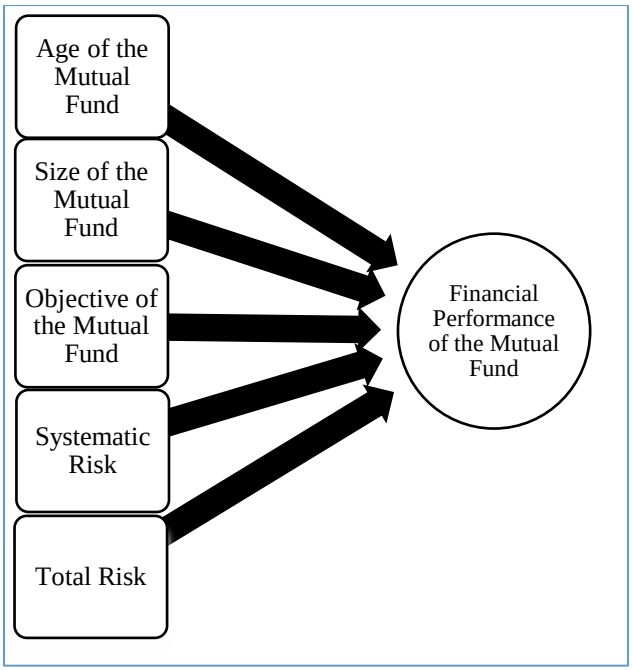

Figure 3-1: Proposed Model illustrating the relationship between the Variables

3-3-1. Dependent variable:

The dependent variable is the financial performance of the mutual fund itself measured by the realized returns of every mutual fund of the sample, measured by Sharpe, Treynor, and Jensen models (to be thoroughly discussed later).

3-3-2 Independent variables:

The independent variables are:

(1) **Age of mutual fund.** Carhart (1997) and Blake & Morey (2000).

(2) **Size of the mutual fund.** O'Neal & Page (2000), Grinblatt & Titman (1994) and Carhart (1997).

(3) **Objective of mutual fund.** Volkman & Woher (1995)

(4) **Systematic risk**. Grinblatt & Titman (1992), Fama & French (1992) and Miller (2001).

(5) **Total risk.** Standard Deviation. Sharpe (1966).

4. Study Methodology

4-1. Statistical analysis:

To determine the direction and the degree of significance of the factors affecting the performance of mutual funds under study -Independent Variables- on the performance of mutual funds -Dependent variable- the researcher used:

4-1-1. Simple Correlation:

To determine and measure the power of correlation between the dependent and independent variables.

4-1-2. Multiple regression analysis:

To determine investment risks that has effect on the financial performance of the mutual funds. It is defined as the quantitative expression of the nature of the relationship between independent and dependent variables. It reveals the change in the dependent variable value that results from a change of the independent variables. Also **stepwise regression** to determine the effect of the independent variables on the dependent variable for every mutual fund and estimating the significance of the relationship.

SPSS v.21 was used to statistically analyze the data.

4-2. Assessment of the research variables:

Independent Variables:

4-2-1. The Age of the Fund:

The age of the fund as an independent variable have been measured on a monthly basis since the inception date of the fund till the end of the study period which is the same method applied by Carhart (1997) and Blake & Morey (2000) who calculated the age of the fund –either weekly or monthly or quarterly- based on the past period since inception and the end of the study period. Age variable is reflected in the maturity and accumulated experience of the fund managers and the availability and forecast-ability of the fund's trend practically rather than theoretically.

4-2-2. The Size of the Fund:

$$NAV = \frac{Total\ Amount\ of\ Assets\ of\ The\ MF\ for\ a\ specified\ period\ of\ time}{\#\ of\ shares\ or\ bonds\ of\ the\ fund\ during\ the\ same\ period}$$

The size of the fund is calculated as the Net Asset Value (NAV) that is relevant to each mutual fund during the period of the study based on the measurement method of Grinblatt & Titman (1994), Carhart (1997) and O'Neal & Page (2000).

4-2-3. The Objective of the fund:

The objective of the mutual funds vary between 1- growth, 2- income and 3- income and growth. Volkman & Woher (1995) proposed that the difference between these three objectives could be expressed as one of the factors that may illustrate and/or affect the performance of the mutual funds.

4-2-4. Systematic Risk:

Systematic risk was measured as an independent variable that may illustrate and/or affect the performance of the mutual funds which is measured by Beta coefficient. Beta coefficient – as a measure of systematic risk- can be calculated by dividing the variance between the fund return and market portfolio[3] return by the variance of market portfolio return during the period of the study. This variable was proposed by Grinblatt & Titman (1992), Fama & French (1992) and Miller (2001).

$$B_i = \frac{Cov\ (X_i, X_m)}{\delta_m^2}$$

$$= \frac{\sum_{t=1}^{n}(X_{it} - \bar{X}_i)(X_{mt} - \bar{X}_m)}{\sum_{t=1}^{n}(X_{mt} - \bar{X}_m)_m^2}$$

Where:

B_i**:** Beta Coefficient for mutual fund i.

$Cov\ (X_i, X_m)$**:** Variance between mutual fund (i) return, and market portfolio (m) return.

δ_m^2**:** Variance of market portfolio m.

[3] Market portfolio used in the study is the index of Egyptian Stock Market (EGX30), launched on 1 February 2003, which includes the most active stocks in the Egyptian money market. The index includes top 30 companies in terms of Liquidity and Activity. The index is weighted by the market capitalization and adjusted by free float. EGX30 avoids concentration on one industry and therefore has a good representation of various industries/sectors in the economy.

$\boldsymbol{X_{it}}$**:** Return of mutual fund i at period t.

$\boldsymbol{\bar{X}_i}$**:** Average (Mean) of return of mutual fund i during the specified period.

