A COMPARATIVE STUDY ON MUTUAL FUND PERFORMANCES OF EMERGING MARKETS IN THE ERA OF QUANTITATIVE EASING

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A COMPARATIVE STUDY ON MUTUAL FUND PERFORMANCES OF EMERGING MARKETS IN THE ERA OF QUANTITATIVE EASING

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Ömer Faruk Tan

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DECLARATION OF ORIGINALITY

I, Ömer Faruk Tan, certify that

- I am the sole author of this thesis and that I have fully acknowledged and documented in my thesis all sources of ideas and words, including digital resources, which have been produced or published by another person or institution;
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ABSTRACT

MUTUAL FUND PERFORMANCES OF EMERGING MARKETS IN THE ERA OF QUANTITATIVE EASING

This study aims to analyze six emerging markets' equity funds – Turkey, Poland, Taiwan, South Africa, India and Mexico – during the period between January 2009 and October 2014. After the global financial crisis of 2008 came a period of quantitative easing (QE), creating an increase in the money supply and leading to a capital flow from developed countries to developing countries. The stock markets of these selected emerging countries increased dramatically during the era of quantitative easing. In this work, a total of 73 equity funds (11 Turkish Equity Funds, 14 Polish Equity Funds, 15 Taiwanese Equity Funds, 10 South African Equity Funds, 12 Indian Equity Funds, 11 Mexican Equity Funds) are analyzed in order to compare these funds' performances within this period. In order to measure these funds' performances, the Sharpe ratio (1966), Treynor ratio (1965), Jensen's alpha (1968), Sortino ratio (1994) and M^2 ratio (1996) methods are used. Jensen's alpha is also used in identifying selectivity skills of fund managers. Furthermore, the Treynor & Mazuy (1966) and Henriksson & Merton (1981) regression analysis methods are applied to ascertain the market timing ability of fund managers.

ÖZET

PARASAL GENİŞLEME DÖNEMİNDE GELİŞMEKTE OLAN ÜLKELERİN YATIRIM FONLARI PERFORMANS ANALİZİ

Bu çalışma altı tane gelişmekte olan ülkenin – Türkiye, Polonya, Tayvan, Güney Afrika, Hindistan ve Meksika- hisse senedi yatırım fonlarını Ocak 2009- Ekim 2014 arası dönemde analiz etmeyi amaçlamaktadır. 2008 küresel krizinden sonra, parasal genişleme politikası ile beraber para arzının arttığını ve gelişmiş ülkelerden gelişmekte olan ülkelere doğru bir sermaye akışı olduğu gözlemlenmiştir. Seçilen gelişmekte olan ülke borsaları parasal genişleme döneminde çarpıcı bir şekilde büyümüştür. Bu doğrultuda, toplam 73 tane hisse senedi fonu (11 tane Türk hisse senedi fonu, 14 tane Polonya hisse senedi fonu, 15 tane Tayvan hisse senedi fonu, 10 tane Güney Afrika hisse senedi fonu, 12 tane Hindistan hisse senedi fonu ve 11 tane Meksika hisse senedi fonu) performansı parasal genişleme döneminde karşılaştırmalı olarak analiz edilmiştir. Bu fonların performanslarını ölçmek için, Sharpe rasyosu (1966), Treynor rasyosu (1965), Jensen alpha (1968), Sortino rasyosu (1994) ve M^2 rasyosu (1996) kullanılmıştır. Jensen's alpha ile ayrıca yöneticilerin seçicilik kabiliyeti araştırılmıştır. Buna ek olarak, yöneticilerin zamanlama yeteneğini ölçmek için Treynor & Mazuy (1966) ve Henriksson & Merton (1981) regresyon analizi yöntemleri kullanılmıştır.

ACKNOWLEDGMENTS

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CHAPTER 1

INTRODUCTION

Mutual fund performance has always been one of the most researched areas of finance studies. Using diverse technical measurement methods, these types of studies analyze fund performances of various markets from different perspectives. Notably, following the period of liberalization of the financial markets, mutual funds have gained much more importance in the eyes of investors, resulting in numerous studies that have been carried out on performance evaluations. Mutual funds bring investors who share a common goal together. According to Deepak (2011), investors invest the money they collect into capital market instruments such as shares, debentures and other investment securities. The total income acquired from investments and the capital appreciation is equally shared among unit holders by taking into account the units owned by them. As a consequence, mutual funds are a suitable investment for the common man, as they provide the opportunity to invest various professionally managed securities at a relatively low cost.

According to Rao (2006), mutual funds are invested in diversified portfolios and fund managers take different levels of risk into account in order to achieve the scheme's objectives. Hence, when evaluating and comparing schemes, the returns should be measured by taking into consideration the risks involved in achieving the returns. Evaluation is important, not only to the individual or the institution that engages a professional money manager, but also to the individual who invests personal funds. Portfolio evaluation has gained importance steadily over the last two decades. According to Elton, Brown, & Goetzmann (2003), the acceptance of

modern portfolio theory has changed the evaluation process from crude return calculations to detailed explorations of risk and return as well as the sources of each.

The global crises emerged in America in 2008 and later spread to other countries, affecting especially the economies of Europe and America and their financial markets a great deal. The American and European economies went into recession and some significant financial investment banks collapsed, such as Lehman Brothers. Also, in Europe, banking crises occurred in various countries led by Portugal, Ireland, Spain, Greece, and Italy. This situation, in the eyes of investors, made America and Europe lose their reputation of being the "safe port" and making investors turn towards other stock markets for investment purposes.

As of the 2000s, developing countries strengthened their economies with economic reforms and were not affected by the global crisis of 2008 as much as developed countries were. This made them more inviting to investors. Kremnitzer (2012) mentioned "emerging markets have provided opportunities like excess returns and portfolio diversification, exhibiting low correlations with developed markets and thus offering diversification possibilities for investors, reducing portfolio risk" (p. 2). After the crisis, interest rates in America and Europe were near zero while developing countries were offering higher interest rates along with credibility, which resulted in the shifting of capital into those countries.

To ease the recession, the FED applied a policy of quantitative easing. Between December 2008 and October 2014, the FED bought huge quantities of government bonds and bills from the markets to enhance the money supply for the sake of encouraging the revival of the economy. Excess liquidity in the financial markets along with the near-zero interest rates in Europe and America caused the

"cash flow" from Europe and America to the stock markets and investment funds of developing countries.

In this period, the stock markets of Turkey, India, Brazil, Russia, China, Taiwan, Poland, Mexico, and South Africa in particular had shown great improvement and there was a huge cash flow to those countries. The main objective of this work is to detect how investment funds were affected parallel to this growth in developing countries' financial markets and the performances shown by fund managers at the time of this quantitative easing policy.

In the literature, there are many researches that study investment funds and the performances of the managers who control these funds, especially in America and Europe. Moreover, as of the 2000s, the same types of studies were also done for developing countries. However, there has been no recent investigation on fund performances in the era of quantitative easing.

The objective of this analysis is to fill this void and to further understanding. In the future, this study can be developed even further by applying persistence analysis. Finally, there is no comparative study on investment fund performances that cover Turkish funds. This research, among other things, is designed to fill a gap in the financial literature concerning our country.

Chapter 1 begins with an overview of the mutual fund industry, explains the advantages and disadvantages of mutual funds, the types of mutual fund, systematic and nonsystematic risks, and finally the policy of quantitative easing and its terms.

Chapter 2 gives literature reviews of studies that have been done in both developed and developing countries.

Chapter 3 explains which technical measurements are used in this study. The Sharpe (1966), Treynor (1965), Jensen's alpha (1968), Sortino (1994) and M^2 (1996) ratios are used for evaluating fund performances. Jensen's alpha also helps to identify the selectivity skills of fund managers. In order to test mutual fund managers' market timing ability, the Treynor & Mazuy (1966) and Henriksson & Merton (1981) methods are applied.

Chapter 4 describes the data used in the study. The question of "Why and how were the six emerging countries chosen in this comparative study?" is answered. The approach in the selection of equity funds, benchmarks, and risk-free rates are explained for each country in this chapter.

Chapter 5 gives results and analyses for each country. The descriptive statistics of fund returns and the empirical results of the Sharpe (1966), Treynor (1965), Jensen's alpha (1968), Sortino (1994) and M^2 (1996) ratios as well as the Treynor & Mazuy (1966) and Henriksson & Merton (1981) regression analysis models are explained.

Chapter 6 is the conclusion of the study. This study is summarized and findings are interpreted.

1.1 The mutual fund industry: An overview

According to the data of the Investment Company Institute[1], mutual fund assets increased to $31.38 trillion at the end of the fourth quarter of 2014. In the fourth quarter, worldwide net sales to all funds was $364 billion, compared to $322 billion of net inflows in the third quarter of 2014.

[1] http://www.ici.org/research/stats/worldwide/ww_12_14

In 2013, total worldwide mutual fund assets were $30 trillion and the American mutual fund market remained the largest in the world with $15 trillion in assets as shown in Figure 1. Europe, Africa and Asia Pacific, and Other Americas followed the U.S. with 31%, 12% and 7%, respectively. In terms of types of funds, equity funds dominated mutual funds assets in the U.S. as shown in Figure 2. Equity funds consisted of 52% percent of funds (38% of were domestic equity funds and 14% were world equity funds). Following these, bond funds, money market funds and hybrid funds were the most common, in that order.

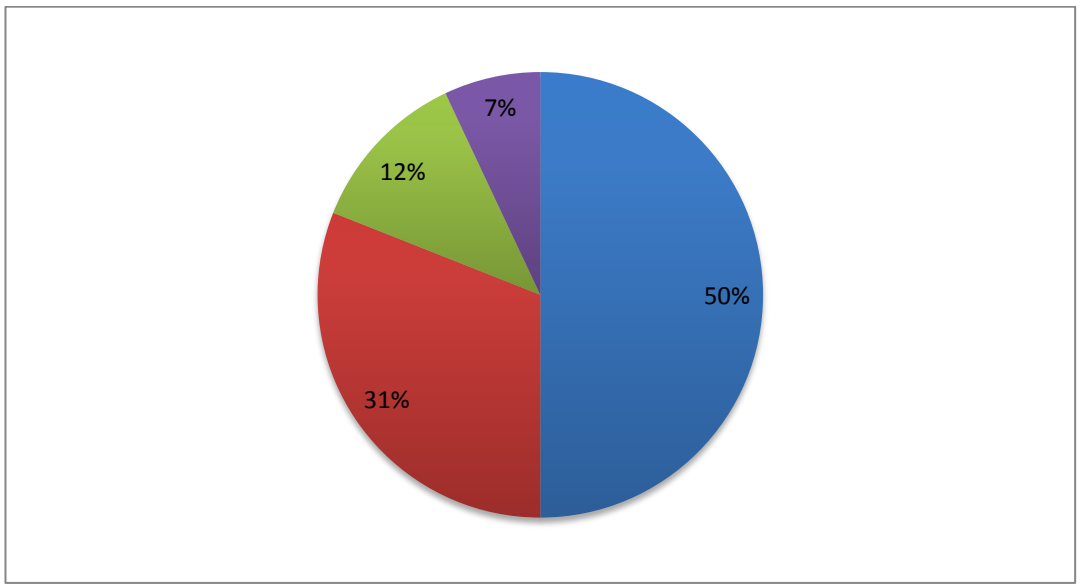

Fig. 1. Percentage of total net assets, year-end 2013

Source: This figure is taken from http://www.icifactbook.org/fb_ch2.html#investor

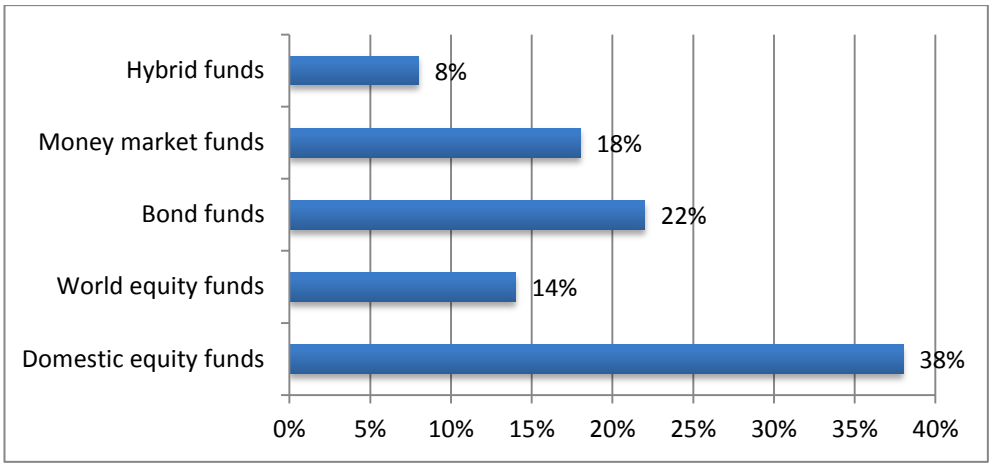

Fig. 2. Percentage of U.S. mutual fund assets

Source: This figure is taken from http://www.icifactbook.org/fb_ch2.html#investor

As shown on Figure 3, equity funds dominated worldwide mutual fund assets at 44% percent of the total. The asset share of bond funds was 24% percent, money market funds was 14% percent, balanced/mixed funds was 13% percent and other/unclassified funds was 5% percent at the end of 2014.

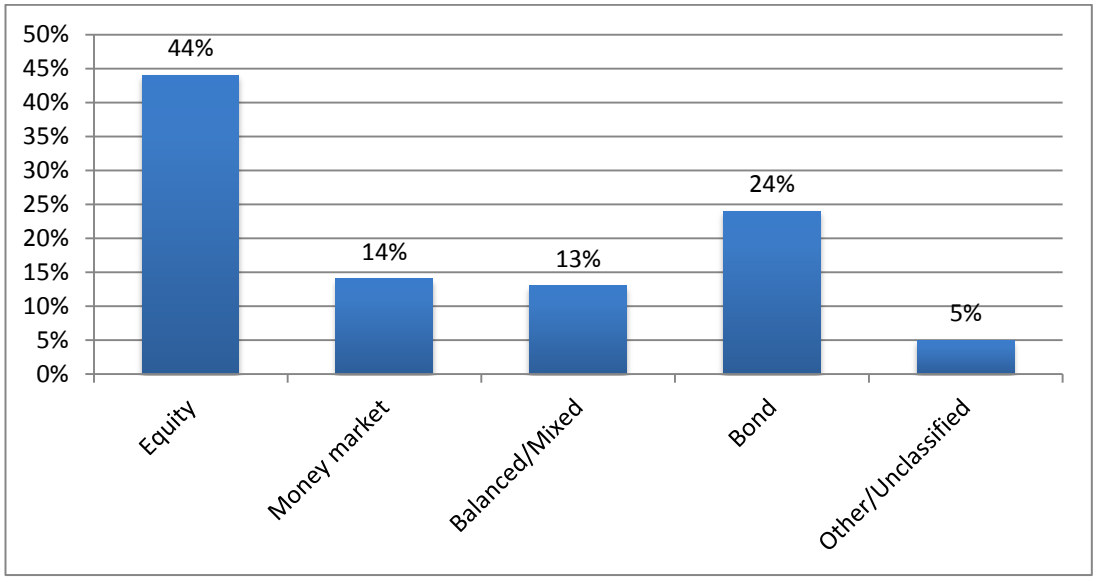

Fig. 3. Percentage of worldwide mutual fund assets by type of fund, 2014:Q4

Source: This figure is taken from http://www.ici.org/research/stats/worldwide/ww_12_14

According to reports of the Investment Fund Company Institute and the International Monetary Fund, financial markets in emerging markets have increased remarkably, especially over the last 15 years. Since the global financial crisis, portfolios have flowed rapidly from developed markets to developing markets. Emerging market economics received cumulative gross capital inflows of approximately $10 trillion between 2000 and 2013, as shown in Figure 4. These inflows came from foreign direct investment, other investment inflows and portfolio capital flows. Portfolio capital inflows, which rise from foreigner's net purchases of stocks, bonds and other securities, were issued in emerging markets. Since 2005, foreign investor holdings of emerging market equities and bonds increased steadily. In 2005, foreigners held $1.5 trillion in assets from emerging market stocks and bonds. In 2013, this number increased to $3.5 trillion, which means it has roughly doubled since 2005, as shown in Figure 5.

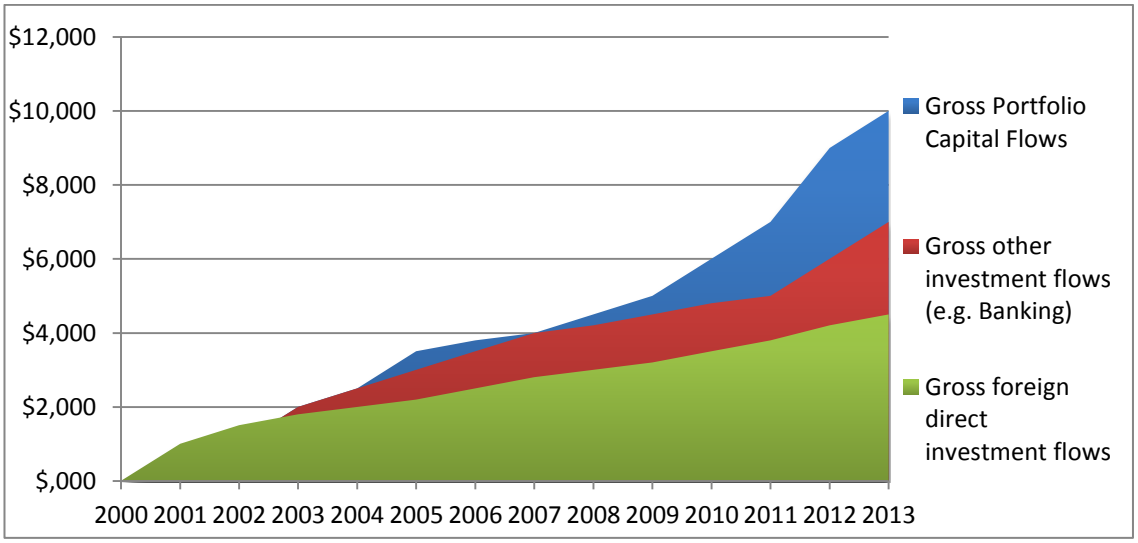

Fig. 4. Cumulative gross capital inflows to emerging markets, in trillions of U.S. Dollars; yearly 2000-2013

Source: This figure is taken from http://www.ici.org/pdf/icig_per02-01.pdf

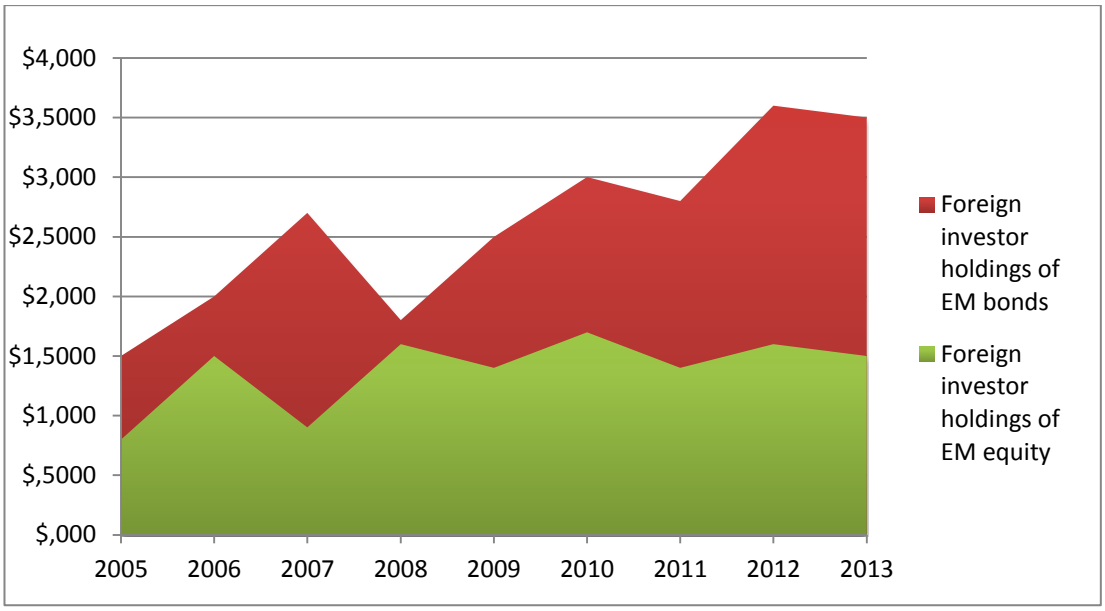

Fig. 5. Foreign investor holdings of emerging market equities and bonds

Source: This figure is taken from http://www.ici.org/pdf/icig_per02-01.pdf

1.2 Advantages and disadvantages of mutual funds

According to a report by the U.S. Security and Exchange Commission (SEC), there are advantages and disadvantages of mutual funds. However, advantages and disadvantages can be changed according to the attitudes of investors in some cases.