$\boldsymbol{X_{mt}}$**:** Return of market portfolio at period t.

$\boldsymbol{\bar{X}_m}$**:** Average (Mean) of market portfolio during the specified period.

n: Number of periods included in the study

4-2-5. Total Risk:

Total risk as an independent variable was measured with standard deviation of the returns of the mutual fund under study, using the mutual funds' monthly return data to calculate the standard deviation on monthly basis by calculating the square route of the square of mutual funds' returns variations from its mean over number of returns. Sharpe (1966) claimed that standard deviation as a measure of total risk could have a significant effect on the performance of the mutual funds.

$$\boldsymbol{S = \sqrt{\frac{1}{n-1}\sum_{t=1}^{n}(R_t - \bar{R})^2}}$$

Where,

S = Standard deviation of the mutual fund (total risk)

n = Number of monthly returns.

R_t = Monthly returns of the mutual fund.

$\bar{R}$ = Average return of the mutual fund.

CoV: coefficient of variation represents the total risk assumed by the mutual funds as per unit of return achieved

$$\boldsymbol{Coefficient\ of\ Variation = \frac{S}{\bar{R}}}$$

Where,

S = Standard deviation of the mutual fund (the total risk).

$\bar{R}$= Mean return of the mutual fund.

4-3. Measuring the Dependent Variable:

The financial performance of mutual funds is calculated in the study as follows:

4-3-1. Non Risk-Adjusted Returns Methodology:

The mutual fund's return of is computed as capital gain plus income (dividends)

$$R_{i,t=} = \frac{NAV_{i,t} - NAV_{i,t-1} + D_{i,t}}{NAV_{i,t-1}}$$

R i,t : Total return of an individual fund (i) at month(t).

NAV i, t : Net Asset Value of fund (i) at month (t).

NAV i, t − 1 : Net Asset Value of fund (i) at month (t-1).

D i, t : Cash disbursements or Dividends for fund (i) at month (t).

For the purposes of comparison two portfolios were formed, based on time (pre or during the financial crisis phase) or category (Islamic or conventional) or both, using the following formula:

$$R_{p,t} = \sum_{i=1}^{n_t} \frac{R_{i,t}}{n,t}$$

R p, t : Return at month (t) for the portfolio (p: Islamic or conventional).

R i, t : Total return at month (t) of an individual fund (i) that belongs under either: the Conventional category if p=conventional or Islamic category if p=Islamic.

n, t : The number of individual funds under each category (conventional or Islamic) at month (t).

Cumulative return, maximum return, minimum returns, average return, standard deviation, variance, mean, covariance, correlation, beta, R2, skewness, kurtosis, and coefficient of variation are calculated for each fund/portfolio.

4-3-2. **Risk-Adjusted Returns Methodology**

The researcher used risk-adjusted performance and risk measures for the conventional and the Islamic fund portfolios. The absolute risk adjusted performance measures: (1) Sharpe Ratio (2) Treynor Ratio (3) Jensen differential Alpha were applied to measure mutual funds' risk-adjusted performance. To analyze the risk of the portfolio of each fund, the study employs the market risk (beta), coefficient of variation (CV), and the standard deviation.

A. **The Sharpe Model**

William F. Sharpe commenced working on portfolio theory as thesis project in 1960. He developed the concept of risk free asset. The combination of the Markowitz efficient portfolio with the risk free asset enabled him to introduce the capital market line as the efficient portfolio line. Utilizing the Sharpe model, made it possible to determine a risky asset's expected rate of return for, that in turn paved the way to develop capital asset pricing model CAPM. An investor, through the use of this model, is capable of knowing what the risky securities/assets required rate of return should be. For asset valuation, the required rate of return is very significant, through matching its discounted cash flows with the required rate of return. (Sharpe 1966).

So as to determine the portfolios that offer the most favorable risk/return trade-off, we divide the historical excess returns ratio by the fund/portfolio return's standard deviation. The portfolio that offers the greatest reward/risk ratio would be the risky portfolio that investors would decide to invest in. Sharpe ratio measures the ex-post portfolio performance via the mean returns of the portfolio.

Sharpe presented the reward to variability ratio (aka Sharpe ratio) as follows:

$$\textbf{Sharpe Ratio} = \frac{R_P - R_f}{\delta_P}$$

$\mathbf{R_P}$ = the observed mean fund return;

$\mathbf{R_f}$ = the mean risk free return;

$\boldsymbol{\delta_P}$ = the standard deviation of fund returns.

Sharpe model is utilized to the measurement the performance of a portfolio in terms of return per unit of risk. Moreover, Sharpe ratio measures the ability of the fund/portfolio manager based on the performance of the rate of return and diversification degree in view of the portfolio's total risk.

B. The Treynor Model

Treynor distinguished between two forms of risks. The first is Systematic risk that is associated with market and cannot be diversified away. Nevertheless, this form of risk could by computed by "beta". Treynor claims that the expected return of a portfolio is dependent on its beta. The second form of risk that he distinguished from systematic risk is called unsystematic risk. Unsystematic risk is the specific risk of a company defined as the uncertainty associated with the company which could be diversified away. This model is employed for the measurement of the performance of a portfolio with regard to return per unit of risk (systemic risk). The mutual fund that provides higher return per unit of risk (systemic risk) will be favored when compared to funds with lower return per unit of risk. Beta is used by Treynor ratio as a risk measure therefore reflects the Systematic risk. The portfolio manager's capability is measured by Treynor ratio also based on the performance of the rate of return and the diversification degree by accounting for the portfolio's systemic risk. The historical portfolio performance is also measured by Treynor ratio by the return per unit of risk (systemic risk). (Treynor, 1965).

$$\textbf{Treynor Ratio} = \frac{R_P - R_f}{\beta_P}$$

$\mathbf{R_P}$ = the observed mean fund return;

$\mathbf{R_f}$ = the average risk free return;

$\boldsymbol{\beta_P}$= Beta coefficient as a measure of systematic risk / mean portfolio (p).

Treynor Ratio provides an indication that investors would prefer to invest in the portfolios with the greatest reward/risk (systemic risk) ratio. Assuming that the manager of the fund/portfolio has diversified away unsystematic risk/company specific risk (the diversifiable risk), the investor should be should only be concerned about the systematic risk (non-diversifiable/market risk), instead of total risk.

C. The Jensen's Alpha Model

Jensen's alpha measures returns in excess, if there are, below (or above) the fund risk-adjusted return as projected from a CAPM perspective. A negative (positive) alpha infers that the fund/portfolio is under-performing (outperforming) its benchmark market premium, whereas a (statistical) zero alpha reflects the normality of the portfolio performance is as projected in CAPM. The following regression model represents Jensen's alpha:

$$(R_P - R_f) = \alpha + \beta_P (R_M - R_f)$$

R_P = the observed mean fund return;

R_f = the mean risk free return: T-bill rate of return;

β_P = coefficient as a measure of systematic risk / average portfolio beta.

α = the abnormal return of a portfolio

R_M= the mean return of the market: EGX 30

This index measures also the investment manager's capacity to increase the funds' return above the market's return by the optimization of an active strategy. In other words, this index can measure the ability of the mutual fund to "beat the market". Furthermore, any mutual fund with a consistency of positive excess returns (risk adjusted) will have a positive alpha, vice versa. Jensen differential measure is primarily used for the calculation of the abnormal (excess) fund/portfolio's return which is the difference between the actual mean return realized by a fund/portfolio and the return that should have been realized by the portfolio taking into account the conditions of the market and the portfolio's risk. (Jensen, 1968).

Even though these risk and performance measures are commonly used in the literature of mutual funds, this study is unique since it employs these models on all Egyptian Islamic mutual funds in order to give insights on these funds' risk-return profile, performance and dissimilarities, if any, between IMFs and CMFs.

5. Data analysis, results discussion and Recommendations

5-1. Data analysis:

The first step that was implemented by the study to analyze the data was the financial analysis using Microsoft Excel 2013 as follows:

- Calculation of the returns of each fund
- Dividing the data timeline into various-portfolios- sets (Pre-financial crisis, during the financial crisis, Islamic and conventional funds) in order to compare the result of these sets among each other and to the market benchmark (EGX30 and T-Bill rates).
- Calculating the Sharpe Ratio, Treynor Ratio and Jensen Alpha for each fund and for each portfolio (set).

- Calculation of the standard deviation, mean, median, minimum, maximum, Skewness[4], Kurtosis[5], R^2 (R-square), Beta, Covariance, Correlation and the Coefficient of Variation of the returns of all the funds and the portfolios (sets).

The second step was to statistically analyze the financial outcomes using SPSS v.21 in the following order:

- Stepwise multiple regression of the three ratios namely; Sharpe Ratio, Treynor Ratio and Jensen Alpha in order to recognize which variables significantly contribute to explaining the dependent variable which is the performance.
- T-test[6] to test the difference between the means of the sets in order to recognize the differences between the sets if any.
- Correlation coefficient between dependent and independent variables is afterwards used to test the significance of the correlation.

5-2. Hypotheses tests:

H_1: There is no significant difference between Islamic and Conventional mutual funds' financial performance in the Pre-Financial Crisis phase.

Table (5-1) illustrates a comparison between the values of the independent variables of Islamic and conventional mutual funds in the pre-financial crisis phase and shows if there are significant differences between the two sets. The t-test Table (5-1) shows there is statistically significant difference between both portfolios as the p-values are 2.67E-07 and 0.008 with the t-stat of 8.2 and 3.1 for age and size respectively, which indicate that there is statistically significant difference between the returns performance of the Islamic and Conventional mutual funds in the pre financial crisis phase. However, the result shows the mean age and size of Conventional MFs are higher than the Islamic MFs accompanied with a higher standard deviation in both variables.

Table (5-2) shows a performance comparison between Islamic and conventional mutual funds based on Sharpe, Treynor and Jensen ratios. The results in table (5-2) suggests that there is no significant statistical difference between the performance of conventional and Islamic mutual fund in the pre-financial crisis phase based on the risk adjusted measures of financial

[4] Skewness: is the measure of symmetry or dissymmetry of the normal distribution of a data set (the more symmetrical the data set is, the closer the skewness is to 0).
[5] Kurtosis: is a measure of the peakedness or the flatness of the normal distribution of a data set (the higher the peak is, the higher the kurtosis is).
[6] Unequal variance, two-tailed T-tests were employed.

performance. The means and standard deviations of the two set are quite the same.