The advantages of mutual funds are professional management, diversification, affordability and liquidity. Skilled managers from investment companies manage funds. These executives can easily reach, research, and select data and monitor performances of funds. Furthermore, funds consist of portfolios where risk is diversified. Diversification is the strategy used to reduce risk by creating a portfolio of different instruments such as equity, bonds, real estate and so on. Spreading investment across a wide range of companies or industrial sectors can protect from a failing of one company or industry. Creating portfolios with mutual funds is better than only investing in individual stocks or bonds. Some mutual funds accommodate investors who don't have a lot of money to invest by setting a

relatively low dollar amount for initial purchases, subsequent monthly purchases, or both.[2] Mutual fund shares can simply be redeemed at the current net asset value.

The disadvantages of mutual funds are risk, lack of control, fees and taxes. Mutual funds are accepted safety tools for investors. However, there are also risks that cannot be abolished or eliminated because of the characteristics of the finance industry. Investors cannot control funds when they invest in mutual funds. Managers control funds and investors cannot directly influence managers when they buy or sell shares. Mutual funds charge fees that cover their daily expenses. In addition to this, many also have commission fees and other expenses that must be paid to brokers or consultants. (Yalçın, 2012, p. 7).

1.3 Mutual fund types

Mutual funds are divided into two categories: open-end funds and close-end funds. According to the SEC (U.S Security and Exchange Commission), for open-end funds, investors purchase shares in mutual funds from the fund itself through a broker and cannot purchase shares from other investors on a secondary market. Fund shares are redeemable, which means that when mutual fund investors want to sell their funds' shares, they sell them back to the fund or to a broker acting for the fund. Mutual funds generally sell their shares on a continuous basis, although some funds stop selling when, for instance, they reach a certain level of assets under management. On the other hand, close-end funds do not generally continuously offer their shares for sale. Instead, they sell a fixed number of shares at one time in an initial public offering, after which time the shares typically trade on a secondary

[2] https://www.sec.gov/investor/pubs/sec-guide-to-mutual-funds.pdf

market. Close-end fund shares are not convertible, so a close-end fund is not required to buy its shares back from investors upon request.

There are some important fund types that are common in financial markets.

Money Market Funds: Money market funds have lower risks compared to other funds. They can be used in only certain high quality and short-term investments.

Bond Funds: These funds are invested primarily in government or corporate debt. The objective of these funds is to provide steady cash flows to investors.

Equity Funds: Equity funds invest in company stocks and are riskier and prone to price changes. These funds are very popular among retail investors. Due to their high volatility, these funds are considered a high-risk investment in the short term, but at the same time returns on these funds are higher.

Index Funds: These type funds are passive investments that are invested in benchmarks such as the S & P500, Borsa Istanbul etc. Returns are related to movements in the stock exchange.

Balanced Funds: These funds invest in both equities and fixed-income securities. They try to balance out to create stable proportions. Aggressive funds have a greater equity share than fixed-income securities. On the other hand, conservative funds have more fixed-income securities than equity funds.

Specialized Sector Funds: Some funds only concentrate on a particular industry. For example: the automobile industry, telecommunications and so forth.

1.4 Systematic and nonsystematic risks

One of the most significant functions of portfolio management is producing a relationship between “risk” and “risk and return.” The most important thing to consider when investing in securities is the relationship between the risk of the security and the returns. Selecting the tools of investment requires a great deal of comparison between these two things and the determination of a proper exchange between them. Generally, investors, even though they have good amount of knowledge on “rates of return,” lack information when it comes to the term “risk.” Therefore, it is crucial to clarify the risk types and the sources of total risk in order to make conscious investment decisions. As seen in Figure 6, risk sources are separated by systematic risks and nonsystematic risks. Systematic risks include purchasing power risk, interest rate risk, market risk, political risk and exchange rate risk. On the other hand, nonsystematic risks include business and industrial risk, financial risk and management risk.

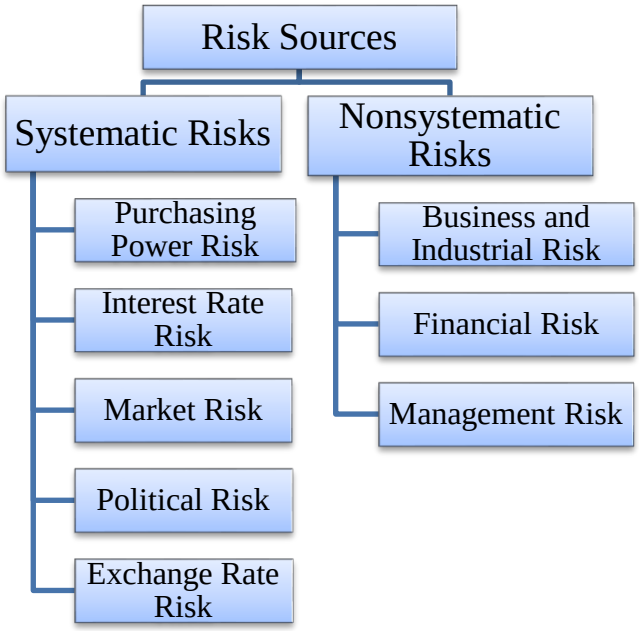

Fig. 6. Resources of total risk

1.4.1 Systematic risks

Social, political and environmental changes are the sources of systematic risk. These alterations impact securities markets. Systematic risk is a factor that influences all securities' values in the financial market. Systematic risk cannot be controlled by investors and is not abolished with diversification of risk. According to Öztin Akgüç (1989), "It can also be defined as unavoidable risk by diversifying the systematic risk portfolio." (p. 667, own translation).

1.4.1.1 Purchasing power risk

Purchasing power risk is also called inflation risk. Because of changes in purchasing power parity due to inflation, returns on investments could be less in the future. Because investments from bond to stocks are priced to include expected inflation rates, it is unexpected changes that produce this risk. Fixed income securities, such as bonds and preferred stock, subject investors to the greatest amount of purchasing power risk since their payments are set at the time of issue and remain unchanged regardless of inflation ("Financial Dictionary," n.d.). Inflation influences expected returns and the value of securities. Hence, inflation is one of the important factors that create real profit returns of investment securities.

1.4.1.2 Interest rate risk

Interest rate risk influences the value of investments due to changes in inflation rates either decreasing or increasing. Changes in interest rates cause both alterations to the market price of interest yielded securities and the productivity of these securities. Interest rate risks affect the value of bonds more than stocks. As interest rates increase, the value of bonds decreases.

1.4.1.3 Market risk

Market risk can be identified as the risk of financial loss resulting from movements in market prices. In capital markets, the market prices of some financial assets may decrease greatly. While these losses are sometimes associated with a certain reason or reasons, other times they have no valid explanation. Companies cannot control price changes due to market risk. Political instability, unexpected wars, election years or so forth can be examples of market risk. Every investor faces market risk as the securities market follows economic indicators, recessions and the normal business cycle. The most basic strategy for minimizing market risk is diversification. A well-diversified portfolio consists of securities from various industries, asset classes and countries with varying degrees of risk. The specific risks will balance each other out but some market risk will always remain. ("Investingananswers," n.d.).

1.4.1.4 Political risk

Global or domestic political risks or wars are very effective at affecting the behavior of investors. Political risk can affect the operations and profitability of a business as quickly and directly as any financial, physical, or market risk factor. The impact of political risk is considered to be long-term because the risk rises over time, given the greater potential for events and changes over time. ("Investingananswers," n.d.).

1.4.1.5 Exchange rate risk

Exchange rate risk is the changing of investment value due to changes in currency exchange rates. It affects the exports/imports of countries and investment decisions of investors. Any changes in currency rates lead to either a decrease or increase of investment value. For instance, currently the value of the Turkish Lira is depreciating

against the dollar and financial markets are highly volatile. These create exchange rate risks for both investors and importers/exporters.

1.4.2 Nonsystematic risks

Nonsystematic risks are a part of total risk and are special risks to any company or sector. Mismanagement, labor unrest, advertisement campaigns, changes of consumer behaviors, and changes in company income or profit lead to nonsystematic risk. Nonsystematic risk is independent from other industries and factors that influence financial markets. Systematic risk can be abolished with successful diversification. According to Ali Ceylan and Turhan Korkmaz (1993) "Systematic risk cannot be controlled, but nonsystematic risk can be decreased or eliminated with changes." (p. 50, translation is my own).

1.4.2.1 Management risk

The success of a company is directly related to the management teams of the company. The risks associated with unproductive, destructive or failed management hurt shareholders and the company or fund being managed. This term refers to the risk of the situation in which the company and shareholders would have been better off without the choices made by management. ("Investopedia," n.d.)

1.4.2.2 Financial risk

Financial risk is the loan default of a company. If a company's cash flows are not adequate meet its financial obligations due to external and internal factors, investors lose their money if they invest in the stock of these companies. Also, if a company or government defaults on its bonds, bondholders will lose their money. The financial risks of these companies can be increased due to debt expansion, fluctuations of

sales, inadequate net working capital and so on. These kinds of factors impact investor decisions.

1.4.2.3 Business and industrial risk

Due to economic conditions in one or more industries, a company's profit can be affected unfavorably. Investors can lose money if they invest in these companies. Investors should carefully follow macroeconomic conditions that as they relate to specific industries. There is always the possibility that a company will have lower than anticipated profits, or that it will experience a loss rather than a profit. Business risk is influenced by numerous factors, including sales volume, per-unit price, input costs, competition, the overall economic climate and government regulations. A company with higher business risks should choose a capital structure that has a lower debt ratio to ensure that it can meet its financial obligations at all times. ("Investopedia," n.d.).

1.5 Quantitative easing

After the global financial crisis of 2008, the Fed decided to use a policy of quantitative easing (QE) to lower long-term interest rates. Quantitative easing (QE) is a massive expansion of the open market operations of a central bank. The bank buys securities from its member banks to add liquidity to capital markets. This has the same effect as increasing the money supply. ("Useconomy," n.d.). During the quantitative easing policy term, monetary supply increases and engender plethora of money in the financial markets. A great amount of money flows from developed countries to developing countries.

The policy of quantitative easing policy is separated into four periods. (Useconomy, Wikipedia, 2015).

QE1 (December 2008 - June 2010)

The US Federal Reserve held between $700 billion and $800 billion worth of Treasury notes on its balance sheet before the recession. In late November 2008, the Federal Reserve started buying $600 billion in mortgage-backed securities. By March 2009, it held $1.75 trillion of bank debt, mortgage-backed securities, and Treasury notes; this amount reached a peak of $2.1 trillion in June 2010.

QE2 (November 2010 - June 2011)

In November 2010, the Fed announced a second round of quantitative easing, buying $600 billion of Treasury Securities by the end of the second quarter of 2011.

QE3 (September 2012 - October 2014)

The Federal Reserve decided to introduce a new $40 billion per month, open-ended bond purchasing program of agency mortgage-backed securities.

QE4 (January 2013 - October 2014)

The Fed decreased its bond purchases from $85 billion a month to $65 billion a month during the upcoming September 2013 policy meeting. Purchases were finished on October 29, 2014 after gathering $4.5 trillion in assets.

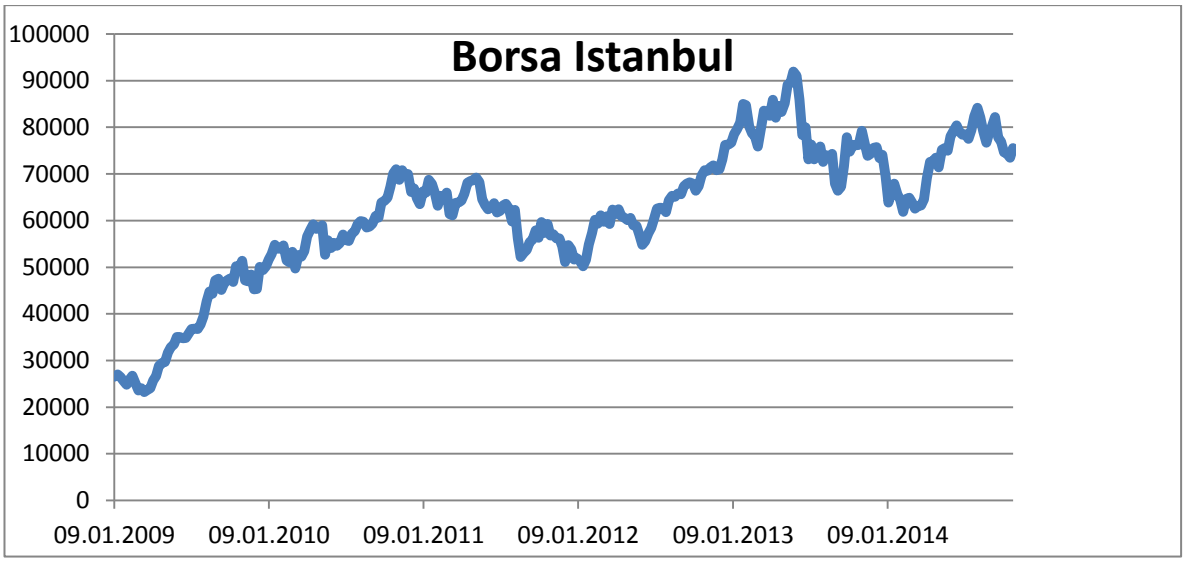

Fig. 7. Performance of Borsa Istanbul (January 2009- October 2014)

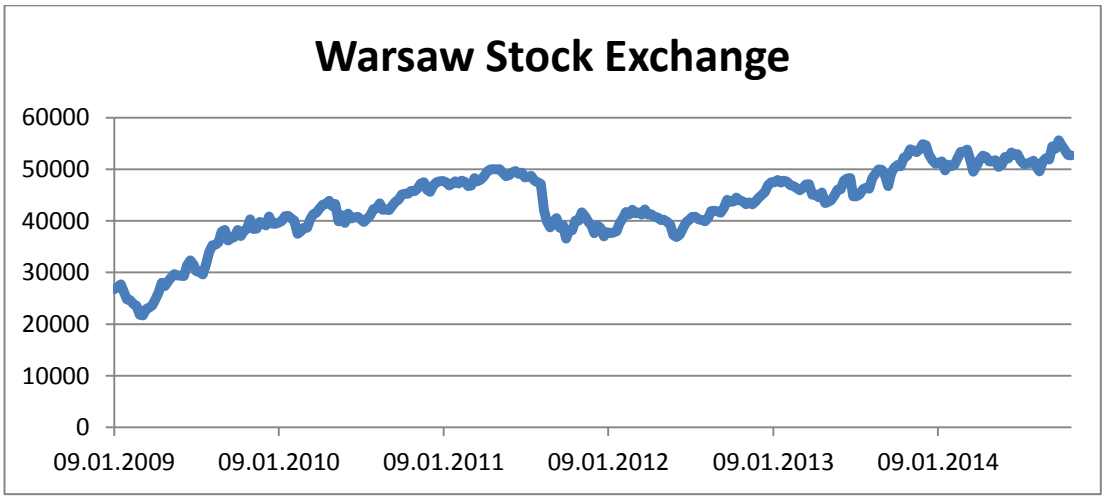

Fig. 8. Performance of the Warsaw Stock Exchange (January 2009- October 2014)

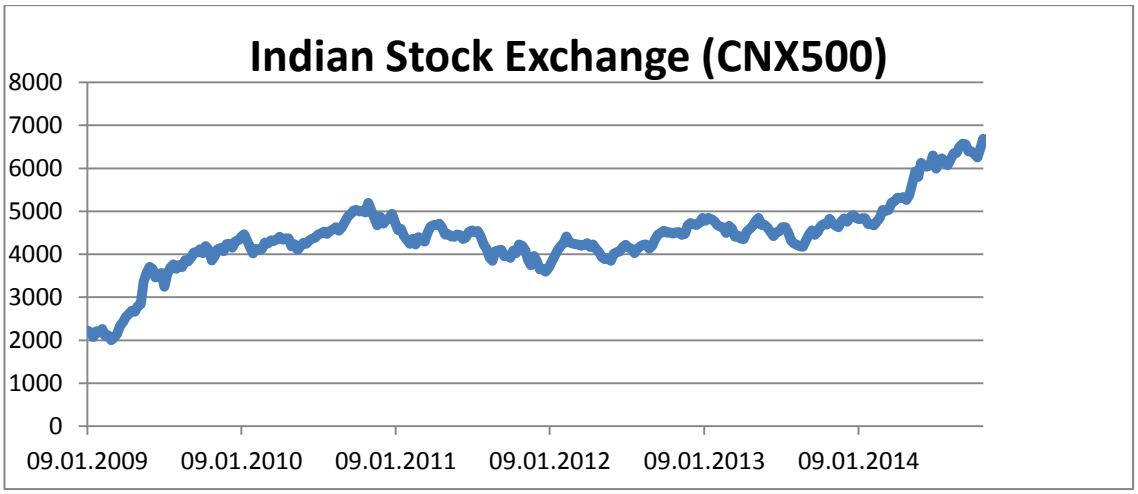

Fig. 9. Performance of the Indian Stock Exchange (CNX500) (January 2009- October 2014)

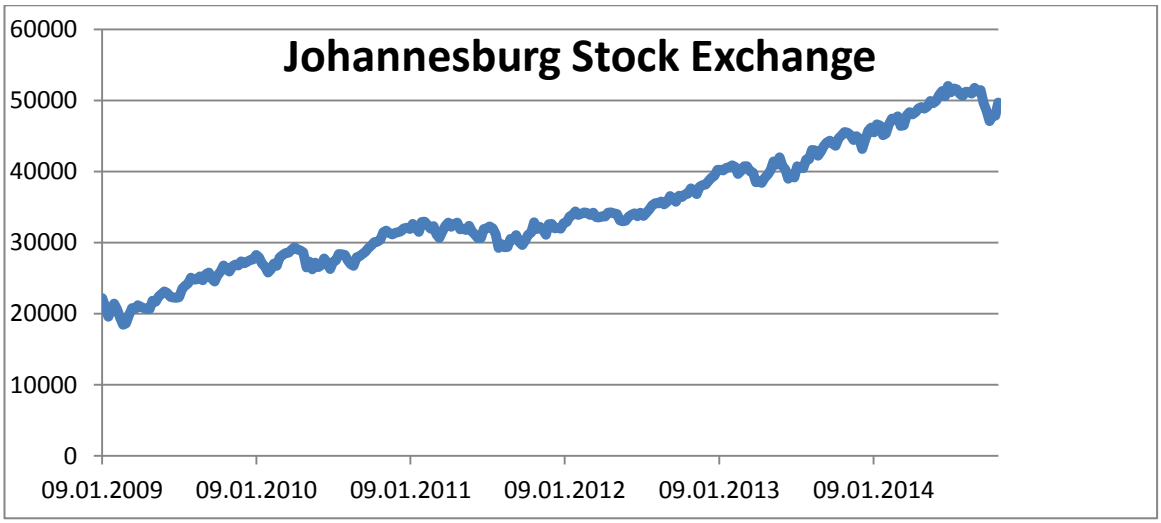

Fig. 10. Performance of the Johannesburg Stock Exchange (January 2009- October 2014)