Table (5-1) Descriptive statistics & T-test of Independent Variables of Islamic Mutual Funds Pre. Financial Crisis vs Conventional Mutual Funds Pre Financial Crisis

Independent Variables	IMFs Pre F.C.		CMFs Pre F.C.		Test results		
	Mean	StD	Mean	StD	t	Sig.	Significant[7]
Age	1.637	1.025	10.302	3.441	8.184	2.67E-07	yes
Size	140.29	24.986	309.07	211.13	3.086	0.00803	yes
Systematic risk	0.3603	0.2040	0.5079	0.1237	1.513	0.18090	no
Total risk	0.0335	0.0196	0.0560	0.0118	2.395	0.05363	no

*Source: researcher's analysis by SPSS outputs

Table (5-2) Descriptive Statistics & T-test of Dependent Variables of Islamic Mutual Funds Pre. Financial Crisis vs Conventional Mutual Funds Pre Financial Crisis

Performance measures	IMFs Pre F.C.		CMFs Pre F.C.		Test results		
	Mean	StD	Mean	StD	T	Sig.	Significant[8]
Sharpe	2.3897	4.334	0.2653	0.063	1.095	0.323	no
Treynor	0.0649	0.238	0.0299	0.008	0.889	0.414	no
Jensen	0.0058	0.005	0.0049	0.003	0.358	0.730	no

*Source: researcher's analysis by SPSS outputs

Tables (5-1) and (5-2) show the statistical insignificance of the difference between the majority of the variables at a significance level of 5%. The results tend to be logical taking into consideration that the non-risk adjusted comparison showed a statistically significant difference whereas the risk adjusted measures showed the statistical insignificance of the difference. Moreover, for the purpose of standardization the two sets are listed under equity funds category, which eliminates the possible difference that may occur based on different categories.

It is worth mentioning that, IMFs insignificantly outperforms CMFs in the pre FC phase according to the risk adjusted measures.

[7] Significant at 5% significance level.
[8] Significant at 5% significance level.

Therefore, H_1 is accepted, meaning that there is no significant difference between Islamic and Conventional mutual funds' financial performance in the Pre-Financial Crisis phase.

H_2: There is no correlation between: Size, age, objective, systematic risk, and total risk of the mutual funds, and the mutual funds' financial performance.

Table (5-3) Correlation coefficients- Conventional Mutual Funds whole period

Independent variables	Sharpe Ratio	Treynor Ratio	Jensen Alpha
Age	-.114	-.063	-.124
Size	-.003	.066	.072
Objective (Growth)	-.220	-.241	-.233
Objective (Income)	.315	.323	.389
Objective (Income & Growth)	-.063	-.046	-.125
Systematic Risk	-.101	-.013	-.116
Total Risk	-.338	-.285	-.299

*Source: researcher's analysis by SPSS outputs

Table (5-4) Correlation coefficients- IMFs whole period

Independent variables	Sharpe Ratio	Treynor Ratio	Jensen Alpha
Age	-.564	-.482	-.020
Size	.037	.015	.303
Objective (Growth)	-.307	-.318	-.906
Objective (Income)	.072	-.164	.301
Objective (Income & Growth)	.325	.421	.473
Systematic Risk	-.352	-.187	-.107
Total Risk	-.262	-.129	-.338

*Source: researcher's analysis by SPSS outputs

To test this hypothesis correlation coefficients between the independent and dependent variables were used. Table (5-3) shows these correlation coefficients. Table (5-3) shows weak to medium positive correlations between the dependent and the independent variables. The majority of the correlations is negative because it includes the period of the revolution and the financial crisis that affected the cumulative performance of the mutual funds.

Systematic risk and Total risk are strongly positive correlated with Sharpe, Treynor and Jensen as shown in Table (5-4). Objective and the three dependent measures have medium-weak correlations (mostly negative). There is a strong positive correlation between age and Treynor and Jensen ratios, yet medium positive correlation with Sharpe ratio.

Table (5-5) shows that Systematic Risk is strongly positive correlated with Treynor and Jensen raitos, yet exhibits medium positive correlation with Sharpe ratio. Positive correlation between Total risk and Sharpe, Treynor and Jensen is strong, weak and medium respectively. Age and Size have medium positive correlation with the three ratios. Objective and the three dependent measures have weak correlations (mostly negative).

Table (5-5) Correlation coefficients of all MFs: whole period

Independent variables	Sharpe Ratio	Treynor Ratio	Jensen Alpha
Age	-.087	-.044	-.032
Size	.043	.092	.144
Objective (Growth)	-.178	-.201	-.285
Objective (Income)	.224	.223	-.337
Objective (Income & Growth)	-.022	.005	-.014
Systematic Risk	-.111	-.019	-.067
Total Risk	-.290	-.232	-.259

*Source: researcher's analysis by SPSS outputs

Therefore, H_2 is rejected, and the alternative hypothesis is accepted meaning that: There is a correlation between: Size, age, objective, systematic risk, and total risk of the mutual funds, and the mutual funds' financial performance.

H_3: Size, age, objective, systematic risk, and total risk of the mutual funds significantly affect mutual funds' financial performance in the Pre-Financial Crisis phase.

To identify the independent variables that have a significant effect on the dependent variables (the financial performance measures), stepwise regression analysis was employed at a significance level of 5%.

Table (5-6) shows that the results of the regression of Sharpe ratio are Systematic risk and total risk being the most significant independent variables[9] that affect Sharpe ratio (the dependent variable) and these independent variables explain 46.6% of the changes that occur to Sharpe ratio.

[9] based on the order they were entered to the model

Moreover, there are positive relationships between Sharpe ratio from a side and systematic risk and total risk from the other side.

The regression of Treynor ratio shows that systematic and total risk are the most significant independent variables[10] that affect Treynor ratio (the dependent variable) and these independent variables explain 62.1% of the changes that occur to Treynor ratio. The relationships between systematic and total risk and Treynor ratio are positive.

The regression of Jensen alpha ratio showed that Systematic risk, age and income & growth objective are the most significant independent variables[11] that affect Jensen alpha ratio (the dependent variable) and these independent variables explain 86.1% of the changes that occur to Jensen alpha ratio. Positive relationships exist between Jensen alpha and systematic risk, age and income & growth objective.