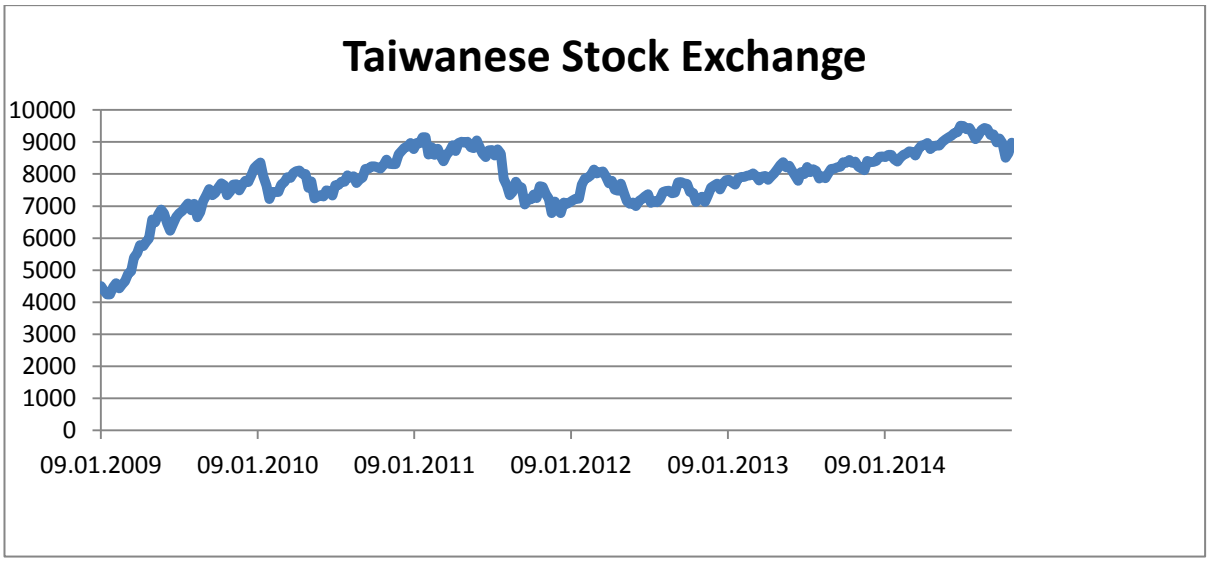

Fig. 11. Performance of the Taiwanese Stock Exchange (January 2009- October 2014)

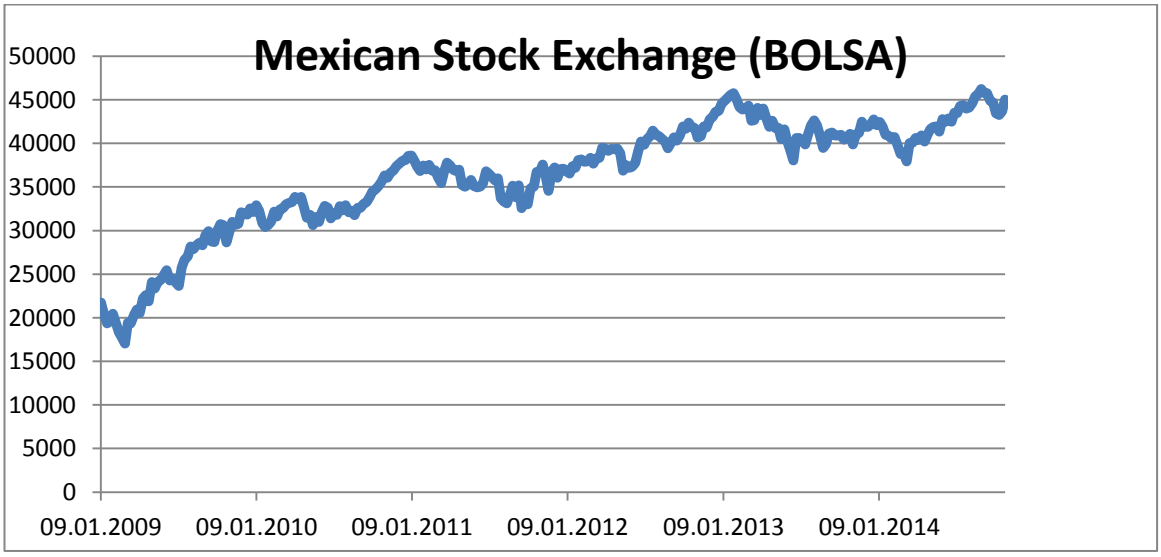

Fig. 12. Performance of the Mexican Stock Exchange (BOLSA) (January 2009- October 2014)

CHAPTER 2

LITERATURE REVIEW

Beginning from the 1960s, there have been several studies carried out on mutual fund performance. Treynor (1965), Sharpe (1966) and Jensen (1968) are among those who measure fund performance related to risk and return measurements. Sharpe (1966) measured 34 open-ended mutual funds between 1954-1963 using the Sharpe ratio and Treynor ratio. As the result of the study, it has been found out that while 11 funds out of 34 show a better performance than the index, 23 funds underperform their benchmarks. Jensen (1968) examined 115 mutual funds - which were active between 1945-1964 – by using an alpha indicator that he generated. His alpha indicator shows the selectivity skills of fund managers. Based on his results, funds could not outperform the market performance, revealing that mutual fund managers, in general, did not have selective ability.

McDonald (1973) computed mutual funds invested between 1964 and 1969 by using the Treynor, Sharpe and Jensen measures. The study showed that there was a positive correlation between risk and return.

Ippolito (1989) focused on evaluating 143 mutual funds invested between 1965 and 1984 and compared them with the index fund. The results that he found with higher turnovers, fees, and expenses earn rates of return sufficiently high enough to offset the higher charges. These results are consistent with the notion that mutual funds were efficient in their trading and information gathering.

Blake, Elton and Gruber (1993) examined 56 bond funds with alpha coefficients obtained from a multiple regression analysis between the years of 1979

and 1989. Taking into account a survivorship bias of funds in this study, they find that bonds, in general, showed a lower performance than sample portfolios.

Malkiel (1995) used the Jensen method to calculate the performance of American funds between the years 1972 and 1990. He revealed that mutual funds could not show positive excess return.

Detzler (1999) searched 19 global bond funds by using monthly returns between the years 1985 and 1995. In the study, a multiple regression analysis was used and it was found out that funds could not show better performance than indexes.

Dahlquist, Engström and Söderlind (2000) evaluated 201 Swedish mutual funds – including only domestic funds - from the period between 1993 and 1997. They found that regular equity funds seemed to over perform while bond and money market funds performed less. Furthermore, actively managed funds demonstrated better performance than passively managed funds.

With the aim of detecting the market timing ability of the fund managers, Treynor and Mazuy (1966) established the quadratic regression analysis method. They applied this method to 57 open-end mutual funds (25 growth funds and 32 balanced funds). They revealed only a single fund as having statistically significant market timing ability.

Henriksson and Merton (1981) and Henriksson (1984) developed both parametric and nonparametric statistical models to the test market timing ability of portfolios. Having been introduced by Henriksson and Merton (1981), the parametric and non-parametric tests in question were applied by Henriksson (1984) to evaluate the market timing ability of 116 open-end funds between 1968 and 1980 in the U.S. market. The results revealed that there wasn't any support for market timing ability.

Moreover, Henriksson found an inverse relationship between selection ability and market timing ability.

Chang and Lewellen (1984) tested the market timing ability of 67 U.S. funds covering the period from 1971 to 1979 by using the Henriksson & Merton (1981) method. It was found that there were weak indications of fund manager market timing ability.

Gallo and Swanson (1996) tested 37 U.S. mutual funds by using the Treynor & Mazuy model for market timing, yet found no evidence of market timing of funds.

Christensen (2005) evaluated 47 Danish funds between January 1996 and June 2003. He found that fund managers did not have selectivity skills in general and, in terms of timing ability, the results were also negative, due to the fact that only two funds had significant timing ability.

There are also some studies about mutual fund performances in emerging markets. For instance, in Turkey, studying mutual fund performance became very popular among academicians after the 1990s. Karatepe and Karacabey (2000) evaluated 9 A-Type funds using the Sharpe, Treynor, Jensen and Graham & Harvey methods during the period of 1997-1999. The Graham & Harvey method was developed as an alternative method to traditional evaluation methods and it identified that there are no more differences between the new method and traditional methods. Consequently, it was found out that nine funds did not have a better performance than the market.

Gürsoy and Erzurumlu (2001) examined 55 A-Type and 77 B-Type funds between the years 1998-2000 using the Sharpe, Treynor, Jensen and Graham &

Harvey methods. Consequently, it was found that both A-Type and B-Type funds showed lower performances than the market.

Kılıç (2002) investigated 75 A-Type and 65 B-Type funds between the years 1999-2001. He found that funds mostly showed lower performances than the market.

Arslan (2005) analyzed 45 mutual funds between the periods of January 2002- December 2005. He applied quadratic regression in order to find timing ability among managers. According to his results, only 3 of the 45 funds had positive "c" coefficients, showing that fund managers did not have market timing ability.

Yıldız (2005) evaluated 53 A-Type funds between the years 2001-2004. In this research, not only had the Stock Exchange Index had been used as a benchmark but also the Fund Index that was developed by the Institutional Investment Managers Association. The results found that A-Type funds had lower performances than index. On the other hand, A-Type funds had a relatively higher performance than the Fund Index.

Akel (2007) used single index models to a free survivorship bias database of 51 A-Type and 51 B-Type mutual funds. He then examined the market timing ability of fund managers. He revealed that A-Type mutual fund managers did not have selectivity skill and timing ability while B-Type mutual fund managers did have selection ability.

M. Arslan and S. Arslan (2009) evaluated 12 mutual funds with daily return data for the period between January 2006 and February 2010. All funds had a positive alpha, showing that fund managers were successful in terms of selective ability, while the quadratic regression test found only one fund was positive, and that, in turn, only one fund manager had timing ability.

Korkmaz and Uyguntürk (2009) compared the performance of weighted stock mutual funds traded in Turkey between the November 2006 and November 2009 and investigated the timing ability of mutual fund managers. In order to analyze timing ability, the quadratic regression analysis and dummy variable regression analysis methods were applied. The results demonstrated that no funds were statistically significant, which implied that fund managers were not successful at timing ability.

Omağ (2010) investigated A-Type and B-Type funds between 2000-2008 by using the Sharpe ratio, the Treynor ratio and Jensen's performance measure. It was found that the BIST100 index and risk-free securities had a higher return than the funds and that, according to Jensen's performance measure, the portfolios indicated poor performance, which denotes that their returns were lower than the market.

Gökgöz and Günel (2012) applied single-index models (Sharpe, Teynor, Sortino and Jensen's alpha) for 6 monthly sub-periods to A-Type and B-Type funds during the period of 2008-2009. It was found out that single index models provided significant results.

In Poland, Swinkels and Rzeznizcak (2009) investigated managers' selectivity and market timing skills of 38 mutual funds (consisting of equity, balanced and bond funds) using monthly fund returns from the period between February 2000 and April 2007. According to their analysis, fund managers did not have selective ability. Furthermore, fund managers did not have market timing ability either.

Using a multi-factor Carhart model, Białkowski and Otten (2011) tested the performance of the 140 Polish mutual funds over the period 2000-2008. They came up with two different outcomes: first, Polish funds had lower performance than the

benchmark. Second, domestic funds had a preferable performance over international funds.

In India, Sapar and Madava (2003) evaluated the performance of Indian Mutual Fund Schemes during the bear market between September 1998 – April 2002 using the Treynor, Sharpe, and Jensen methods, the Relative Performance Index (RPI), a risk-return analysis and Fama's measure. Of 269 schemes, 49 under performed, 102 were performed on par and 118 outperformed the market.

Sharad and Ranganatham (2005) evaluated Indian funds and separated them into public sector sponsored funds and private sector sponsored funds over a period between May 2002 and May 2005. They found that both these funds did not differ statistically in terms of mean returns, whereas there were statistically significant differences between both funds in respect to average standard deviation, average variance, coefficient of variation (VAR) and residual variance (RV). Furthermore, RV had a direct impact on the Sharpe fund performance measure.

Rao (2006) computed 21 Growth plans and 21 Dividend plans in India during the period between April 2005 and March 2006. The study covered a 12-month period when the Indian stock market was generally bullish. The results showed that Growth funds were better than Dividend funds.

Duggimpudi, Abdou and Zaki (2010) evaluated the performance of 17 equity-diversified mutual funds in the Indian market over the last ten years. Two different overlapping period samples between 2000 and 2009 and between 2005 and 2009 were used. In this study, the Sharpe, Treynor and Jensen's alpha methods were applied and the results showed that 17 funds outperformed the markets.

In Taiwan, Hsu, S. Ou, Yang, Y. Ou (2012) investigated the performance of 30 Taiwan open-end equity mutual funds and the sample period was divided into two sub-periods, the bull and the bear market. By using the Sharpe ratio, the Treynor ratio, and the SRAROC, ERAROC, GRAROC and HRAROC models, they tested performance evaluation and performance persistency. According to their statistical results, equity mutual funds had a positive performance in the bull market and a negative performance in the bear market.

Hou (2012) investigated the performance persistence and investor timing ability of 200 Taiwanese domestic equity mutual funds during the period between 1996 and 2009. The empirical results showed that timing ability of investors was negatively related to fund performance. The results also denoted that investors' timing performances were significantly and negatively related to fund size, length of fund history, and momentum-style funds but positively related to value-style funds. These results suggested that mutual fund investors were loss-averse and demonstrated return-chasing behavior in well-performing funds.

Manjezi (2008) investigated 15 South African funds during the period between 2001 and 2006. According to his results, the index showed a better performance than funds. In addition, only one fund displayed both selective and market timing ability during the study period.

CHAPTER 3

METHODOLOGY

In this study, the performance of equity funds in emerging markets is evaluated using the Sharpe (1966), Treynor (1965), Jensen's alpha (1968), Sortino (1994) and M^2 (1996) ratios. Jensen's alpha method also shows the selectivity skills of fund managers. In order to test mutual fund managers' market timing ability, the Treynor & Mazuy (1966) and Henriksson & Merton (1981) methods are applied.

3.1 Treynor ratio

According to (Kouris, Adam, & Botsaris, 2011) the Treynor ratio is the first risk-adjusted performance measure of mutual funds that was put forward by Treynor in 1965. It is calculated as the ratio of the excess return of the mutual fund divided by its beta (systematic risk) and is defined as:

$$T_i = (R_p - R_f) / \beta_P \quad (1)$$

where

T_i = Treynor's performance index

R_p = portfolio's actual return during a specified time period

R_f = risk-free rate of return during the same period

β_P = beta of the portfolio

According to Reilly (1992), whenever $R_p > R_f$ and $\beta_p > 0$, a larger T value means a better portfolio for all investors regardless of their individual risk preferences. In two cases, a negative T value may result: when $R_p < R_f$ or when $\beta_p <$

0. If T is negative because $R_p < R_f$, then we deduce that the portfolio performance is very poor, whereas if the negativity of T comes from a negative beta, the fund's performance is excellent. Finally, when $R_p - R_f$, and β_p are both negative, T will be positive, but in order to qualify the fund's performance as good or bad we must see whether R_p is above or below the security market line pertaining to the analysis period. Treynor used the concept of the characteristics line to partition stock market returns into systematic and non-systematic risks. The slope of a characteristics line is beta (systematic risk) and measures the relative volatility of mutual fund returns. Treynor presumed that a mutual fund is a completely diversified portfolio. Thus, it does include any non-systematic risk. (Hsu, Ou, Yang, & Ou, 2012, p. 249).

3.2 Sharpe ratio

According to Noulas &Lazaridis (2005), the Sharpe technique was developed in 1966 and is fairly similar to the Treynor technique, but the Sharpe technique uses the total risk of the portfolio rather than systematic risk. This technique computes the risk premium earned per unit of the total risk. The Sharpe value can be calculated as follows:

$$S_p = (R_p - R_f) / \sigma_p \qquad (2)$$

where

S_p = Sharpe Ratio

R_p = the average rate of return for a fund

R_f = the average risk-free return

σ_p = the standard deviation of the fund.

The Sharpe ratio (S_p) evaluates the performance of its level of total risk. A higher value of this ratio indicates that the fund delivers a higher performance by using standard deviation (σ_p). (Duggimpudi, Abdou, & Zaki, 2010, p. 79). The higher the σ_p, the greater the volatility and the higher the Sharpe ratio. Hence, a higher Sharpe ratio indicates a better fund performance than a lower ratio (Hsu et al., 2012, p. 249).

3.3 Jensen's alpha

As Jensen (1968) explained, "a portfolio manager's *predictive ability* – that is, his ability to earn returns through the successful forecast of security prices that are higher than those which we could presume given the level of his riskiness of his portfolio" (p. 389).

Jensen's model can be written as:

$$R_{pt} - R_{ft} = \alpha_p + \beta_p (R_{mt} - R_{ft}) + e_{pt} \quad (3)$$

α_p = the excess return on the portfolio after adjusting for the market

R_{pt} = the return on the portfolio p at time t

R_{ft} = the return on a riskless asset at time t

R_{mt} = the return on the market portfolio at time t

β_p = the sensitivity of the excess return on the portfolio t with the excess return on the market

With respect to Elton & Gruber (2011), this measure has a lot of appeal because α_p represents deviations from the Capital Asset Pricing Model and as such has a theoretical basis. The Jensen measure can also be viewed as how much better

or worse did the portfolio manager do rather than simply holding a combination of the market and a riskless asset with the same market risk as the portfolio in question. The Jensen performance index permits the comparison of portfolio managers' performance relative to one another or to the market. The numerical values of alpha permit the ranking of performance, with the higher scores showing better performances. The sign of the alpha displays whether the portfolio manager is superior to the market after adjusting for the risk of the portfolio. A positive alpha denotes a better performance relative to the market while a negative alpha indicates a poorer performance.