Table (5-6) Stepwise regression of all Mutual Funds Pre. Financial Crisis

Dependent Variables	**R^2**	**F (sig.)**	**Independent Variables**	**Estimates**		
				B	**t**	**Sig.**
Sharpe Ratio	.466	15.725 (.001)	Constant		4.423	.000
			Systematic Risk	.683	3.965	.001
			Total Risk	.309	2.416	.000
Treynor Ratio	.621	11.285 (.003)	Constant		-3.14	.006
			Systematic Risk	.621	3.359	.003
			Total Risk	.333	2.484	.000
Jensen Alpha	.861	41.441 (.000)	Constant		-1.66	.113
			Systematic risk	.551	6.039	.000
			Age	.519	5.817	.000
			In. & Gr. Obj.	.186	2.186	.041

*Source: researcher's analysis by SPSS outputs

Table (5-7) shows that the results of the regression of Sharpe ratio is Systematic risk being the most significant independent variable[12] that affects Sharpe ratio (the dependent variable) and this independent variable explain 71.9% of the changes that occur to Sharpe ratio. Moreover, there is a positive relationship between systematic risk and Sharpe ratio.

[10] based on the order they were entered to the model
[11] based on the order they were entered to the model
[12] based on the order they were entered to the model

Table (5-7) Stepwise regression of Islamic Mutual Funds Pre Financial Crisis

Dependent Variables	R^2	F (sig.)	Independent Variables	Estimates		
				β	t	Sig.
Sharpe Ratio	.719	10.229 (.033)	Constant		3.808	.019
			Systematic Risk	.848	3.198	.033
Treynor[13] Ratio	.697	25.130 (.002)	Constant		-9.370	.000
			Systematic Risk	.512	5.013	.002
Jensen Alpha[14]	.653	10.465 (.032)	Constant		.728	.507
			Systematic Risk	.751	3.235	.032

*Source: researcher's analysis by SPSS outputs

The regression of Treynor ratio shows that systematic risk is the most significant independent variable[15] that affects Treynor ratio (the dependent variable) and this independent variable explain 67.9% of the changes that occur to Treynor ratio. The relationship between systematic risk and Treynor ratio is positive.

The regression of Jensen alpha ratio showed that systematic risk is the most significant independent variable[16] that affects Jensen alpha ratio (the dependent variable) and this independent variable explains 65.3% of the changes that occur to Jensen alpha ratio. A Positive relationship exists between Jensen alpha and systematic risk.

Table (5-8) shows that the result of the regression of Sharpe ratio is total risk being the most significant independent variable[17] that affects Sharpe ratio (the dependent variable) and this independent variable explains 63.6% of the changes that occur to Sharpe ratio. Moreover, a positive relationship exists between Sharpe ratio and total risk.

The regression of Treynor ratio shows that systematic risk is the most significant independent variable[18] that affects Treynor ratio (the dependent

[13] This data was forecasted based on the trend of the time series in order to be sufficient for the multiple regression analysis. (Original data was 6 sets, only two more sets were forecasted, and then regression analysis was employed based on the rule of the minimum of number of variables +1).

[14] This data was forecasted based on the trend of the time series in order to be sufficient for the multiple regression analysis. (Original data was 6 sets, only two more sets were forecasted, and then regression analysis was employed based on the rule of the minimum of number of variables +1).

[15] based on the order they were entered to the model

[16] based on the order they were entered to the model

[17] based on the order they were entered to the model

[18] based on the order they were entered to the model

variable) and this independent variable explains 65.7% of the changes that occur to Treynor ratio. The relationship between age, total risk and Treynor ratio is positive.

Table (5-8) Stepwise regression of Conventional Mutual Funds Pre. Financial Crisis

Dependent Variables	R^2	F (sig.)	Independent Variables	Estimates		
				β	t	Sig.
Sharpe Ratio	.636	27.958 (.000)	Constant		8.053	.000
			Total Risk	.798	5.288	.000
Treynor Ratio	.657	30.612 (.000)	Constant		8.813	.000
			Systematic Risk	.810	5.533	.000
Jensen Alpha	.816	48.399 (.000)	Constant		1.549	.142
			Systematic Risk	.623	6.174	.000
			Age	.506	5.014	.000

*Source: researcher's analysis by SPSS outputs

The regression of Jensen alpha ratio showed that systematic risk and age are the most significant independent variables[19] that affect Jensen alpha ratio (the dependent variable) and these independent variables explain 81.6% of the changes that occur to Jensen alpha ratio. Positive relationships exist between Jensen alpha and total risk and age.

H_3: rejected, and the alternative hypothesis is accepted meaning that: size, age, objective, systematic risk, and total risk of the mutual funds significantly affect the mutual funds' financial performance in the Pre-Financial Crisis phase.

H_4: There is no significant difference between Islamic and Conventional mutual funds' financial performance During-Financial Crisis phase.

Table (5-9) illustrates a comparison between the values of the independent variables of Islamic and conventional mutual funds during-financial crisis phase and shows if there are significant differences between the two sets. The t-test Table (5-9) shows there is statistically significant difference between both portfolios as the p-value is 0.00039 with the t-stat of 3.1 for age, which indicates that there is statistically significant difference between the returns performance of the Islamic and Conventional mutual fund during-financial crisis phase. However, the result shows the mean age of

[19] based on the order they were entered to the model

Conventional MF is higher than Islamic MF accompanied with a higher standard deviation.