3.4 Sortino ratio

According to Lu & Zhao (2006), the Sortino ratio gives excess return per unit of risk, but uses downside semi-variance instead of total risk, the standard deviation of the portfolio. While returns of a portfolio are not normally distributed, a better measure than standard deviation for measuring an investment's risk is its downside semi-variance or downside semi-standard deviation. A large Sortino ratio indicates a low risk of large losses occurring.

$$SR = \frac{R_a - MAR}{\sqrt{\sum_{t=1}^{T} \frac{(R_{at} - MAR)^2}{T}}} \quad (4)$$

R_{at} is only calculated when $MAR > R_{at}$

SR = Sortino Ratio

R_{at} = returns on the portfolio at time t

R_a = average returns on the portfolio

MAR = minimum acceptable return

T = number of observed days

3.5 M^2 (Modigliani & Modigliani) ratio

According to Bodie, Kane, & Marcus, (1999) like the Sharpe ratio, the he M^2 measure focuses on total volatility as a measure of risk, but its risk-adjusted measure of performance has the easy interpretation of a differential return relative to the benchmark index. Franco Modigliani and Leah Modigliani found this measure.

$$M^2 = r_{p*} - r_m \quad (5)$$

r_{p*} = adjusted portfolio

r_m = return of the market

or $$M^2 = r_f + (r_a - r_f)/\sigma_a \times \sigma_m \quad (6)$$

or $$M^2 = r_f + (Sharpe\ ratio \times \sigma_m) \quad (7)$$

r_f = risk-free rate

σ_m = standard deviation of the market

3.6 Treynor & Mazuy regression analysis

Investment managers may well beat the market if they are able to adjust the composition of their portfolios in time when the general stock market is going up or down. That is, if fund managers believe the market is going to drop, they alter the composition of the portfolios they manage from more to less volatile securities. If they think the market is going to climb, they shift in the opposite direction (Treynor & Mazuy, 1966, p. 132).

According to Coggin, Fabozzi, &, Rahman (1993), market timing refers to forecasts of return on the market portfolio. If the manager believes he can forecast the market return, he will adjust his portfolio risk level accordingly.

Mutual fund managers may hold a higher proportion of the market portfolio if they are qualified to predict future market conditions and envision the stock market as a bull market. On the other hand, mutual fund managers may hold a lower proportion of the market portfolio if they expect the market to underperform in the future. Treynor and Mazuy (1966) developed the following model to evaluate market-timing performance:

$$R_{i_t} - R_{f_t} = \alpha_i + \beta_{i_0}(R_{m_t} - R_{f_t}) + \beta_{i_1}(R_{m_t} - R_{f_t})^2 + \varepsilon \qquad (8)$$

According to Chen & Hu (2013), α_i is the timing-adjusted alpha, which represents the timing-adjusted selective ability of mutual fund managers. The quadratic term in equation (8) is the market timing factor and the coefficient of the market timing factor, β_{i_1}, represents mutual fund managers' market timing ability. If β_{i_1} is positive, mutual fund managers have superior market timing ability, i.e., the investment portfolios of mutual funds are adjusted actively to well-anticipated changes in market conditions. A negative β_{i_1}implies that mutual fund managers do not exhibit market timing ability.

3.7 Henriksson & Merton regression analysis

Another return-based approach for estimating performance is the option approach developed by Merton and Henriksson. The regression used is similar to the Treynor & Mazuy regression. In contrast to the linear beta adjustment of the Treynor and Mazuy framework, the portfolio beta in the Henriksson and Merton study is assumed

to switch between two betas. A large value if the market is expected to do well, i.e., when $R_m > R_f$ up market and a small value otherwise i.e., when $R_m < R_f$ (down market). Therefore, it is argued that a successful market timer would select a high up market beta and a low market beta. Thus, such a relationship can be estimated by equation using a dummy variable (Tripathy, 2005). The manager's market-timing ability is defined as the ability to anticipate whether the return on the risky asset will be higher or lower than the risk-free rate. The manager is assumed to choose between two different levels of risk, the choosing of which depends on whether he or she believes the market excess return will be positive. (Cesari & Panetta, 2002)

The formula is:

$$R_{it}-R_{ft} = \alpha_i + \beta_{i0} (R_{mt} - R_{ft}) + \gamma_i [D (R_{mt} - R_{ft})] + \varepsilon \quad (9)$$

When $R_{mt} > R_{ft}$ (up market), D is equal to 1 and when $R_{mt} < R_{ft}$, D is equal to 0.

We can rewrite to formula as:

$$R_{mt} > R_{ft} \qquad R_{it}-R_{ft} = \alpha_i + \gamma_i (R_{mt} - R_{ft}) + \beta_{i1} + \varepsilon \quad (10)$$

$$R_{mt} < R_{ft} \qquad R_{it}-R_{ft} = \alpha_i + \gamma_i (R_{mt} - R_{ft}) + \varepsilon \quad (11)$$

CHAPTER 4

DATA

In this study, equity funds in emerging markets are evaluated. The Investment Company Institute database is used, which offers statistics on major emerging countries'[3] mutual funds as well as developed market mutual funds. Among the emerging market countries, the statistics show ten major economies: namely, China, Brazil, India, Turkey, South Africa, Taiwan, Mexico, Poland, Hungary and Czech Republic as seen in Table 1. However, the China and Brazil mutual fund size is much larger than in the other emerging countries. On the other end of the spectrum, Hungary and Czech Republic are smaller in terms of fund size. Hence, the remaining 6 countries are studied, whose total net assets are between 14 billion USD and 150 billion USD. The IMF ranks these six emerging countries' economies as 10^{th}, 15^{th}, 17^{th}, 24^{th}, 27^{th}, and 33^{rd} for India, Mexico, Turkey, Poland, Taiwan and South Africa, respectively.

There are mainly two types of funds: open-end and close-end funds. In this study, only open-end funds are considered. This study analyzes the performance of equity funds in these six emerging countries. Among mutual funds, equity funds in particular are chosen as these funds carry company stocks, which are riskier and more susceptible to volatility in price.

[3] Because of political problems, financial sanctions and missing data, Russia is not included in this study.

Table 1. Total Net Assets in U.S. Dollars By Type of Fund, 2014: Q3, millions, end period

Region	Total	Equity	Bond	Money Market	Balanced/Mixed	Other
World	31,315,091	13,790,695	7,497,152	4,429,315	3,999,150	1,598,783
Americas	17,818,766	8,566,627	4,276,193	2,756,016	2,088,745	131,185
Europe	9,715,781	3,554,313	2,840,205	1,201,020	1,681,630	438,618
Asia and Pacific	3,636,276	1,635,545	376,251	450,880	157,827	1,015,772
Africa	144,268	34,210	4,503	21,399	70,948	13,207
Brazil	1,064,407	83,325	605,467	52,376	212,007	111,233
China	611,761	175,098	45,507	287,747	94,989	8,420
South Africa	144,268	34,210	4,503	21,399	70,948	13,207
Mexico	133,036	12,842	47,677	55,192	17,325	
India	123,556	38,682	46,268	29,879	2,956	5,771
Taiwan	61,637	17,501	9,670	26,749	1,533	6,185
Poland	26,944	6,978	6,663	7,125	2,104	4,075
Turkey	14,678	464	7,186	5,263	1,333	431
Hungary	11,945	597	4,840	6,059	306	143
Czech Republic	5,363	981	2,693	58	1,630	

Source: This table is taken from http://www.ici.org/research/stats

Table 2 shows the total number of mutual funds in the selected emerging countries. South Africa has the highest number of mutual funds (1,120) and Poland has the lowest number of mutual funds (280). In these emerging markets, performances of those funds either with the highest net asset values or which are managed by largest asset management companies are evaluated. If during the study period a fund was closed, newly established or had merged with another fund, it was omitted. In addition, closed-end funds are disregarded and only open-end funds are evaluated. In the end, 73 equity funds were left to work with.

Table 2. Number of Mutual Funds, end of period

Region	2014		
	Q1	Q2	Q3
World	77,080	78,039	78,949
Europe	34,735	34,917	35,210
Americas	22,289	22,500	22,628
Asia and Pacific	19,003	19,534	19,991
Africa	1,053	1,088	1,120
Brazil	8,285	8,398	8,468
China	1,485	1,587	1,671
South Africa	1,053	1,088	1,120
India	710	725	728
Taiwan	562	564	564
Mexico	486	484	486
Turkey	398	405	400
Poland	267	272	280
Hungary	185	187	188
Czech Republic	84	96	99

Source: This table is taken from http://www.ici.org/research/stats

Table 3 shows the benchmark indices, risk-free rates used, and number of funds analyzed in each of the six emerging countries. The benchmark indices are Borsa Istanbul (BIST100), the Warsaw Stock Exchange (WSE), the Taiwanese Stock Exchange (TWSE), the Johannesburg Stock Exchange (JSE), the National Stock Exchange (CNX500) and the Mexican Stock Exchange (BOLSA). We employed the same risk-free rates that were applied earlier in the literature: 91-Day T-bills for South Africa and Mexico, 364-Day T-bills for India, 3-Month Zloty Deposit Rates for Poland and the TKYD O/N Net Repo Index for Turkey.

Table 3. Mutual Funds Description

Mutual Funds	Number of Mutual Funds	Benchmark	Risk-free Rate
Turkish Equity Funds	11	Borsa Istanbul (BIST100)	TKYD O/N Net Repo Index
Polish Equity Funds	14	Warsaw Stock Exchange (WSE)	3-Month Zloty Deposit Rate
Taiwanese Equity Funds	15	Taiwanese Stock Exchange (TWSE)	1-Month Deposit Rate
South African Equity Funds	10	Johannesburg Stock Exchange (JSE)	91-Day T-bills
Indian Equity Funds	12	National Stock Exchange (CNX500)	364-Day T-bills
Mexican Equity Funds	11	Mexican Stock Exchange (BOLSA)	91-Day T-bills
Total	73		

4.1 Data analysis for Turkey

In this study, the mutual fund performances of 11 Turkish equity funds are analyzed using the Sharpe (1966), Treynor (1965), Jensen's alpha (1968), Sortino (1994) and M^2 (1996) ratios. Jensen's alpha also shows the selectivity skills of fund managers. In order to test mutual fund managers' market timing ability, the Treynor & Mazuy (1966) and Henriksson & Merton (1981) methods are applied. The time period between January 2009 and October 2014, during which quantitative easing (QE) took place, is chosen. Weekly returns of funds are used and 304 weeks are observed for this study. Except for the O/N Net Repo Index, all data are taken from the "Thomson Reuters DataStream." The O/N Net Repo index is taken from the TKYD (Turkish Institutional Investment Managers' Associations).

4.1.1 Selection of equity funds

Mutual funds are categorized into A-type and B-type funds. A-type funds are funds that invest at least 25% of their portfolio in stocks of Turkish companies. There is no such provision for B-type funds to invest in stocks. Since they hold a larger share of stocks in their portfolios, A-type funds have more risk and are more susceptible to stock exchange volatility and price fluctuations. Hence, A-type funds need more

attention. The financial assets of A-type and B-type funds are identified into sixteen different forms. These are: bonds and bills funds, stocks, sector funds, affiliated funds, group funds, foreign currency securities funds, gold and other precious metal funds, variable funds, mixed funds, liquid funds, index funds, fund baskets, guaranteed funds, protected funds, special funds and hedge funds. These fund forms are established as either A-type or B-type, but liquid funds are exclusively B-type.

In Turkey, there are 134 A-type Funds and 316 B-type funds for a total of 450 mutual funds in Turkey based on the data as of October 31, 2014, as shown on Table 4. However, the volume of A-type funds is very low compared to B-type funds. The total net asset value of B-type funds is 33.3 billion TL, whereas A-type funds' total net asset value is approximately 1.9 billion TL. This study evaluates the performance of 11 A-Type equity funds in Turkey. Among the various types of mutual funds, equity funds are chosen as these funds carry company stocks that are riskier and more vulnerable to volatility in price. In total, there are 29 equity funds among the mutual funds. In the study period, funds were neglected if they were closed, newly established or had merged with another fund. Funds that had less than 80% equity shares in their portfolio were also not considered. Subsequently, 11 equity funds were left to work with. Equity shares of selected funds are available in Table 5 and are ranked according to their NAV (net asset value).

Table 4. Number of Mutual Funds in Turkey (10/31/2014)

Fund Type	Fund Number	Net Asset Value (TL)
Mutual Funds		
Total	450	33,311,228,311,37
A-Type Fund	134	1,858,667,718,49
B-Type Fund	316	31,452,560,592,88
A-Type Variable	48	316,786,003,39
A-Type Equity	29	322,734,691,20
A-Type Mixed	21	440,112,919,51
A-Type Sector	1	290,704,50
A-Type Affiliated Fund	2	213,196,322,25
A-Type Special	4	219,253,066,53
A-Type Index	28	337,578,824,22
A-Type Foreign Currency Securities	1	8,715,186,89
A-Type Gold	0	
A-Type Fund Basket	0	
B-Type Variable	85	2,944,469,547,37
B-Type Bond	58	2,300,280,955,44
B-Type Liquid	41	12,238,440,921,11
B-Type Mixed	0	
B-Type Foreign Currency Securities	11	140,748,571,57
B-Type Special	4	363,994,954,61
B-Type Index	5	39,800,239,95
B-Type Gold	13	437,724,294,17
B-Type Fond Basket	7	45,307,461,62
B-Type Guaranteed	20	0

This table is taken from the webpage
http://www.spk.gov.tr/apps/MutualFundsPortfolioValues/index.aspx?type=mkyf&submenuheader=-1

Table 5. Turkish Equity Funds (10/31/2014)

Fund Name	Net Asset Value (TL)	Equity Share (%)
Strateji Securities A Type Equity	33,397,505,58	97,98
İş Bank A Type Equity	26,737,310,30	87,78
Yapı Kredi A Type Equity	22,977,896,51	86,34
Garanti Bank A Type Equity	22,668,867,98	85,13
Akbank A Type Equity	20,509,907,90	93,40
TEB Securities A Type Equity	16,405,151,62	95,53
ING Bank A Type Equity	5,276,436,04	87,44
Finansbank A Type Equity	4,113,148,31	89,69
Alternatif Bank A Type Equity	3,807,278,20	98,03
Eczacıbaşı A Type Equity	3,515,746,59	88,96
Denizbank A Type Equity	1,452,285,58	88,35

This table is taken from the webpage
http://www.spk.gov.tr/apps/MutualFundsPortfolioValues/FundsInfos.aspx?ctype=T&submenuheader=0

4.1.2 Returns on funds

Logarithmic returns on funds were computed over weekly price indices of funds. For the study, 304 weekly data between January 9, 2009 and October 31, 2014 are used.

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

where

R_p = return on the fund

P_t = price of the fund at week t

P_{t-1} = price of the fund at week $t-1$

4.1.3 Benchmark

In this study, the BIST100 price index is used as a benchmark to evaluate whether a fund could outperform the market. Logarithmic weekly returns of the BIST100 are used in the corresponding study period.

$$R_m = ln\ (P_{mt} / P_{mt-1})$$

where

R_m = returns on the BIST100

P_{mt} = value of the BIST100 Price Index on week t

P_{mt-1} = value of the BIST100 Price Index on week t-1

4.1.4 Risk-free rate

The O/N Net Repo Index provided by the TKYD is used as the proxy for the risk-free rate. The TKYD O/N Net Repo Index uses daily value-weighted averages of BIST Repo/Reserve Repo rates as the overnight return. The rate that adds in the withholding tax is multiplied by days to maturity and finally is divided by 365 in order to calculate the daily gross O/N repo index value. The same formulation is used to calculate the net O/N repo index by excluding withholding tax from the overnight return. ("TKYD," n.d.).

$E_t = E_{t-1} * [1+R * \upsilon/365]$

E_t = value of KYD Repo Index on day t

E_{t-1} = value of KYD Repo Index on day t-1

R = average rate of return realized BIST Repo/Reserve Repo Market

υ = maturity of Repo/Reserve Repo agreement

4.2 Data analysis for Poland

In this study, mutual fund performances of 14 Polish equity funds are analyzed using the Sharpe (1966), Treynor (1965), Jensen's alpha (1968), Sortino (1994), M^2 and (1996) ratios. Jensen's alpha also shows the selectivity skills of fund managers. In

order to test mutual fund managers' market timing ability, the Treynor & Mazuy (1966) and Henriksson & Merton (1981) methods are applied. The time period between January 2009 and October 2014, during which quantitative easing (QE) took place, is chosen. Weekly returns of funds are used and 304 weeks are observed for this study. All data are taken from Thomson Reuters DataStream.

4.2.1 Selection of equity funds

In this study, Polish equity funds are analyzed. According to the Chamber of Fund and Asset Management (IZFIA) [4], there are 9 types of funds in Poland, which are: equity funds, mixed funds, bonds funds, cash funds and money market funds, real estate funds, private equity funds, absolute return funds, commodity funds and securitization funds. Among mutual funds, equity funds are chosen as these funds carry company stocks that are riskier and more vulnerable to volatility in price. Among equity funds, we can separate into the following categories: domestic market funds, European market funds, American market funds, Asia and Pacific funds and global funds. This study evaluated only the domestic mutual funds that are invested in Polish company stocks. According to the Investment Company Institute database (2014; Q3), there are 280 mutual funds in Poland. Of these funds, we evaluated only equity funds, which are managed by large asset management companies with a minimum net asset value of one billion zlotys. If a fund was closed, newly established or if it had merged with another fund in the period between January 2009 and October 2014, its performance was not evaluated. Performances of funds that had less than 50% equity shares in their portfolio were also not assessed. Consequently, 14 equity funds were left to work with. The net asset value of

[4] IZFIA is a non-governmental organization that brings together on a voluntary basis all fund management companies operating in Poland.

investment fund companies is available on Table 6 and equity shares of selected equity funds are available on Table 7.

Table 6. Net Asset Value of Investment Fund Companies in Poland

Fund Name	Net Asset Value (Zloty)
PZU TFI[5]	25,340,104,881,61
Pioneer Pekao TFI	16,911,142,069,11
PKO TFI	16,482,825,097,29
Skarbiec TFI	14,798,212,646,99
Aviva Investors Poland TFI	13,240,079,953,69
ING TFI	12,641,847,969,36
BZ WBK TFI	12,483,768,729,35
Union Investment TFI	9,678,482,601,86
Legg Mason TFI	3,360,075,606,98
KBC TFI	3,242,850,988,63
BPH TFI	2,958,691,339,85
Inventum TFI	1,351,153,610,20
MetLife TFI	1,180,590,869,21
TFI SKOK	1,063,973,973,43

This table is taken from http://www.izfa.pl/en/

[5] Towarzystwo Funduszy Investycyjnych (Investment Fund Company)

Table 7. Polish Equity Funds

Fund Name	Equity Share (%)
Arka BZ WBK Akcji	>66%
Aviva Investors Polskich	>60%
BPH FIO Akcji	>70%
ING Akcji	>70%
Inventum Akcji	>60%
KBC Akcyjny	>75%
Legg Mason Akcji	>90%
Metlife Akcji	>66%
Pıoneer Akcji Polskich	>80%
PKO Akcji	>60%
PZU Akcji Krakowiak	>50%
Skarbiec Akcja	>50%
Skok Akcji	>80%
Uni Korona Akcje	>60%

Equity shares are taken from http://www.analizy.pl/fundusze/

4.2.2 Returns of funds

Logarithmic returns of funds were computed over weekly price indices of funds. For the study, 304 weeks of data between January 9, 2009 and October 31, 2014 are used.

4.2.3 Benchmark

In this study, the Warsaw Stock Exchange (*Giełda Papierów Wartościowych w Warszawie)* price index is used to see whether funds outperform the market.

4.2.4 Risk-free rate

In this study, the Polish 3-month zloty deposit rate is used as proxy, sourced from the Thomson Reuters DataStream. Swinkels & Rzezniczak (2009) had previously used the 3-month zloty rate in their study.

4.3 Data analysis for Taiwan

In this study, the mutual fund performances of 15 Taiwanese equity funds are analyzed using the Sharpe (1966), Treynor (1965), Jensen's alpha (1968), Sortino (1994) and M^2 (1996) ratios. Jensen's alpha also shows the selectivity skills of fund managers. In order to test mutual fund managers' market timing ability, the Treynor & Mazuy (1966) and Henriksson & Merton (1981) methods are applied. The time period between January 2009 and October 2014, during which quantitative easing (QE) took place, is chosen. Weekly returns of funds are used and 304 weeks are observed for this study. All data are taken from the Thomson Reuters DataStream.

4.3.1 Selection of equity funds

The asset scale of Taiwan's equity mutual funds had a growth rate of 113.5 percent over the past ten years. The equity mutual fund market in Taiwan still has great potential for growth. However, as an emerging market, it has long been ignored by investors in developed countries (Hsu et al., 2012). Taiwan's mutual fund market has grown nearly ten-fold over the previous two decades in terms of the number of mutual fund firms (Hou, 2012). In comparison to virtually all other markets in Asia, Taiwan has near perfect demographics for the mutual fund industry. There is a large middle-aged, middle class population with high average earnings, a high saving rate and modest pension provision (Citibank Report, 2014).

As seen on Table 8, there are in total 648 mutual funds in Taiwan based on November 2014 data. There are different types of funds: equity, balanced, bond and other funds. In this study, only equity funds are considered and there are in total 342 equity funds, including 154 domestic equity funds and 188 international funds. While the volume of domestic equity funds is 236,513,903,656 Taiwan dollars, the volume

of international equity funds is 299,792,140,133 Taiwan dollars. The study only analyzes the performance of domestic equity funds, which are invested in Taiwanese company stocks. In the study period, a fund was excluded if it was closed, newly established or had merged with another fund. Also, funds whose size was more than 1 billion Taiwan dollars were preferred. In the end, 15 Taiwanese equity funds were selected and are ranked on Table 9 according their fund sizes.

Table 8. Number of Mutual Funds in Taiwan (11/2014)

Fund Type	Number of Funds	Fund Size (TWD)
Domestic Equity Fund	154	236,513,903,656
International Equity Fund	188	299,792,140,133
Subtotal	342	536,306,043,789
Domestic Balanced Fund	25	24,000,371,944
International Balanced Fund	19	44,005,548,190
Subtotal	44	68,005,920,134
Domestic Fixed-Income Fund	1	3,395,610,670
International Fixed-Income Fund	48	74,299,055,958
Financial Asset Securitization Fund	1	330,858,019
High Yield Bond Fund	36	213,513,922,137
Subtotal	86	291,539,446,784
Domestic Money Market Fund	45	844,039,623,010
International Money Market Fund	8	20,082,371,419
Subtotal	53	864,121,994,429
International Fund of Funds - Equity Fund	12	16,188,050,867
International Fund of Funds - Bond Fund	29	63,589,651,139
International Fund of Funds - Balanced Fund	25	61,109,177,448
International Fund of Funds - Others	3	1,085,505,565
Subtotal	69	141,972,385,019
Principal Guaranteed Fund	8	15,311,030,102
Subtotal	8	15,311,030,102
REITs Fund	12	18,076,128,516
Subtotal	12	18,076,128,516
Domestic Exchange Traded Fund	17	87,946,111,084
International Exchange Traded Fund	6	58,991,302,828
Subtotal	23	146,937,413,912
Domestic Index Fund	3	3,139,209,198
International Index Fund	8	8,215,133,356
Total	648	2,093,624,705,239

This table is taken from http://www.sitca.org.tw/ENG/FundInf/FI2001.aspx?PGMID=FI2001

Table 9. Taiwanese Equity Funds (10/31/2014)

Fund Name	Fund Size (Taiwan Dollar)
Prudential Financial High Growth Fund	5,035,760,502
Yuanta Excellence Equity Fund	4,234,062,291
Capital OTC Fund	4,075,238,940
Cathay Cathay Fund	3,775,418,346
Nomura Taiwan Superior Equity Fund	3,111,796,660
HSBC TAIWAN Phoneix Fund	3,101,802,898
Allianz Global Investors Taiwan Fund	3,057,852,230
SinoPac Fund	2,862,141,013
Fuh-Hwa High Growth Fund	2,725,794,332
UPAMC All Weather Fund	2,242,865,487
JPMorgan (Taiwan) Growth Fund	1,870,231,510
PineBridge TAIWAN Giant Fund	1,867,370,812
Fidelity Taiwan Growth Fund	1,577,841,479
Franklin Templeton SinoAm First Fund	1,460.418,340
Jih Sun Fund	1,207,041,244

4.3.2 Returns of funds

Logarithmic returns of funds were computed over weekly price indices of funds. For the study, 304 weeks of data between January 9, 2009 and October 31, 2014 are used.

4.3.3 Benchmark

In this study, the Taiwanese Stock Exchange *(Táiwān Zhèngquàn Jiāoyì Suǒ)* price index is used in order to find whether equity funds surpass the market.

4.3.4 Risk-free rate

In this study, the Taiwan 1-month deposit rate is used as a proxy sourced from Thomson Reuters DataStream. Hou (2012) and Wang & Venezia (2012) used the 1-month deposit rate in their previous studies.

4.4 Data analysis for South Africa

In this study, the mutual fund performances of 10 South African equity funds are analyzed using the Sharpe (1966), Treynor (1965), Jensen's alpha (1968), Sortino (1994) and M^2 (1996) ratios. Jensen's alpha also shows the selectivity skills of fund managers. In order to test mutual fund managers' market timing ability, the Treynor & Mazuy (1966) and Henriksson & Merton (1981) methods are applied. The time period between January 2009 and October 2014, during which quantitative easing (QE) took place, is chosen. Weekly returns of funds are used and 304 weeks are observed for this study. All data are taken from the Thomson Reuters DataStream.

4.4.1 Selection of equity funds

According to the Investment Institute Database (2014:Q3), there are 1,200 mutual funds in South Africa, which has the highest number of mutual funds among selected emerging markets in this study. There are two main funds in South Africa: A Class and R Class funds. A Class funds are open-end while R Class funds are close-end. In this study, R Class funds are ignored. There are different fund types such as equity, bond, balanced, financial, industrial, money markets and real estate funds. Among these types of mutual funds, equity funds are chosen since they carry company stocks that are riskier and more vulnerable to volatility in price. Of these, only equity funds whose net asset values are more than 1 billion South African rand are analyzed. In the study period, funds were disregarded if they were closed, newly established or had merged with another fund. Funds that had less than 50% equity shares in their portfolio were also not considered. In the end, 10 equity funds were chosen for this study; they are shown on Table 10.

Table 10. South African Equity Funds

Fund Name
Old Mutual Investors Fund A
Allan Gray Equity Fund Class A
Sanlam General Equity Fund
Coronation Equity Fund A
Nedgroup Investments Rainmaker Fund A
Foord Equity Fund
Investec Equity A
Aylett Equity Fund
Huysamer Equity Fund A
Prudential Equity Fund

This table is taken from http://www.sharenet.co.za/free/ut.phtml

and http://www.fundsdata.co.za/navs/ZEGN.htm

4.4.2 Returns of funds

When calculating returns of South African funds, weekly returns of the price index of funds are logarithmically computed. For the study, 304 weeks (January 9. 2009-October 31, 2014) are observed.

4.4.3 Benchmark

In this study, the Johannesburg Stock Exchange (JSE) price index is used to find whether or not mutual funds beat the market.

4.4.4 Risk-free rate

In this study, South African 91-Day T-bills are selected as the appropriate risk-free rate and are sourced from the Thomson Reuters DataStream. Manjezi (2008) previously used this risk-free rate in his study.

4.5 Data analysis for India

In this study, mutual fund performances of 12 Indian equity funds are analyzed using the Sharpe (1966), Treynor (1965), Jensen's alpha (1968), Sortino (1994) and M^2

(1996) ratios. Jensen's alpha also shows the selectivity skills of fund managers. In order to test mutual fund managers' market timing ability, the Treynor & Mazuy (1966) and Henriksson & Merton (1981) methods are applied. The time period between January 2009 and October 2014, during which quantitative easing (QE) took place, is chosen. Weekly returns of funds are used and 304 weeks are observed for this study. All data are taken from the Thomson Reuters DataStream.

4.5.1 Selection of equity funds

According to the Investment Institute Database (2014:Q3), there are 728 mutual funds in India. Indian mutual funds have different types of mutual fund schemes such as open-ended, close ended, interval (based on structure), growth/equity, income, balanced and money market schemes (based on investment objectives). There are also other schemes such as tax saving schemes, special schemes that provide the needs of the financial position, risk tolerance and return expectations (Duggimpudi et al., 2010). In this study, only growth/equity funds are considered because they carry risk and should be invested with at least 65% equity or equity-related securities. Of these funds, only equity funds that are managed by the largest asset management companies and have a net asset value of more than 1 billion rupees are analyzed. In the study period, it was disregarded if a fund was closed, newly established or had merged with another fund. Funds that had less than 65% equity shares in their portfolio were also not considered. In total, 12 equity funds were left to work with. Tables 11 and 12 show the net asset value of investment fund companies and the equity shares of the selected funds, respectively.

Table 11. Net Asset Value of Investment Fund Companies in India

Mutual Fund Company	Assets Under Management (rupee)
HDFC Mutual Fund	14.183.476.070
ICICI Prudential Mutual Fund	12.776.072.850
Reliance Mutual Fund	12.338.634.120
Birla Sun Life Mutual Fund	10.269.015.040
UTI Mutual Fund	8.324.991.040
SBI Mutual Fund	7.353.032.480
IDFC Mutual Fund	4.585.077.130
DSP BlackRock	3.865.156.590
Tata Mutual Fund	2.454.383.580
L & T Mutual Fund	2.067.270.560
Sundaram Mutual	1.894.355.510
Religare Invesco Mutual Fund	1.766.735.330

This table is taken and amended from https://www.baanmoney.com/mutual_funds/rankings and https://www.amfiindia.com/net-asset-value

Table 12. Indian Equity Funds

Fund Name
ICICI Prudentıal Dynamic Plan Growth
UTI Equity Fund-Growth
Religare Invesco Growth Fund
L&T Equity Growth
HDFC Equity Growth
DSP Blackrock Equity Growth
SBI Magnum Equity Growth
Reliance Growth Fund
Tata Pure Equity Growth
Birla Sun Life Equity Growth
IDFC Equity Fund
Sundaram Growth Fund

4.5.2 Returns of funds

When calculating returns of Indian funds, the weekly returns of the price index of funds are logarithmically computed. For the study, 304 weeks (January 9, 2009 - October 31, 2014) are observed.

4.5.3 Benchmark

In this study, the CNX500[6] price index is used as a benchmark. A weekly return of the CNX500 is used.

4.5.4 Risk-free rate

In this study, 364-Day T-bills are used as a risk-free rate and are sourced from the Thomson Reuters DataStream. Prajapati & Patel (2012) used the same measures in their studies.

4.6 Data Analysis for Mexico

In this study, the mutual fund performances of 11 Mexican equity funds are analyzed using the Sharpe (1966), Treynor (1965), Jensen's alpha (1968), Sortino (1994) and M^2 (1996) ratios. Jensen's alpha also shows the selectivity skills of fund managers. In order to test mutual fund managers' market timing ability, the Treynor & Mazuy (1966) and Henriksson & Merton (1981) methods are applied. The time period between January 2009 and October 2014, during which quantitative easing (QE) took place, is chosen. Weekly returns of funds are used and 304 weeks are observed for this study. All data are taken from the Thomson Reuters DataStream.

4.6.1 Selection of equity funds

In this study, Mexican equity funds are analyzed. According to the data of the Investment Company Institute (2014;Q3), there are 486 equity funds in Mexico. There are four general types of funds in Mexico according to the PLC- investment fund report[7]: equity investment funds, debt instrument funds, capital investment

[6] The CNX Index represents about 96.42% of the free float market capitalization of the stocks listed on the National Stock Exchange on June 30, 2014. http://www.nse-india.com/

[7] http://www.vonwobeserysierra.com/assets/files/PDF/marzo2013_/7_PLC_Investment_Funds.pdf

funds, and special purpose funds. In this study, only equity investment funds are chosen because these funds carry company stocks that are riskier and more vulnerable to volatility in price. Of these funds, equity funds that are managed by large asset management companies with a minimum net asset value of one billion Mexican pesos are analyzed. If a fund was closed, newly established or if it had merged with another fund over the period between January 2009 and October 2014, its performance was not evaluated. Performances of funds that had less than 50% equity shares in their portfolio were also not assessed. In the end, 11 equity funds were left to work with. Equity shares of the selected equity funds are shown on Table 13.

Table 13. Mexican Equity Funds

Fund Name	Equity Share (%)
Actipatrimonial SA DE CV	> 50%
Activariable SA DE CV SIRV	> 50%
Apolo Indizado SA DE CV SIRV	> 50%
BBVA Bancomer Patriominial SA CV	> 50%
Citiacciones Patrimonial SA DE CV SIRV	> 50%
GBM Fondo de Inversion Modelo SA DE CV SIRV	> 50%
IXE Comun SA DE CV SIRV	> 50%
Norteselectivo SA DE CV	> 50%
Principal RV A1 SA DE CV SIRV	> 50%
Santander Indizado SA DE CV SIRV	> 50%
Sura Patrimonial SA DE CV SIRV	> 50%

4.6.2 Returns of funds

When calculating returns of Mexican funds, the weekly returns of the price index of funds are logarithmically computed. For the study, 304 weeks (January 9, 2009 October 31, 2014) are observed.

4.6.3 Benchmark

In this study, the Mexican Stock Exchange *(Bolsa Mexicana de Valore)* price index is used to find whether mutual funds outperformed the market. The weekly returns of BOLSA are used and calculated.

4.6.4 Risk-free rate

In this study, 91-Day Government Treasury Bills are chosen for the risk-free rate. This data is taken from the Thomson Reuters Datastream.

CHAPTER 5

RESULTS AND ANALYSIS

5.1 Results and analysis of Turkish funds

5.1.1 Descriptive statistics for Turkish funds

The descriptive statistics of Turkish equity funds, benchmarks and risk-free rates are given in Table 14. The Average column indicates the returns on funds, benchmarks and the risk-free rate. When comparing the average returns, the Strateji Securities A-Type Equity Fund, the Finansbank A-Type Equity Fund, the Alternatifbank A-Type Equity Fund and the TEB Securities A-Type Equity Fund are higher than the BIST100 indices. The Skew column displays the skewing of equity funds and the corresponding value of their benchmark. All funds and benchmarks that have negative skews denote a distribution with an asymmetric tail extending toward more negative values. Only the O/N Net Repo Index has a positive skew, which indicates a distribution with an asymmetric tail extending toward more positive values. All funds, benchmarks and risk-free rates have positive kurtoses, which infers typical heavy tailed financial distributions. The R column depicts the correlation between funds and benchmarks. The average correlation of funds and their benchmark is 0.89148, which implies that there is a strong positive correlation. The İş Bank A-Type Equity Fund has the highest correlation (0.97476) and Alternatif Bank has the lowest correlation (0.79151) when funds are compared individually. The last column exhibits betas of equity funds, which measure the systematic risks of the funds. All funds' betas are less than 1, thereby implying that all 14 of these funds to carry less risk compared to the benchmark BIST100 index. The Standard Deviation column shows the volatility of equity funds, benchmarks and risk-free rates. The BIST100

has the highest standard deviation while the Strateji Securities A-Type Equity Fund and the TEB Securities A-Type Equity Fund follow the BIST100. Risk and return of the benchmark is higher than the equities. On the other hand, the O/N Net Repo Index has the lowest standard deviation, as expected.

Table 14. Descriptive Statistics of Turkish Equity Funds

Fund Name	Average	Skew	Kurtosis	R	Std. dev	Beta
Akbank A-Type Equity	0.00322	-0.51769	0.52677	0.97104	0.02845	0.80254
Alternatif Bank A-Type Equity	0.00379	-0.95453	2.34903	0.79151	0.02112	0.48559
Denizbank A-Type Equity	0.00276	-0.51916	0.74667	0.92113	0.02651	0.70948
Eczacıbaşı A-Type Equity	0.00312	-0.33986	0.26195	0.95554	0.02512	0.69722
Finansbank A-Type Equity	0.00436	-0.34476	0.56318	0.96300	0.03176	0.88849
Garanti Bank A-Type Equity	0.00269	-0.45649	0.58373	0.95846	0.03066	0.85360
ING Bank A-Type Equity	0.00346	-0.56039	0.86038	0.92824	0.02535	0.68339
İş Bank A-Type Equity	0.00255	-0.44690	0.36338	0.97476	0.02808	0.79523
Strateji Securities A-Type Equity	0.00608	-0.83594	1.55241	0.87873	0.03396	0.86678
TEB Securities A-Type Equity	0.00374	-0.50012	0.62906	0.97497	0.03265	0.92489
Yapı Kredi A-Type Equity	0.00276	-0.51916	0.74667	0.92113	0.02759	0.78032
BIST100	0.00360	-0.46156	0.61091		0.03441	
O/N NET REPO INDEX	0.00121	0.52818	0.22331		0.00036	

5.1.2 Results of the Sharpe ratio for Turkey

Table 15 shows the performance of the Sharpe ratio. The higher the Sharpe ratio the more return the investor is getting per unit of risk. The lower the Sharpe ratio, the more risk the investor is carrying to earn additional returns. A higher Sharpe ratio implies that funds have a better performance. The Strateji Securities A-Type Equity Fund, the Alternatif Bank A-Type Equity Fund and the Finansbank A-Type Equity Fund have the highest performances for the Sharpe ratio. The performances of the İş Bank A-Type Equity Fund, the Garanti Bank A-Type Equity Fund and the Denizbank A-Type Equity Fund have the lowest performances for the Sharpe ratio.

Table 15: Results of the Sharpe Ratio for Turkey

Fund Name	Sharpe	Rank
Strateji Securities A-Type Equity Fund	0.14320	1
Alternatif Bank A-Type Equity Fund	0.12187	2
Finansbank A-Type Equity Fund	0.09894	3
ING Bank A-Type Equity Fund	0.08862	4
Yapı Kredi A-Type Equity Fund	0.07903	5
TEB Securities A-Type Equity Fund	0.07751	6
Eczacıbaşı A-Type Equity Fund	0.07592	7
Akbank A-Type Equity Fund	0.07073	8
Denizbank A-Type Equity Fund	0.05839	9
Garanti Bank A-Type Equity Fund	0.04824	10
İş Bank A-Type Equity Fund	0.04749	11

5.1.3 Results of the Treynor ratio for Turkey

Table 16 shows the performance of the Treynor ratio. A fund with a higher Treynor ratio indicates that the fund has a better risk-adjusted return compared to a fund with a lower Treynor ratio. A higher Treynor ratio implies that funds have better performances. The Strateji Securities A-Type Equity Fund, the Alternatif Bank A-Type Equity Fund and the Finansbank A-Type Equity Fund have the highest performances for the Treynor ratio. The İş Bank A-Type Equity Fund, the Garanti Bank A-Type Equity Fund and the Denizbank A-Type Equity Fund have the lowest performance for the Treynor ratio.

Table 16. Results of the Treynor Ratio for Turkey

Fund Name	Treynor	Rank
Strateji Securities A-Type Equity Fund	0.00561	1
Alternatif Bank A-Type Equity Fund	0.00530	2
Finansbank A-Type Equity Fund	0.00354	3
ING Bank A-Type Equity Fund	0.00329	4
Yapı Kredi A-Type Equity Fund	0.00279	5
Eczacıbaşı A-Type Equity Fund	0.00274	6
TEB Securities A-Type Equity Fund	0.00274	7
Akbank A-Type Equity Fund	0.00251	8
Denizbank A-Type Equity Fund	0.00218	9
Garanti Bank A-Type Equity Fund	0.00173	10
İş Bank A-Type Equity Fund	0.00168	11

5.1.4 Results of Jensen's alpha for Turkey

Table 17 shows us the results of Jensen's alpha measure that indicates the selectivity skills of fund managers. Fund managers have either a higher performance or a lower performance relative to the market. Eight of the 11 funds have positive alphas, but only two of these are statistically significant. Akbank, Alternatif Bank, Eczacıbaşı, Finansbank, ING Bank, Strateji Securities, TEB Securities and Yapı Kredi have positive alphas. Among them, the Strateji Securities A-Type Equity Fund is statistically significant at the 1% level and the Finansbank A-Type Equity Fund is statistically significant at the 5% level. It is inferred that these 2 funds' managers have selective ability. On the other hand, the Denizbank A-Type Equity Fund, the Garanti Bank A-Type Equity Fund and the İş Bank A-Type Equity Fund have negative alphas. It is interpreted that these funds' managers do not have selectivity skills.