Table (5-9) Descriptive statistics & T-test of Independent Variables of Islamic Mutual Funds during. Financial Crisis vs Conventional Mutual Funds during Financial Crisis

Independent Variables	IMFs During F.C.		CMFs During F.C.		Test results		
	Mean	StD	Mean	StD	t	Sig.	Significant
Age	4.272	2.134	9.151	6.417	3.1229	0.003	yes
Size	52.78	24.59	83.01	60.29	1.9335	0.063	no
Systematic risk	0.514	0.222	0.568	0.185	0.5792	0.575	no
Total risk	0.056	0.025	0.063	0.018	0.6926	0.506	no

*Source: researcher's analysis by SPSS outputs

Table (5-10) Descriptive statistics & T-test of Dependent Variables of Islamic Mutual Funds during Financial Crisis vs Conventional Mutual Funds during Financial Crisis

Performance measures	IMFs During F.C.		CMFs During F.C.		Test results		
	Mean	StD	Mean	StD	t	Sig.	Significant
Sharpe	-1.145	1.842	-0.450	0.2122	0.996	0.352	No
Treynor	-0.119	0.191	-0.062	0.069	0.781	0.457	No
Jensen	-0.0086	0.004	-0.0091	0.0068	0.208	0.836	No

*Sources: researcher's analysis by SPSS outputs

Table (5-10) shows a performance comparison between Islamic and conventional mutual funds based on Sharpe, Treynor and Jensen ratios

The results in table (5-10) suggest that there is no statistically significant difference between the performance of conventional and Islamic mutual fund during-financial crisis phase based on the risk adjusted measures of financial performance. The means of the two set are quite the same.

Tables (5-9) and (5-10) show the statistical insignificance of the difference between the majority of the variables at a significance level of 5%. The results tend to be logical taking into consideration that the non-risk adjusted comparison showed a statistically significant difference whereas the

[20] Significant at 5% significance level.
[21] Significant at 5% significance level.

risk adjusted measures showed the statistical insignificance of the difference. The three measures have shown negative signs which reflect the drastic fall in the performance of the MFs during the financial crisis period. Moreover, for the purpose of standardization the two sets are listed under equity funds category, which eliminates the possible difference that may occur based on different categories.

It is worth mentioning that, IMFs insignificantly outperforms CMFs during the FC phase according to the risk adjusted measures.

Therefore, H_4 is accepted, meaning that there is no significant difference between Islamic and Conventional mutual funds' financial performance during-Financial Crisis phase.

H_5: Size, age, objective, systematic risk, and total risk of the mutual funds significantly affect mutual funds' financial performance During-Financial Crisis phase.

To identify the independent variables that have a significant effect on the dependent variables (the financial performance measures), stepwise regression analysis was employed at a significance level of 5%.

Table (5-11) shows that the result of the regression of Sharpe ratio is total risk being the most significant independent variable[22] that affects Sharpe ratio (the dependent variable) and this independent variable explains 38% of the changes that occur to Sharpe ratio. Moreover, there is a positive relationship between Sharpe ratio and total risk.

The regression of Treynor ratio shows that systematic risk and size are the most significant independent variables[23] that affect Treynor ratio (the dependent variable) and these independent variables explain 60.4% of the changes that occur to Treynor ratio. The relationships between systematic risk and size and Treynor ratio are positive.

The regression of Jensen alpha ratio showed that systematic risk, age and income & growth objective are the most significant independent variables[24] that affect Jensen alpha ratio (the dependent variable) and these independent variables explain 86.1% of the changes that occur to Jensen alpha ratio. Positive relationships exist between Jensen alpha and systematic risk, age and income & growth objective.

[22] based on the order they were entered to the model
[23] based on the order they were entered to the model
[24] based on the order they were entered to the model

Table (5-11) Stepwise regression of all Mutual Funds During-Financial Crisis

Dependent Variables	R^2	F (sig.)	Independent Variables	Estimates		
				B	t	Sig.
Sharpe Ratio	.380	18.412 (.000)	Constant		-5.47	.000
			Total Risk	.617	4.291	.000
Treynor Ratio	.604	22.160 (.000)	Constant		-7.29	.000
			Systematic Risk	.818	6.654	.000
			Size	-.28	2.288	.003
Jensen Alpha	.861	41.441 (.000)	Constant		-1.66	.113
			Systematic Risk	.551	6.039	.000
			Age	.519	5.817	.000
			In. & Gr. Obj.	.186	2.186	.041

*Sources: researcher's analysis by SPSS outputs

Table (5-12) Stepwise regression of Islamic Mutual Funds During-Financial Crisis

Dependent Variables	R^2	F (sig.)	Independent Variables	Estimates		
				β	T	Sig.
Sharpe Ratio[25]	.745	17.510 (.006)	Constant		-5.03	.002
			Systematic Risk	.863	4.184	.006
Treynor[26] **Ratio**	.734	16.560 (.007)	Constant		-4.91	.003
			Systematic Risk	.857	4.069	.007
Jensen Alpha	.693	10.465 (.032)	Constant		-.728	.507
			Systematic Risk	.751	3.235	.032

*Source: researcher's analysis by SPSS outputs.

Table (5-12) shows that the result of the regression of Sharpe ratio is Systematic risk being the most significant independent variable[27] that affects Sharpe ratio (the dependent variable) and this independent variable explains

[25] This data was forecasted based on the trend of the time series in order to be sufficient for the multiple regression analysis. (Original data was 6 sets, only two more sets were forecasted, and then regression analysis was employed based on the rule of the minimum of number of variables +1).

[26] This data was forecasted based on the trend of the time series in order to be sufficient for the multiple regression analysis. (Original data was 6 sets, only two more sets were forecasted, and then regression analysis was employed based on the rule of the minimum of number of variables +1

[27] based on the order they were entered to the model

74.5% of the changes that occur to Sharpe ratio. Moreover, there is a positive relationship between systematic risk and Sharpe ratio.

The regression of Treynor ratio shows that systematic risk is the most significant independent variable[28] that affects Treynor ratio (the dependent variable) and these independent variables explain 73.4% of the changes that occur to Treynor ratio. The relationship between systematic risk and Treynor ratio is positive.