Table 17. Results of Jensen's Alpha for Turkey

Fund Name	alpha	t-stat	p-value
Strateji Securities A-Type Equity***	0.00279	2.99688	0.00295
Finansbank A-Type Equity**	0.00102	2.07990	0.03838
Alternatif Bank A-Type Equity	0.00083	1.11199	0.26703
ING Bank A-Type Equity	0.00062	1.13838	0.25587
TEB Securities A-Type Equity	000033	0.78113	0.43534
Yapı Kredi A-Type Equity	0.00032	0.88459	0.37708
Eczacıbaşı A-Type Equity	0.00025	0.5757	0.56525
Akbank A-Type Equity	0.00010	0.25434	0.79941
Denizbank A-Type Equity	-0.00014	-0.24078	0.80989
Garanti Bank A-Type Equity	-0.00056	-1.10390	0.27052
İş Bank A-Type Equity	-0.00056	-1.55686	0.12055

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.1.5 Results of the Sortino ratio for Turkey

The Sortino ratio has to do with returns that decrease below a user-specific minimum or the required rate of return (minimum accepted return, or MAR). In other words, it measures the excess return against the risk of not meeting the minimum return. A high Sortino ratio is better than a low Sortino ratio because a high Sortino ratio denotes low downside volatility compared to the expected return. Table 18 shows results of the Sortino ratio. The Srateji Securities A-Type Equity Fund, the Alternatif Bank A-Type Equity Fund and the Finansbank A-Type Equity Fund have the highest Sortino ratios. On the other hand, the İş Bank A-Type Equity Fund, the Garanti Bank A-Type Equity Fund and the Denizbank A-Type Equity Fund have the lowest Sortino ratios.

Table 18. Results of the Sortino Ratio for Turkey

Fund Name	Sortino	Rank
Strateji Securities A-Type Equity	0.02616	1
Alternatif Bank A-Type Equity	0.02234	2
Finansbank A-Type Equity	0.01672	3
ING Bank A-Type Equity	0.01468	4
Yapı Kredi A-Type Equity	0.01282	5
TEB Securities A-Type Equity	0.01263	6
Eczacıbaşı A-Type Equity	0.01207	7
Akbank A-Type Equity	0.01144	8
Denizbank A-Type Equity	0.00937	9
Garanti Bank A-Type Equity	0.00758	10
İş Bank A-Type Equity	0.00742	11

5.1.6 Results of the M^2 (Modigliani & Modigliani) ratio for Turkey

Table 19 displays results of the M^2 measure. Higher M^2 implies that funds have a better performance. The ING Bank A-Type Equity Fund, the Strateji Securities A-Type Equity Fund, the Alternatif Bank A-Type Equity Fund and the Finansbank A-Type Equity Fund have the highest M^2 performances, whereas the İş Bank A-Type Equity Fund, the Garanti Bank A-Type Equity Fund and the Denizbank A-Type Equity Fund have the lowest M^2 performances.

Table 19. Results of M^2 Ratio for Turkey

Fund Name	M^2	Rank
ING Bank A-Type Equity	0.02473	1
Strateji Securities A-Type Equity	0.00614	2
Alternatif Bank A-Type Equity	0.00541	3
Finansbank A-Type Equity	0.00462	4
Yapı Kredi A-Type Equity	0.00393	5
TEB Securities A-Type Equity	0.00388	6
Eczacıbaşı A-Type Equity	0.00383	7
Akbank A-Type Equity	0.00365	8
Denizbank A-Type Equity	0.00322	9
Garanti Bank A-Type Equity	0.00287	10
İş Bank A-Type Equity	0.00285	11

5.1.7 Results of the Treynor & Mazuy regression analysis for Turkey

The Treynor & Mazuy (1966) analysis analyzes the market timing ability of fund managers. If fund managers believe that the market is going up, they change their portfolio composition from less volatile to high volatile securities. When the market is going down, they shift their portfolio composition from high volatile to less volatile securities. If fund managers have market timing ability, they create their portfolios according to their estimates of the tendency of the markets. Table 20 shows the results of the Treynor & Mazuy (1966) method. Five funds – Eczacıbaşı, Finansbank, Garanti Bank, İş Bank and Yapı Kredi – have positive market timing ability, but only the Eczacıbaşı A-Type Equity Fund is both positive and statistically significant at the 10% level. On the other hand, six funds have negative market timing ability and three of them are statistically significant. The Alternatif Bank A-Type Equity Fund and the Strateji Securities A-Type Fund are statistically significant at the 1% level and the ING Bank A-Type Equity Fund is statistically significant at the 5% level. It can be concluded that fund managers did not have market timing ability during the quantitative easing policy era.

Table 20. Results of the Treynor & Mazuy Regression Analysis for Turkey

Fund Name	T & M	t-stat	p-value
Finansbank A-Type Equity	0.41998	1.58914	0.11308
Eczacıbaşı A-Type Equity*	0.41561	1.82174	0.06948
Yapı Kredi A-Type Equity	0.1927	0.98799	0.32395
Garanti Bank A-Type Equity	0.04925	0.18167	0.85597
Is Bank A-Type Equity	0.00226	0.01163	0.99073
TEB Securities A-Type Equity	-0.22919	-1.01995	0.30857
Akbank A-Type Equity	-0.27842	-1.32569	0.18594
Denizbank A-Type Equity	-0.38133	-1.19457	0.23319
ING Bank A-Type Equity**	-0.58057	-2.00050	0.04634
Alternatif Bank A-Type Equity***	-2.11741	-5.55927	0.00000
Strateji Securities A-Type Equity***	-2.16151	-4.43807	0.00001

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.1.8 Results of the Henriksson & Merton regression analysis for Turkey

Another approach for market timing ability is the Henriksson & Merton (1984) regression analysis method. Market timing ability allows fund managers to forecast whether returns of funds will be higher than the risk-free rate or vice versa. Table 21 shows the results of the Henriksson & Merton (1981) method. According to the results, five funds – the Eczacıbaşı A-Type Equity Fund, the Finansbank A-Type Equity Fund, the Garanti Bank A-Type Equity Fund, the İş Bank A-Type Equity Fund and the Yapı Kredi A-Type Equity Fund – have positive market timing ability but none of them are statistically significant. The other six funds have negative market timing ability. Of these funds, two are statistically significant: the Alternatif Bank A-Type Equity Fund is statistically significant at the 1% level and the Strateji Securities A-Type Equity Fund is statistically significant at the 5% level.

Table 21. Results of the Henriksson & Merton Regression Analysis for Turkey

Fund Name	H & M	t-stat	p-value
Garanti Bank A-Type Equity	0.04925	0.18167	0.85597
Finansbank A-Type Equity	0.02421	0.94958	0.34309
Eczacıbaşı A-Type Equity	0.01348	0.61110	0.54160
Yapı Kredi A-Type Equity	0.00409	0.21767	0.82783
Is Bank A-Type Equity	0.00226	0.01163	0.99073
Akbank A-Type Equity	-0.01975	-0.97624	0.32973
Denizbank A-Type Equity	-0.02914	-0.94797	0.34390
ING Bank A-Type Equity	-0.03005	-1.07102	0.28502
Alternatif Bank A-Type Equity***	-0.10815	-2.84847	0.00469
Strateji Securities A-Type Equity**	-0.11868	-2.47884	0.01373
TEB Securities A-Type Equity	-0.22919	-1.01995	0.30857

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.2 Results and analysis of Polish funds

5.2.1 Descriptive statistics for Polish funds

Descriptive statistics of Polish equity funds, benchmarks and risk-free rates are given in Table 22. The Average column indicates the returns of funds, benchmarks and risk-free rates. When comparing average returns, the Warsaw Stock Exchange is higher than all equity funds, so the WSE beats all funds during the quantitative easing era. All funds have positive returns, but only Inventum Akcji has negative returns. The Skew column displays the skew of equity funds and the corresponding value of their benchmarks. All funds, benchmarks and 3-month deposit rates are negatively skewed, denoting a distribution with an asymmetric tail extending toward more negative values. All funds and benchmarks have positive kurtoses, which implies typical heavy tailed financial distributions. The risk-free rate has negative kurtosis, which implies a relatively flat distribution. The R column shows the correlation between funds and their benchmarks. The average correlation of funds and their benchmark is 0.93650, which implies that there is a strong positive correlation. Metlife Akcji has the highest correlation (0.98935) and Inventum Akcji has the lowest correlation (0.62603) when funds are compared individually. The Standard Deviation column shows the volatility of equity funds, benchmarks and risk-free rates. Standard deviation of Inventum Akcji, Pioneer Akcji Polskich and KBC Akcyjny are higher than the WSE, while on the other side 3-month deposit rate has the lowest standard deviation. The last column exhibits the betas of equity funds, which measure the systematic risks of the funds. Except KBC Akcyjny. All funds' betas are less than 1, thereby indicating that all thirteen funds carry less risk compared to the benchmark WSE index.

Table 22. Descriptive Statistics of Polish Equity Funds

Fund Name	Average	Skew	Kurtosis	R	Std. dev.	Beta
Arka BZ WBK Akcji	0.00127	-0.84359	2.84480	0.90655	0.01999	0.84871
Aviva Investors Polskich	0.00211	-1.01443	3.78538	0.95153	0.02344	0.87064
BPH FIO Akcji	0.00138	-0.59702	2.10657	0.97380	0.02337	0.88812
ING Akcji	0.00159	-0.78437	2.75429	0,98535	0.02406	0.92530
Inventum Akcji	-0.00134	-1.79760	7.75138	0.62603	0.02755	0.67408
KBC Akcyjny	0.00209	-0.65787	2.02407	0.98152	0.02634	1.00885
Legg Mason Akcji	0.00171	-0.77361	2.20085	0.97457	0.02084	0.79285
Metlife Akcji	0.00110	-0.62918	2.01015	0.98935	0.02436	0.94052
Pioneer Akcji Polskich	0.00020	-0.89668	4.12864	0.95462	0.02647	0.98641
PKO Akcji	0.00139	-0.99069	3.23915	0.95671	0.01944	0.72593
PZU Akcji Krakowiak	0.00100	-0.79964	2.21045	0.98044	0.02415	0.92401
Skarbiec Akcja	0.00114	-0.78014	2.04972	0.94864	0.02416	0.89441
Skok Akcji	0.00176	-0.52696	1.75195	0.97530	0.02238	0.85181
Uni Korona Akcje	0.00207	-0.64951	1.77195	0.90653	0.02417	0.85508
Warsaw Stock Exchange	0.00225	-0.58838	2.11744		0.02562	
3M Deposit Rate	0.00072	-0.43197	-0.98126		0.00016	

5.2.2 Results of the Sharpe ratio for Poland

Table 23 shows the performance of the Sharpe ratio. The higher the Sharpe ratio the more return the investor is getting per unit of risk. The lower the Sharpe ratio, the more risk the investor is carrying to earn additional returns. A higher Sharpe ratio implies that funds have a better performance. Aviva Investors Polskich, Uni Korona Akcje and KBC Akcyjny have the highest Sharpe ratios. Inventum Akcji, Pioneer Akcji Polskich and PZU Akcji have the lowest Sharpe ratio performances.

Table 23. Results of the Sharpe Ratio for Poland

Fund Name	Sharpe	Rank
Aviva Investors Polskich	0.05942	1
Uni Korona Akcje	0.05601	2
KBC Akcyjny	0.05199	3
Legg Mason Akcji	0.04779	4
Skok Akcji	0.04640	5
ING Akcji	0.03628	6
PKO Akcji FIO	0.03473	7
BPH FIO Akcji	0.02832	8
Arka BZ WBK Akcji	0.02360	9
Skarbiec Akcja FIO	0.01730	10
Metlife Akcji	0.01575	11
PZU Akcji Krakowiak	0.01165	12
Pioneer Akcji Polskich	-0.01952	13
Inventum Akcji	-0.07462	14

5.2.3 Results of the Treynor ratio for Poland

Table 24 shows the performance of the Treynor ratio. A fund with a higher Treynor ratio indicates that the fund has a better risk-adjusted return than a fund with a lower Treynor ratio. A higher Treynor ratio implies that funds have a better performance. Aviva Investors Polskich, Uni Korona Akcje and KBC Akcyjny have the highest Treynor ratios, whereas Inventum Akcji, Pioneer Akcji Polskich and PZU Akcji have the lowest Treynor ratio performances.

Table 24. Results of the Treynor Ratio for Poland

Fund Name	Treynor	Rank
Aviva Investors Polskich	0.00160	1
Uni Korona Akcje	0.00158	2
KBC Akcyjny	0.00136	3
Legg Mason Akcji	0.00126	4
Skok Akcji	0.00122	5
ING Akcji	0.00094	6
PKO Akcji FIO	0.00093	7
BPH FIO Akcji	0.00075	8
Arka BZ WBK Akcji	0.00065	9
Skarbiec Akcja FIO	0.00047	10
Metlife Akcji	0.00041	11
PZU Akcji Krakowiak	0.00030	12
Pioneer Akcji Polskich	-0.00052	13
Inventum Akcji	-0.00305	14

5.2.4 Results of Jensen's alpha for Poland

Table 25 shows the results of Jensen's alpha measure that indicates the selectivity skills of fund managers. Fund managers have either a higher performance or a lower performance relative to the market. Two of the 11 funds have positive alphas, but none of them are statistically significant. The other 12 funds have negative alphas and among them, seven funds are statistically significant: ING Akcji, BPH FIO Akcji, Skarbiec Akcja, Inventum Akcji are statistically significant at the 5% level while Metlife Akcji, PZU Akcji Krakowiak, Pioneer Akcji Polskich are statistically significant at the 1% level. It is interpreted that these funds' managers did not possess selectivity skills during the quantitative easing era.

Table 25. Results of Jensen's alpha for Poland

Fund Name	alpha	t-stat	p-value
Aviva Investors Polskich	0.00006	0.14453	0.88518
Uni Korona Akcje	0.00004	0.07603	0.93945
KBC Akcyjny	-0.00018	-0.60421	0.54616
Legg Mason Akcji	-0.00022	-0.81022	0.41845
Skok Akcji	-0.00027	-0.93422	0.35094
PKO Akcji	-0.00044	-1.33933	0.18147
ING Akcji**	-0.00054	-2.30170	0.02203
BPH FIO Akcji**	-0.00070	-2.28206	0.02318
Arka BZ WBK Akcji	-0.00075	-1.47603	0.14098
Skarbiec Akcja**	-0.00095	-2.16295	0.03133
Metlife Akcji***	-0.00106	-5.17564	0.00000
PZU Akcji Krakowiak***	-0.00113	-4.14275	0.00004
Pioneer Akcji Polskich***	-0.00203	-4.46716	0.00001
Inventum Akcji**	-0.00309	-2.49630	0.01308

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.2.5 Results of the Sortino ratio for Poland

The Sortino ratio has to do with returns that decrease below a user-specific minimum or the required rate of return (minimum accepted return, or MAR). In other words, it measures the excess return against the risk of not meeting the minimum return. A high Sortino ratio is better than a low Sortino ratio because a high Sortino ratio denotes low downside volatility compared to the expected return. Table 26 displays the results of the Sortino ratios. While Aviva Investors Polskich, Uni Korona Akcje and KBC Akcyjny have the highest Sortino ratios, Inventum Akcji, Pioneer Akcji Polskich and PZU Akcji have the lowest Sortino ratio performances.

Table 26. Results of the Sortino Ratio for Poland

Fund Name	Sortino	Rank
Aviva Investors Polskich	0.01047	1
Uni Korona Akcje	0.00930	2
KBC Akcyjny	0.00866	3
Legg Mason Akcji	0.00783	4
Skok Akcji	0.00766	5
ING Akcji	0.00599	6
PKO Akcji	0.00578	7
BPH FIO Akcji	0.00454	8
Arka BZ WBK Akcji	0.00380	9
Skarbiec Akcja	0.00274	10
Metlife Akcji	0.00254	11
PZU Akcji Krakowiak	0.00186	12
Pioneer Akcji Polskich	-0.00314	13
Inventum Akcji	-0.01173	14

5.2.6 Results of the M^2 (Modigliani & Modigliani) ratio for Poland

Table 27 indicates results of the M^2 measure. Higher M^2 implies that funds have better performances. Aviva Investors Polskich, Uni Korona Akcje and KBC Akcyjny have the highest M^2 ratios. Inventum Akcji, Pioneer Akcji Polskich and PZU Akcji have the lowest M^2 ratio performancess.

Table 27. Results of the M^2 Ratio for Poland

Fund Name	M^2	Rank
Aviva Investors Polskich	0.00224	1
Uni Korona Akcje	0.00215	2
KBC Akcyjny	0.00205	3
Legg Mason Akcji	0.00194	4
Skok Akcji	0.00191	5
ING Akcji	0.00165	6
PKO Akcjı FIO	0.00161	7
BPH FIO Akcji	0.00144	8
Arka BZ WBK Akcji	0.00132	9
Skarbiec Akcja FIO	0.00116	10
Metlife Akcji	0.00112	11
PZU Akcji Krakowiak	0.00102	12
Pioneer Akcji Polskich	0.00022	13
Inventum Akcji	-0.00119	14

5.2.7 Results of the Treynor & Mazuy regression analysis for Poland

The Treynor & Mazuy (1966) analysis analyzes the market timing ability of fund managers. If fund managers believe that the market is going up, they change their portfolio composition from less volatile to high volatile securities. When the market is going down, they shift their portfolio composition from high volatile to less volatile securities. If fund managers have market timing ability, they create their portfolios according to their estimates of the tendency of the markets. Table 28 denotes the results of the Treynor & Mazuy (1966) method. Two funds, PKO Akcji and Skok Akcji have positive market timing ability, but this is statistically insignificant. Meanwhile, 12 funds have a negative market timing ability and 9 of them are statistically significant. KBC Akcyjny is statistically significant at the 10% level while Pioneer Akcji Polskich, Uni Korona Akcje and Skarbiec Akcja are statistically significant at the 5% level. Meanwhile, PZU Akcji Krakowiak, ING

Akcji, Legg Mason Akcji, Aviva Investors Polskich and Arka BZ WBK Akcji are statistically significant at the 1% level.

Table 28. Results of the Treynor & Mazuy Regression Analysis for Poland

Fund Name	T & M	t-stat	p-value
PKO Akcjı FIO	0.24704	1.35659	0.17592
Skok Akcji	0.03504	0.16035	0.87272
Metlife Akcji	-0.13506	-0.86272	0.38898
BPH FIO Akcji	-0.26813	-1.14386	0.25359
KBC Akcyjny*	-0.41770	-1.88584	0.06028
PZU Akcji Krakowiak***	-0.58636	-2.82756	0.00500
ING Akcji***	-0.71966	-4.07435	0.00006
Legg Mason Akcji***	-0.72468	-3.58331	0.00040
Pioneer Akcji Polskich**	-0.73981	-2.13899	0.03324
Uni Korona Akcje**	-0.92958	-2.07586	0.03875
Skarbiec Akcja**	-1.22556	-3.70959	0.00025
Aviva Investors Polskich***	-1.32811	-4.29209	0.00002
Inventum Akcji	-1.53016	-1.61733	0.10685
Arka BZ WBK Akcji***	-1.55267	-4.11045	0.00005

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.2.8 Results of Henriksson & Merton regression analysis for Poland

Another approach for market timing ability is the Henriksson & Merton (1984) regression analysis method. Market timing ability allows fund managers to forecast whether returns of funds will be higher than the risk-free rate or vice versa. Table 29 shows the results of Henriksson & Merton (1981) method. According to the results, only one fund has positive market timing ability but it is statistically insignificant. Thirteen funds have a negative market timing ability with ING Akcji, PZU Akcji Krakowiak and Arka BZ WBK Akcji statistically significant at the 10% level while Legg Mason Akcji, Aviva Investors Polskich and Skarbiec Akcji are statistically significant at the 5% level.

Table 29. Results of the Henriksson & Merton Regression Analysis for Poland

Fund Name	H & M	t-stat	p-value
Skok Akcji	0.00001	0.00032	0.99974
PKO Akcji FIO	-0.00566	-0.33897	0.73487
BPH FIO Akcji	-0.00671	-0.32177	0.74785
Metlife Akcji	-0.01195	-0.85895	0.39105
KBC Akcyjny	-0.02189	-1.10828	0.26862
ING Akcji*	-0.03087	-1.92697	0.05492
PZU Akcji Krakowiak*	-0.03279	-1.76556	0.07848
Legg Mason Akcji**	-0.03681	-2.02001	0.04426
Pioneer Akcji Polskich	-0.03703	-1.19884	0.23153
Uni Korona Akcje	-0.04236	-1.05915	0.29038
Inventum Akcji	-0.05026	-0.59573	0.55180
Skarbiec Akcja**	-0.05978	-2.00479	0.04588
Aviva Investors Polskich**	-0.06613	-2.35651	0.01909
Arka BZ WBK Akcji*	-0.06979	-2.03758	0.04246

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.3 Results and analysis of Taiwanese funds

5.3.1 Descriptive statistics for Taiwanese funds

Descriptive statistics of Taiwanese equity funds, benchmarks and risk-free rates are given in Table 30. The Average column indicates returns on funds, benchmarks and risk-free rates. The average returns of the Allianz Global Investors Taiwan Fund, the Capital OTC Fund, the Cathay Fund, the Franklin Templeton Sino Am First Fund, the Fuh Hwa High Growth Fund, the Nomura Taiwan Superior Equity Fund, the Pine Bridge Taiwan Giant Fund, the Prudential Financial High Growth Fund, the Sino Pac Fund, and the UPAMC All Weather Fund are higher than the Taiwan Stock Exchange (TWSE). Taiwanese funds, in general, show better performances during the quantitative easing era. The Skew column displays the skew of equity funds and the corresponding value of their benchmarks. All funds, benchmarks and 1-month deposit rates are negatively skewed meaning that a distribution with an asymmetric

tail extending toward more negative values is present. All funds and benchmarks have positive kurtoses, which imply typical heavy tailed financial distributions and risk-free rate has negative kurtosis, which implies a relatively flat distribution. The R column shows a correlation between funds and benchmarks. The average correlation of funds and their benchmarks is 0.89363, which implies that there is a strong positive correlation. When funds are compared individually, HSBC Taiwan Phoenix Fund has the highest correlation (0.97244) and Pine Bridge Taiwan Giant Fund has the lowest correlation (0.82290). The Standard Deviation column shows the volatility of equity funds, benchmarks and risk-free rates. Other than the Yuanta Excellence Equity Fund and the HSBC Taiwan Phoenix Fund, the volatility of funds is higher than the TWSE, which makes them riskier. The last column exhibits the betas of equity funds, which measure the systematic risks of the funds. Four funds' betas are more than 1 and other funds' beta are closer to 1, so Taiwanese funds carry higher or similar risk compared to the benchmark TWSE index. Taiwanese funds are separate from other emerging market funds because these funds are more aggressive than others and carry more risk.

Table 30. Descriptive Statistics of Taiwanese Funds

Fund Name	Average	Skew	Kurtosis	R	Std. dev.	Beta
Allianz Global Investors Taiwan Fund	0.00362	-0.32967	1.20099	0.88095	0.02630	0.95932
Capital OTC Fund	0.00335	-0.15718	0.80151	0.82560	0.03028	1.03662
Cathay Fund	0.00255	-0.40223	1.25657	0.89871	0.02493	0.92920
Fidelity Taiwan Growth Fund	0.00204	-0.36467	2.80054	0.96835	0.02583	1.03573
Franklin Templeton Sino Am First Fund	0.00279	-0.29577	1.38435	0.90420	0.02570	0.96399
Fuh Hwa High Growth Fund	0.00290	-0.48026	1.07085	0.87521	0.02577	0.93420
HSBC Taiwan Phoenix Fund	0.00219	-0.57284	1.59019	0.97244	0.02207	0.88905
Jih Sun Fund	0.00111	-0.47466	1.31417	0.83715	0.02801	0.97230
JP Morgan Taiwan Growth Fund	0.00219	-0.20729	2.14453	0.94898	0.02729	1.07196
Nomura Taiwan Superior Equity Fund	0.00301	-0.36154	1.84144	0.86739	0.02811	1.01002
Pine Bridge Taiwan Giant Fund	0.00236	-0.45159	0.77791	0.82290	0.02802	0.95610
Prudential Financial High Growth Fund	0.00221	-0.4307	0.86042	0.88799	0.02569	0.94580
Sino Pac Fund	0.00260	-0.16078	1.77973	0.92220	0.02492	0.95288
UPAMC All Weather Fund	0.00349	-0.32086	0.93728	0.84719	0.02836	0.99567
Yuanta Excellence Equity Fund	0.00156	-0.51848	1.62461	0.94525	0.02354	0.92230
Taiwanese Stock Exchange (TWSE)	0.00220	-0.35912	1.82517		0.02413	
1-Month Deposit Rate	0.00180	-0.89315	-0.90678		0.00054	

5.3.2 Results of the Sharpe ratio for Taiwan

Table 31 shows the performance of the Sharpe ratio. The higher the Sharpe ratio the more return the investor is getting per unit of risk. The lower the Sharpe ratio, the more risk the investor is carrying to earn additional returns. A higher Sharpe ratio implies that funds have a better performance. While the Allianz Global Investors Taiwan Fund, the UPAMC All Weather Fund and the Capital OTC Fund have the highest Sharpe ratios, the Yuanta Excellence Equity Fund, the Jih Sun Fund and the Fidelity Taiwan Growth Fund have the lowest Sharpe ratio performances.

Table 31. Results of the Sharpe Ratio for Taiwan

Fund Name	Sharpe	Rank
Allianz Global Investors Taiwan Fund	0.06924	1
UPAMC All Weather Fund	0.05971	2
Capital OTC Fund	0.05125	3
Nomura Taiwan Superior Equity Fund	0,04310	4
Fuh Hwa High Growth Fund	0.04290	5
Franklin Templeton Sino Am First Fund	0.03866	6
Sino Pac Fund	0.03223	7
Cathay Fund	0.03043	8
Pine Bridge Taiwan Giant Fund	0.02013	9
HSBC Taiwan Phoenix Fund	0.01810	10
Prudential Financial High Growth Fund	0.01609	11
JP Morgan Taiwan Growth Fund	0.01443	12
Fidelity Taiwan Growth Fund	0.00944	13
Yuanta Excellence Equity Fund	-0.00986	14
Jih Sun Fund	-0.02453	15

5.3.3 Results of the Treynor ratio for Taiwan

Table 32 shows the performance of the Treynor ratio. A fund with a higher Treynor ratio indicates that the fund has a better risk-adjusted return compared to a fund with a lower Treynor ratio. A higher Treynor ratio implies that funds have better performances. The Allianz Global Investors Taiwan Fund, the UPAMC All Weather Fund and the Capital OTC Fund have the highest Treynor ratios. The Yuanta Excellence Equity Fund, the Jih Sun Fund and the Fidelity Taiwan Growth Fund have the lowest Treynor ratio performances.

Table 32. Results of the Treynor Ratio for Taiwan

Fund Name	Treynor	Rank
Allianz Global Investors Taiwan Fund	0.00190	1
UPAMC All Weather Fund	0.00170	2
Capital OTC Fund	0.00150	3
Nomura Taiwan Superior Equity Fund	0.00120	4
Fuh Hwa High Growth Fund	0.00118	5
Franklin Templeton Sino Am First Fund	0.00103	6
Sino Pac Fund	0.00084	7
Cathay Fund	0.00082	8
Pine Bridge Taiwan Giant Fund	0.00059	9
HSBC Taiwan Phoenix Fund	0.00045	10
Prudential Financial High Growth Fund	0.00044	11
JP Morgan Taiwan Growth Fund	0.00037	12
Fidelity Taiwan Growth Fund	0.00024	13
Yuanta Excellence Equity Fund	-0.00025	14
Jih Sun Fund	-0.00071	15

5.3.4 Results of Jensen's alpha for Taiwan

Table 33 shows us the results of Jensen's alpha measure that indicates the selectivity skills of fund managers. Fund managers have either a higher performance or a lower performance relative to the market. Eleven of the 15 funds have positive alphas, but only the Allianz Global Investors Taiwan Fund is positively statistically significant at the 5% level. In addition, four funds have negative alphas and all of them are statistically insignificant. Taiwanese equity fund managers do not show selectivity skills during the study period.

Table 33. Results of Jensen's alpha for Taiwan

Fund Name	alpha	t stat	p-value
Allianz Global Investors Taiwan Fund**	0.00143	1.99746	0.04667
UPAMC All Weather Fund	0.00129	1.48542	0.13847
Capital OTC Fund	0.00113	1.14870	0.25159
Nomura Taiwan Superior Equity Fund	0.00080	0.99316	0.32143
Fuh Hwa High Growth Fund	0.00072	1.00995	0.31333
Franklin Templeton Sino Am First Fund	0.00060	0.94925	0.34325
Sino Pac Fund	0.00041	0.74617	0.45615
Cathay Fund	0.00038	0.60193	0.54767
Pine Bridge Taiwan Giant Fund	0.00017	0.18885	0.85034
HSBC Taiwan Phoenix Fund	0.00004	0.12037	0.90427
Prudential Financial High Growth Fund	0.00003	0.03874	0.96912
JP Morgan Taiwan Growth Fund	-0.00004	-0.09079	0.92772
Fidelity Taiwan Growth Fund	-0.00018	-0.48611	0.62724
Yuanta Excellence Equity Fund	-0.00061	-1.38103	0.16829
Jih Sun Fund	-0.00109	-1.23270	0.21865

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.3.5 Results of the Sortino ratio for Taiwan

The Sortino ratio has to do with returns that decrease below a user-specific minimum or the required rate of return (minimum accepted return, or MAR). In other words, it measures the excess return against the risk of not meeting the minimum return. A high Sortino ratio is better than a low Sortino ratio because a high Sortino ratio denotes low downside volatility compared to the expected return. Table 34 displays results of the Sortino ratio. The Allianz Global Investors Taiwan Fund, the UPAMC All Weather Fund and the Capital OTC Fund have the highest Sortino ratios. The Yuanta Excellence Equity Fund, the Jih Sun Fund and the Fidelity Taiwan Growth Fund have the lowest Sortino ratio performances.

Table 34. Results of the Sortino Ratio for Taiwan

Fund Name	Sortino	Rank
Allianz Global Investors Taiwan Fund	0.01133	1
UPAMC All Weather Fund	0.00958	2
Capital OTC Fund	0.00817	3
Nomura Taiwan Superior Equity Fund	0.00703	4
Fuh Hwa High Growth Fund	0.00675	5
Franklin Templeton Sino Am First Fund	0.00616	6
Sino Pac Fund	0.00530	7
Cathay Fund	0.00479	8
Pine Bridge Taiwan Giant Fund	0.00301	9
HSBC Taiwan Phoenix Fund	0.00285	10
Prudential Financial High Growth Fund	0.00247	11
JP Morgan Taiwan Growth Fund	0.00232	12
Fidelity Taiwan Growth Fund	0.00148	13
Yuanta Excellence Equity Fund	-0.00148	14
Jih Sun Fund	-0.00361	15

5.3.6 Results of the M^2 (Modigliani & Modigliani) ratio for Taiwan

Table 35 displays results of the M^2 measure. Higher M^2 implies that funds have a better performance. While the Allianz Global Investors Taiwan Fund, the UPAMC All Weather Fund and the Capital OTC Fund have the highest M^2 ratios, the Yuanta Excellence Equity Fund, the Jih Sun Fund and the Fidelity Taiwan Growth Fund have the lowest M^2 performances.

Table 35. Results of the M^2 Ratio for Taiwan

Fund Name	M^2	Rank
Allianz Global Investors Taiwan Fund	0.00347	1
UPAMC All Weather Fund	0.00324	2
Capital OTC Fund	0.00303	3
Nomura Taiwan Superior Equity Fund	0.00284	4
Fuh Hwa High Growth Fund	0.00283	5
Franklin Templeton Sino Am First Fund	0.00273	6
Sino Pac Fund	0.00257	7
Cathay Fund	0.00253	8
Pine Bridge Taiwan Giant Fund	0.00228	9
HSBC Taiwan Phoenix Fund	0.00223	10
Prudential Financial High Growth Fund	0.00218	11
JP Morgan Taiwan Growth Fund	0.00214	12
Fidelity Taiwan Growth Fund	0.00202	13
Yuanta Excellence Equity Fund	0.00156	14
Jih Sun Fund	0.00120	15

5.3.7 Results of the Treynor & Mazuy regression analysis for Taiwan

The Treynor & Mazuy (1966) analysis analyzes the market timing ability of fund managers. If fund managers believe that the market is going up, they change their portfolio composition from less volatile to high volatile securities. When the market is going down, they shift their portfolio composition from high volatile to less volatile securities. If fund managers have market timing ability, they create their portfolios according to their estimates of the tendency of the markets. Table 36 displays the results of the Treynor & Mazuy (1966) method. Only the Sino Pac Fund and the JP Morgan Taiwan Growth Fund have positive market timing ability but both are statistically insignificant. The other 13 funds are negatively statistically insignificant. Among them, the HSBC Taiwan Phoenix is statistically significant at the 1% level while the Yuanta Excellence Equity Fund, the Fuh Hwa High Growth Fund and the Prudential Financial High Growth Fund are statistically significant at

the 5% level. The Nomura Taiwan Superior Equity Fund and the Jih Sun Fund are statistically significant at the 10% level. According the regression analysis, Taiwanese fund managers do not have market timing ability.

Table 36. Results of the Treynor & Mazuy Regression Analysis for Taiwan

Fund Name	T & M	t-stat	p-value
Sino Pac Fund	0.35304	0.72196	0.47088
JP Morgan Taiwan Growth Fund	0.18468	0.42237	0.67305
Allianz Global Investors Taiwan Fund	-0.04179	-0.06614	0.94731
Fıdelity Taiwan Growth Fund	-0.37980	-1.16181	0.24623
Franklin Templeton Sino Am First Fund	-0.46129	-0.82843	0.40808
UPAMC All Weather Fund	-0.60749	-0.79467	0.42743
Cathay Fund	-0.70434	-1.27174	0.20445
Yuanta Excellence Equity Fund**	-0.82547	-2.13207	0.03381
Capital OTC Fund	-0.87197	-1.00652	0.31497
HSBC Taiwan Phoenix Fund***	-1.00656	-3.95870	0.00009
Pine Bridge Taiwan Giant Fund	-1.05572	-1.30948	0.19137
Prudential Financial High Growth Fund**	-1.19875	-2.01108	0.04521
Fuh Hwa High Growth Fund**	-1.24855	-1.98527	0.04802
Nomura Taiwan Superior Equity Fund*	-1.32120	-1.87044	0.06239
Jih Sun Fund**	-1.72785	-2.23871	0,02590

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.3.8 Results of the Henriksson & Merton regression analysis for Taiwan

Another approach for market timing ability is the Henriksson & Merton (1984) regression analysis method. Market timing ability allows fund managers to forecast whether returns of funds will be higher than the risk-free rate or vice versa. Table 37 shows the result of Henriksson & Merton (1981) method. According to the results, only two funds have positive market timing ability but these are statistically insignificant. Thirteen funds have negative market timing ability and solely the HSBC Taiwan Phoenix Fund is statistically significant at the 10% level.

Table 37. Results of the Henriksson & Merton Regression Analysis for Taiwan

Fund Name	H & M	t-stat	p-value
JP Morgan Taiwan Growth Fund	0.00585	0.16159	0.87174
Sino Pac Fund	0.00578	0.14249	0.88679
Allianz Global Investors Taiwan Fund	-0.00787	-0.15037	0.88058
Franklin Templeton Sino Am First Fund	-0.02572	-0.55723	0.57779
Cathay Fund	-0.03028	-0.65867	0.51061
Fidelity Taiwan Growth Fund	-0.03029	-1.11832	0.26432
UPAMC All Weather Fund	-0.03294	-0.51975	0.60362
Yuanta Excellence Equity Fund	-0.03704	-1.14855	0.25165
Prudential Financial High Growth Fund	-0.03718	-0.74861	0.45467
Pine Bridge Taiwan Giant Fund	-0.03878	-0.57932	0.56281
HSBC Taiwan Phoenix Fund*	-0.04159	-1.93677	0.05371
Nomura Taiwan Superior Equity Fund	-0.04267	-0.72554	0.46868
Capital OTC Fund	-0.04507	-0.62736	0.53089
Fuh Hwa High Growth Fund	-0.06692	-1.27959	0.20167
Jih Sun Fund	-0.06998	-1.08756	0.27766

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.4 Results and analysis of South African funds

5.4.1 Descriptive statistics for South African funds

Descriptive statistics of South African equity funds, benchmarks and risk-free rates are given in Table 38. The Average column indicates returns of funds, benchmarks and risk-free rates. The average returns of the Foord Equity Fund, the Coronation Equity Fund, the Sanlam Equity Fund, the Prudential Equity Fund, the Allan Gray Equity Fund, and the Aylett Equity Fund are higher than the Johannesburg Stock Exchange (JSE). The Skew column displays the skew of equity funds and the corresponding value of their benchmarks. All funds and benchmarks are skewed negatively, denoting a distribution with an asymmetric tail extending toward more negative values. Only 91-Day T-Bills have are skewed positively, which indicates a distribution with an asymmetric tail extending toward more positive values. All

funds, benchmarks and risk-free rates have positive kurtosis, which implies typical heavy tailed financial distributions. The R column depicts correlation between funds and benchmarks. The average correlation of funds and their benchmarks is 0.88835, which means that there is a strong positive correlation. The Investec Equity Fund has the highest correlation (0.91912) and the Aylett Equity Fund has the lowest correlation (0.81560). The Standard Deviation column shows the volatility of equity funds, benchmarks and risk-free rates. The JSE has the highest standard deviation and the Huysamer Equity Fund, the Old Mutual Fund Investors Fund A and the Coronation Equity Fund follow the JSE, in that order. The last column exhibits the betas of equity funds, which measure the systematic risks of the funds. All funds' betas are less than 1, thereby implying all ten funds carry less risk compared to the benchmark JSE index.