The regression of Jensen alpha ratio showed that systematic risk is the most significant independent variable[29] that affects Jensen alpha ratio (the dependent variable) and this independent variable explains 69.3% of the changes that occur to Jensen alpha ratio. Positive relationships exist between Jensen alpha and systematic risk.

Table (5-13) shows that the results of the regression of Sharpe ratio is Systematic risk being the most significant independent variable[30] that affects Sharpe ratio (the dependent variable) and this independent variable explains 50.2% of the changes that occur to Sharpe ratio. Moreover, there is a positive relationship between systematic risk and Sharpe ratio.

Table (5-13) Stepwise regression of Conventional Mutual Funds During. Financial Crisis

Dependent Variables	**R^2**	**F (sig.)**	**Independent Variables**	**Estimates**		
				B	**t**	**Sig.**
Sharpe Ratio	.502	22.146 (.000)	Constant		-8.84	.000
			Systematic Risk	.708	4.706	.000
Treynor Ratio	.513	23.179 (.000)	Constant		-6.44	.000
			Systematic Risk	.716	4.814	.000
Jensen Alpha	.685	48.399 (.000)	Constant		-1.54	.142
			Systematic Risk	.623	6.174	.000
			Age	.506	5.014	.000

*Source: researcher's analysis by SPSS outputs

The regression of Treynor ratio shows that systematic risk is the most significant independent variable[31] that affects Treynor ratio (the dependent variable) and this independent variable explains 51.3% of the changes that

[28] based on the order they were entered to the model
[29] based on the order they were entered to the model
[30] based on the order they were entered to the model
[31] based on the order they were entered to the model

occur to Treynor ratio. The relationship between systematic risk and Treynor ratio is positive.

The regression of Jensen alpha ratio showed that systematic risk and age are the most significant independent variables[32] that affect Jensen alpha ratio (the dependent variable) and these independent variables explain 68.5% of the changes that occur to Jensen alpha ratio. Positive relationships exist between Jensen alpha and systematic risk and age.

H_5: rejected, and the alternative hypothesis is accepted meaning that: size, age, objective, systematic risk, and total risk of the mutual funds significantly affect mutual funds' financial performance in the Pre-Financial Crisis phase.

H_6: Size, age, objective, systematic risk, and total risk of the mutual funds significantly affect Islamic mutual funds' financial performance.

To identify the independent variables that have a significant effect on the dependent variables (the financial performance measures), stepwise regression analysis was employed at a significance level of 5%.

Table (5-14) shows that the result of the regression of Sharpe ratio are total risk and income & growth objective being the most significant independent variables[33] that affect Sharpe ratio (the dependent variable) and these independent variables explain 55.3% of the changes that occur to Sharpe ratio. Moreover, there are positive relationships between Sharpe ratio and total risk and income & growth objective.

The regression of Treynor ratio showed that systematic risk is the most significant independent variable[34] that affects Treynor ratio (the dependent variable) and this independent variable explains 50.9% of the changes that occur to Tryenor ratio. The relationship between systematic risk and Treynor ratio is positive.

The regression of Jensen alpha ratio showed that systematic risk and growth objective are the most significant independent variables[35] that affect Jensen alpha ratio (the dependent variable) and these independent variable explain 82.2% of the changes that occur to Jensen alpha ratio. Positive relationships exist between Jensen alpha and Systematic risk and growth objective.

[32] based on the order they were entered to the model
[33] based on the order they were entered to the model
[34] based on the order they were entered to the model
[35] based on the order they were entered to the model

Table (5-14) Stepwise regression of Islamic Mutual Funds: whole period

Dependent Variables	R^2	F (sig.)	Independent Variables	Estimates		
				B	T	Sig.
Sharpe Ratio	.553	8.658 (.022)	Constant		.310	.006
			Total Risk	-.644	2.942	.022
			In. & Gr. Obj.	. 306	3.657	.003
Treynor Ratio	.509	7.264 (.031)	Constant		.051	.001
			Systematic Risk	-.714	2.695	.031
Jensen Alpha	.822	32.216 (.001)	Constant		4.136	.006
			Systematic risk	-.623	11.408	.000
			Growth Obj.	.306	5.676	.001

*Source: researcher's analysis by SPSS results

H_6: rejected, and the alternative hypothesis is accepted meaning that size, age, objective, systematic risk, and total risk of the mutual funds significantly affect Islamic mutual funds' financial performance.

H_9: Size, age, objective, systematic risk, and total risk of the mutual funds significantly affect Conventional mutual funds' financial performance.

Table (5-20) shows that the results of the regression of Sharpe ratio is total risk being the most significant independent variable[36] that affects Sharpe ratio (the dependent variable) and this independent variable explains 52.7% of the changes that occur to Sharpe ratio. Moreover, there is a negative relationship between Sharpe ratio and systematic risk.

Table (5-20) Stepwise regression of Conventional Mutual Funds: whole period

Dependent Variables	R^2	F (sig.)	Independent Variables	Estimates		
				β	t	Sig.
Sharpe Ratio	.527	11.157 (.003)	Constant		2.261	.034
			Total Risk	-.572	-3.340	.003
Treynor Ratio	.436	17.796 (.000)	Constant		3.371	.003
			Systematic Risk	-.660	-4.219	.000
Jensen Alpha	.883	173.184 (.000)	Constant		2.812	.010
			Systematic Risk	-.940	13.160	.000

*Source: researcher's analysis by SPSS outputs

The regression of Treynor ratio showed that systematic risk is the most significant independent variable[37] that affects Treynor ratio (the dependent variable) and this independent variable explains 43.6% of the changes that

[36] based on the order they were entered to the model
[37] based on the order they were entered to the model

occur to Tryenor ratio. The relationship between Treynor ratio and systematic risk is negative.

The regression of Jensen alpha ratio showed that systematic risk is the most significant independent variable[38] that affects Jensen alpha ratio (the dependent variable) and this independent variable explains 88.3% of the changes that occur to Jensen alpha ratio. Positive relationship exist between Jensen alpha and Systematic risk.

H_9: rejected, and the alternative hypothesis is accepted meaning that: size, age, objective, systematic risk, and total risk of the mutual funds significantly affect Conventional mutual funds' financial performance.

Overall, the research findings are comprehensive and accomplish the objectives of this thesis (see Section 1.3, in Chapter 1), and capable of answering the research questions (see end of Section 1.2, in Chapter 1) pertaining to the hypotheses of the thesis that have been developed. The key conclusions of this thesis based on the researcher's analysis are discussed in the following section.

6. Summary of Conclusions and Recommendations:

6-1. Conclusions:

- One of the most important conclusions that the study arrived at is that total risk and systematic contribute in interpreting the performance of the mutual funds which goes along with the study of (Ali, 2012).
- The study concluded that the Income & Growth objective is an important factor affecting/illustrating the performance of the mutual funds, which is a logical conclusion that agrees with the investment literature that pinpoints Income & Growth objective is always accompanied with an increase in the performance of the mutual fund. This conclusion conforms to (Volkman & Voher, 1995).
- Growth objective is also an important factor affecting/illustrating the performance of the mutual funds, which is a logical conclusion that agrees with the investment literature that pinpoints growth objective is accompanied with an increase in the performance of the mutual fund. This conclusion conforms to (Gallagher, 2002).
- Age plays a significant role in interpreting the performance of mutual funds –which conforms to Blake & Morey (2000) - as it is positively correlated with Sharpe, Treynor and Jensen measures in the pre F.C. phase. This result seems logical as the mutual fund industry-specially Islamic mutual funds-was relatively new, and as the industry matures age doesn't cease to play

[38] based on the order they were entered to the model

this significant role in affecting and/or illustrating the mutual fund performance.

- There is no significant difference between the performance of conventional funds and Islamic fund in the pre F.C. phase and during the F.C. phase in the Egyptian market. However, there is an insignificant difference in favor of the IMFs, since IMFs slightly outperforms CMFs in the pre F.C. phase and during the F.C. phase in the Egyptian market.
- Islamic mutual funds' performance has not only levelled the conventional mutual funds' performance but also had the same trend and evenly affected by the economic/political fluctuations and instability as shown in the market graphical depiction in the appendices.
- The Egyptian mutual funds have suffered severely during the peak global financial crisis period (the last three quarters of 2008). The mutual fund performance began to recover after a series of economic reforms/aid (undertaken by the governments) designated to help overcome the global financial crisis consequences that affected the global markets. A drastic fall in the performance of the Egyptian mutual funds followed then during the first quarter of 2009 because of the second wave of the consequences of the global financial crisis, whilst he second quarter of 2009 witnessed a promising recovery. The political unrest in Egypt during 2010 and the political speculations has also affected the performance of the mutual funds before a sharp rise in the performance in January 2011. As of January 2011 the performance of the mutual funds witnessed a drastic fall followed by up and down fluctuations during first three quarters of 2011. The last quarter of 2011 has witnessed a downfall in the performance of the mutual funds because of the speculations on the first parliamentary elections after the revolution.
- Mutual funds are characterized by high market sensitivity as they are directly and significantly affected by the market/economy situation, thus can be considered as a market mirror.
- Islamic funds are exposed to several return-affecting Shariah-compliance requirements that may not directly affect the conventional counterparts' performance. Furthermore, Islamic mutual funds don't have an appropriate benchmark that properly accounts for the Shariah-compliance factors that probably affect the performance of Islamic mutual funds by limiting their ability to invest in certain industries that maybe of a higher return.
- During the research, it was observed that Islamic and conventional mutual fund in Egypt have many similarities in terms of structure and operations and both are managed by the same fund managers. The main distinguishing factor is that Islamic funds are bounded by the investment in Shariah-compliant industries.

6-2. Limitations of the research:

- The employment of T-bill rate as the risk-free rate is not relevant to Islamic mutual funds as an alternative investment since it includes ‘’*riba*’’.
- The timeline of the study was limited since Islamic mutual funds are quite contemporary to the Egyptian market, which might affect the significance of the results.
- For the purpose of the comparison to be relevant, the performance of conventional equity funds was compared with the performance of Islamic equity funds.
- The findings were constrained by the small number of Islamic mutual funds that might has an effect on the significance of the results.

6-3. Recommendations:

Based on the research and its conclusions, the researcher recommends the following:

- Focusing on the income & growth objective mutual funds could result in better performance of the funds and thus, greater return.
- Focusing investments on Islamic Mutual Funds may result in a return per unit of risk ratio that is relatively higher than the conventional counterparts taking into consideration that IMFs show the trend of outperforming CMFs despite the difference being yet insignificant, as well as satisfying other qualitative needs such as, the religious needs and/or the diversification needs.
- The development of an Islamic benchmark –based on ‘’*murabaha*’’ for instance- to better compare Islamic mutual funds to since the current benchmark includes ‘’*riba*’’.

6-4. Future studies:

- Entering new variables to the multiple regression model in order to better interpret the change in the performance of the mutual funds.
- Quantifying the variables related to Shariah compliance to be able to quantify the effect of each variable- if any- on the performance of Islamic mutual funds.
- Widening of the scope of analysis through the study of the behavioral, qualitative and quantitative factors affecting the performance of mutual funds and/or the investment decision in one category over another.
- Developing a new valuation model that would be able to account for the Shariah-compliance factor.
- Analysis of the effect of the January 2011 revolution on the performance of Egyptian mutual funds.

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