Table 38. Descriptive Statistics of South African Mutual Funds

Fund Name	Average	Skew	Kurtosis	R	Std. dev.	Beta
Allan Gray Equity Fund A	0.00294	-0.14658	0.47853	0.88851	0.01671	0.70082
Aylett Equity Fund A	0.00274	-0.60731	2.23169	0.81560	0.01491	0.57420
Coronation Equity Fund A	0.00311	-0.40631	1.60011	0.90683	0.01959	0.83870
Foord Equity Fund	0.00341	-1.16657	4.79512	0.84114	0.01908	0.75775
Huysamer Equity Fund A	0.00196	-0.36986	0.73769	0.91590	0.02101	0.90866
Investec Equity Fund A	0.00249	-0.45212	0.87945	0.91912	0.01942	0.84275
Nedgroup Invs.Rainmaker Fund A	0.00296	-0.43856	0.94558	0.86200	0.01791	0.72878
Old Mutual Investors Fund A	0.00266	-0.39145	1.51906	0.91580	0.02002	0.67586
Prudential Equity Fund A	0.00303	-0.42926	0.75831	0.89968	0.01807	0.76733
Sanlam General Equity Fund A	0.00309	-0.34637	1.96319	0.91900	0.01844	0.80007
Johannesburg Stock Exchange (JSE)	0.00272	-0.37635	1.08352		0.02119	
91 Days T-Bills	0.00111	1.81350	4.05245		0.00019	

5.4.2 Results of the Sharpe ratio for South Africa

Table 39 shows the performance of the Sharpe ratio. The higher the Sharpe ratio the more return the investor is getting per unit of risk. The lower the Sharpe ratio, the

more risk the investor is carrying to earn additional returns. A higher Sharpe ratio implies that funds have a better performance. The Foord Equity Fund, the Allan Gray Equity Fund and the Aylett Equity Fund have the highest the Sharpe ratios. On the other end, the Huysamer Equity Fund and the Investec Equity Fund have the lowest Sharpe ratios.

Table 39. Results of the Sharpe Ratio for South Africa

Fund Name	Sharpe	Rank
Foord Equity Fund A	0.12015	1
Allan Gray Equity Fund A	0.10911	2
Aylett Equity Fund A	0.1091	3
Sanlam General Equity Fund A	0.10723	4
Prudential Equity Fund A	0.10592	5
Coronation Equity Fund A	0.10194	6
Old Mutual Investors Fund A	0.09250	7
Nedgroup Invs.Rainmaker Fund A	0.08622	8
Investec Equity Fund A	0.07065	9
Huysamer Equity Fund A	0.04016	10

5.4.3 Results of the Treynor ratio for South Africa

Table 40 shows the performance of the Treynor ratio. A fund with a higher Treynor ratio indicates that the fund has a better risk-adjusted return compared to a fund with a lower Treynor ratio. A higher Treynor ratio implies that funds have better performances. The Foord Equity Fund, the Allan Gray Equity Fund and the Aylett Equity Fund have the highest the Treynor ratios. The Huysamer Equity Fund and the Investec Equity Fund have the lowest Treynor ratios.

Table 40. Results of the Treynor Ratio for South Africa

Fund Name	Treynor	Rank
Foord Equity Fund A	0.00302	1
Aylett Equity Fund A	0.00283	2
Allan Gray Equity Fund A	0.00260	3
Prudential Equity Fund A	0.00249	4
Sanlam General Equity Fund A	0.00247	5
Coronation Equity Fund A	0.00238	6
Old Mutual Investors Fund A	0.00214	7
Nedgroup Invs.Rainmaker Fund A	0.00212	8
Investec Equity Fund A	0.00163	9
Huysamer Equity Fund A	0.00093	10

5.4.4 Results of Jensen's alpha for South Africa

Table 41 shows us the results of Jensen's alpha measure that indicates the selectivity skills of fund managers. Fund managers have either a higher performance or a lower performance relative to the market. Nine out of the 10 funds have positive alphas, but only the Foord Equity Fund is both positive and statistically significant at the 10% levels. On the other hand, the Huysamer Equity Fund A is only negative.

Table 41. Results of Jensen's alpha for South Africa

Fund Name	Jensen's alpha	t Stat	p-value
Foord Equity Fund*	0.00108	1.81125	0.07110
Aylett Equity Fund A	0.00071	1.42027	0.15656
Allan Gray Equity Fund A	0.00070	1.58364	0.11432
Sanlam General Equity Fund A	0.00070	1.65877	0.09820
Prudential Equity Fund A	0.00068	1.50361	0.13373
Coronation Equity Fund A	0.00065	1.37156	0.17122
Old Mutual Investors Fund A	0.00046	1.00241	0.31695
Nedgroup Invs.Rainmaker Fund A	0.00038	0.71888	0.47277
Investec Equity Fund A	0.00002	0.04805	0.96171
Huysamer Equity Fund A	-0.00061	-1.26111	0.20824

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.4.5 Results of the Sortino ratio for South Africa

The Sortino ratio has to do with returns that decrease below a user-specific minimum or the required rate of return (minimum accepted return, or MAR). In other words, it measures the excess return against the risk of not meeting the minimum return. A high Sortino ratio is better than a low Sortino ratio because a high Sortino ratio denotes low downside volatility compared to the expected return. Table 42 denotes the results of the Sortino ratio. While the Foord Equity Fund, the Aylett Equity Fund and the Sanlam General Equity Fund have the highest Sortino ratios, the Huysamer Equity Fund and the Investec Equity Fund have the lowest Sortino ratio performances.

Table 42. Results of the Sortino Ratio for South Africa

Fund Name	Sortino	Rank
Foord Equity Fund	0.02214	1
Aylett Equity Fund A	0.01924	2
Sanlam General Equity Fund A	0.01899	3
Allan Gray Equity Fund A	0.01872	4
Prudential Equity Fund A	0.01822	5
Coronation Equity Fund A	0.01786	6
Old Mutual Investors Fund A	0.01607	7
Nedgroup Invs.Rainmaker Fund A	0.01443	8
Investec Equity Fund A	0.01154	9
Huysamer Equity Fund A	0.00638	10

5.4.6 Results of the M^2 (Modigliani & Modigliani) ratio for South Africa

Table 43 displays results of the M^2 measure. Higher M^2 implies that funds have a better performance. The Foord Equity Fund, the Allan Gray Equity Fund and the Aylett Equity Fund have the highest M^2 ratios. The Huysamer Equity Fund and the Investec Equity Fund have the lowest M^2 performances.

Table 43. Results of the M^2 ratio for South Africa

Fund Name	M^2	Rank
Foord Equity Fund	0.00366	1
Allan Gray Equity Fund A	0.00343	2
Aylett Equity Fund A	0.00343	3
Sanlam General Equity Fund A	0.00339	4
Prudential Equity Fund A	0.00336	5
Coronation Equity Fund A	0.00327	6
Old Mutual Investors Fund A	0.00307	7
Nedgroup Invs.Rainmaker Fund A	000294	8
Investec Equity Fund A	0.00261	9
Huysamer Equity Fund A	0.00197	10

5.4.7 Results of the Treynor & Mazuy regression analysis for South Africa

The Treynor & Mazuy (1966) analysis analyzes the market timing ability of fund managers. If fund managers believe that the market is going up, they change their portfolio composition from less volatile to high volatile securities. When the market is going down, they shift their portfolio composition from high volatile to less volatile securities. If fund managers have market timing ability, they create their portfolios according to their estimates of the tendency of the markets. Table 44 shows the results of the Treynor & Mazuy (1966) method. Only the Allan Gray Equity Fund A has a positive result but is statistically insignificant. The other nine funds have negative market timing ability and only the Old Mutual Investors Fund A is statistically significant at the 10% level. It is concluded that fund managers did not have market timing ability during the quantitative easing policy era.

Table 44. Results of the Treynor & Mazuy Regression Analysis for South Africa

Fund Name	T & M	t-stat	p-value
Allan Gray Equity Fund A	0.50666	0.88948	0.37445
Aylett Equity Fund A	-0.93854	-1.46723	0.14336
Coronation Equity Fund A	-0.59628	-0.97207	0.33179
Foord Equity Fund	-1.19570	-1.56380	0.11891
Huysamer Equity Fund A	0.22466	0.35809	0.72053
Investec Equity Fund A	-0.29696	-0.52182	0.60218
Nedgroup Invs.Rainmaker Fund A	0.31096	0.46058	0.64543
Old Mutual Investors Fund A*	-1.46072	-2.48106	0.01364
Prudential Equity Fund A	-0.59436	-1.01461	0.31111
Sanlam General Equity Fund A	-0.35064	-0.64866	0.51705

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.4.8 Results of Henriksson & Merton regression analysis for South Africa

Another approach for market timing ability is the Henriksson & Merton (1984) regression analysis method. Market timing ability allows fund managers to forecast whether returns of funds will be higher than the risk-free rate or vice versa. Table 45 shows the results of the Henriksson & Merton (1981) method. The Allan Gray Equity Fund has positive results but is statistically insignificant. Nine funds have negative market timing ability and are not statistically significant.

Table 45. Results of the Henriksson & Merton Regression Analysis for South Africa

Fund Name	H & M	t-stat	p-value
Allan Gray Equity Fund A	0.00463	0.1298	0.89681
Aylett Equity Fund A	-0.03272	-0.81571	0.41531
Coronation Equity Fund A	-0.03503	-0.91272	0.36212
Foord Equity Fund	-0.04335	-0.90395	0.36674
Huysamer Equity Fund A	-0.00686	-0.17483	0.72215
Investec Equity Fund A	-0.02862	-0.80443	0.42178
Nedgroup Invs.Rainmaker Fund A	-0.00348	-0.08243	0.93436
Old Mutual Investors Fund A	-0.03807	-1.02526	0.30606
Prudential Equity Fund A	-0.03166	-0.86363	0.38848
Sanlam General Equity Fund A	-0.02094	-0.61917	0.53627

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.5 Results and analysis of Indian funds

5.5.1 Descriptive statistics of Indian funds

Descriptive statistics of Indian equity funds, benchmarks and risk-free rates are given in Table 46. The Average column indicates returns on funds, benchmarks and risk-free rates. Other than the Sundaram Growth Fund and the Indian 1-Year T-Bill, the average returns of all funds are higher than the CNX500 price index. The Skew column displays the skew of equity funds and the corresponding value of their benchmarks. All funds and benchmark are negatively skewed which denotes a distribution with an asymmetric tail extending toward more negative values. Only the 1-Year T-Bill is skewed positively, which indicates a distribution with an asymmetric tail extending toward more positive values. All funds and benchmarks have positive kurtosis, which infers typical heavy tailed financial distributions and risk-free rate has negative kurtosis, which implies a relatively flat distribution. The R column depicts the correlation between funds and their benchmarks. The average correlation of funds and their benchmarks is 0.95925, which means that there is a strong positive correlation. The L & T Equity Growth Fund has the highest correlation (0.98080) and the Religare Invesco Growth Fund has the lowest correlation (0.90691). The Standard Deviation column shows volatility of equity funds, benchmarks and risk-free rates. Standard deviation of the HDFC Equity Growth Fund, the Sundaram Growth Fund and the Birla Sun Life Equity Growth Fund are higher than the CNX500, which makes them more volatile than their benchmark. The last column exhibits betas of equity funds, which measure the systematic risks of the funds. All funds' betas are less than 1, implying that all ten funds carry less risk compared to the benchmark JSE index.

Table 46. Descriptive Statistics of Indian Funds

Fund Name	Average	Skew	Kurtosis	R	Std. dev.	Beta
Birla Sun Life Equity Growth	0.00386	0.51520	4.41315	0.97728	0.02849	0.98023
DSP Blackrock Equity Growth	0.00394	0.67331	4.38487	0.94923	0.02626	0.87807
HDFC Equity Growth	0.00455	0.43879	3.74740	0.96286	0.02907	0.98570
ICICI Prudential Dynamic Plan Growth	0.00411	0.20379	1.70031	0.95479	0.02149	0.72296
IDFC Equity Fund	0.00346	0.55093	3.17477	0.93411	0.02820	0.92766
L & T Equity Growth	0.00411	0.37458	2.39007	0.98080	0.02440	0.84316
Reliance Growth Fund	0.00393	0.53665	4.62021	0.95508	0.02804	0.94332
Religare Invesco Growth Fund	0.00358	0.44458	2.33631	0.90691	0.01884	0.60230
SBI Magnum Equity Growth	0.00392	0.90585	6.72613	0.96966	0.02610	0.89136
Sundaram Growth Fund	0.00290	0.12332	2.50491	0.97365	0.02857	0.97924
Tata Pure Equity Growth	0.00358	0.49361	4.08968	0.97107	0.02448	0.83726
UTI Equity Fund-Growth	0.00421	0.34320	1.55537	0.97558	0.02297	0.78954
CNX 500	0.00340	0.49500	3.75628		0.02840	
Indian T-Bill 1 year	0.00134	-0.80741	-0.77112		0.00031	

5.5.2 Results of the Sharpe ratio for India

Table 47 shows the performance of the Sharpe ratio. The higher the Sharpe ratio the more return the investor is getting per unit of risk. The lower the Sharpe ratio, the more risk the investor is carrying to earn additional returns. A higher Sharpe ratio implies that funds have a better performance. The ICICI Prudential Dynamic Plan Growth, the UTI Equity Fund Growth and the Religare Invesco Growth Fund have the highest Sharpe ratios. The Sundaram Growth Fund, the IDFC Equity Fund and the Birla Sun Life Equity Growth have the lowest Sharpe ratios.

Table 47. Results of the Sharpe Ratio for India

Fund Name	Sharpe	Rank
ICICI Prudential Dynamic Plan Growth	0.12902	1
UTI Equity Fund-Growth	0.12477	2
Religare Invesco Growth Fund	0.11899	3
L&T Equity Growth	0.11353	4
HDFC Equity Growth	0.11031	5
DSP Blackrock Equity Growth	0.09891	6
SBI Magnum Equity Growth	0.09866	7
Reliance Growth Fund	0.09249	8
Tata Pure Equity Growth	0.09139	9
Birla Sun Life Equity Growth	0.08827	10
IDFC Equity Fund	0.07528	11
Sundaram Growth Fund	0.05465	12

5.5.3 Results of Treynor ratio for India

Table 48 shows the performance of the Treynor ratio. A fund with a higher Treynor ratio indicates that the fund has a better risk-adjusted return compared to a fund with a lower Treynor ratio. A higher Treynor ratio implies that funds have better performances. The ICICI Prudential Dynamic Plan Growth, the UTI Equity Fund Growth and the Religare Invesco Growth Fund have the highest Treynor ratios. The IDFC Equity Fund, the Birla Sun Life Equity Growth and the Sundaram Growth Fund have the lowest Treynor ratios.

Table 48. Results of the Treynor Ratio for India

Fund Name	Treynor	Rank
ICICI Prudential Dynamic Plan Growth	0.00384	1
Religare Invesco Growth Fund	0.00372	2
UTI Equity Fund-Growth	0.00363	3
L&T Equity Growth	0.00329	4
HDFC Equity Growth	0.00325	5
DSP Blackrock Equity Growth	0.00296	6
SBI Magnum Equity Growth	0.00289	7
Reliance Growth Fund	0.00275	8
Tata Pure Equity Growth	0.00267	9
Birla Sun Life Equity Growth	0.00257	10
IDFC Equity Fund	0.00229	11
Sundaram Growth Fund	0.00159	12

5.5.4 Results of Jensen's alpha for India

Table 49 shows the results of Jensen's alpha measure that indicates the selectivity skills of fund managers. Fund managers have either a higher performance or a lower performance relative to the market. Eleven of the 12 funds have positive alphas and among them 7 are statistically significant. The DSP Blackrock Equity Growth is statistically significant at the 10% level; the Religare Invesco Growth Fund and SBI Magnum Equity Fund are statistically significant at the 5% level; the ICICI Prudential Dynamic Plan Growth, the UTI Equity Fund Growth, the Religare Invesco Growth Fund and the L & T Equity Growth Fund are statistically significant at the 1% level. Only the Sundaram Growth Fund has a negative alpha. It can be interpreted that Indian fund managers, in general, had selectivity skills during the quantitative easing era term.

Table 49. Results of Jensen's alpha for India

Fund Name	Jensen's alpha	t-stat	p-value
ICICI Prudential Dynamic Plan Growth***	0.00129	3.49453	0.00055
UTI Equity Fund-Growth***	0.00124	4.27385	0.00003
HDFC Equity Growth***	0.00118	2.60977	0.00951
L & T Equity Growth***	0.00104	3.77797	0.00019
Religare Invesco Growth Fund**	0.00100	2.19174	0.02916
DSP Blackrock Equity Growth*	0.00079	1.66388	0.09717
SBI Magnum Equity Growth**	0.00074	2.01898	0.04437
Reliance Growth Fund	0.00065	1.36660	0.17277
Tata Pure Equity Growth	0.00052	1.53034	0.12698
Birla Sun Life Equity Growth	0.00050	1.43494	0.15234
IDFC Equity Fund	0.00022	0.37198	0.71017
Sundaram Growth Fund	-0.00045	-1.20616	0.22870

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.5.5 Results of the Sortino ratio for India

The Sortino ratio has to do with returns that decrease below a user-specific minimum or the required rate of return (minimum accepted return, or MAR). In other words, it measures the excess return against the risk of not meeting the minimum return. A high Sortino ratio is better than a low Sortino ratio because a high Sortino ratio denotes low downside volatility compared to the expected return. Table 50 demonstrates the results of the Sortino ratio. The ICICI Prudential Dynamic Plan Growth, the UTI Equity Fund Growth and the Religare Invesco Growth Fund have the highest Sortino ratios. The Sundaram Growth Fund, the IDFC Equity Fund and the Birla Sun Life Equity Growth have the lowest Sortino ratio performances.

Table 50. Results of the Sortino Ratio for India

Fund Name	Sortino	Rank
ICICI Prudential Dynamic Plan Growth	0.02342	1
UTI Equity Fund-Growth	0.02164	2
Religare Invesco Growth Fund	0.02104	3
L & T Equity Growth	0.01989	4
HDFC Equity Growth	0.01952	5
SBI Magnum Equity Growth	0.01770	6
DSP Blackrock Equity Growth	0.01683	7
Reliance Growth Fund	0.01600	8
Tata Pure Equity Growth	0.01580	9
Birla Sun Life Equity Growth	0.01523	10
IDFC Equity Fund	0.01261	11
Sundaram Growth Fund	0.00888	12

5.5.6 Results of the M^2 (Modigliani & Modigliani) ratio for India

Table 51 displays results of the M^2 measure. Higher M^2 implies that funds have a better performance. The ICICI Prudential Dynamic Plan Growth, the UTI Equity Fund Growth and the Religare Invesco Growth Fund have the highest M^2 ratios. The Sundaram Growth Fund, the IDFC Equity Fund and the Birla Sun Life Equity Growth have the lowest M^2 performances.

Table 51. Results of the M^2 ratio for Indian Funds

Fund Name	M^2	Rank
ICICI Prudential Dynamic Plan Growth	0.00501	1
UTI Equity Fund Growth	0.00488	2
Religare Invesco Growth Fund	0.00472	3
L & T Equity Growth	0.00457	4
HDFC Equity Growth	0.00447	5
DSP Blackrock Equity Growth	0.00415	6
SBI Magnum Equity Growth	0.00414	7
Reliance Growth Fund	0.00397	8
Tata Pure Equity Growth	0.00394	9
Birla Sun Life Equity Growth	0.00385	10
IDFC Equity Fund	0.00348	11
Sundaram Growth Fund	0.00289	12

5.5.7 Results of the Treynor & Mazuy regression analysis for India

The Treynor & Mazuy (1966) analysis analyzes the market timing ability of fund managers. If fund managers believe that the market is going up, they change their portfolio composition from less volatile to high volatile securities. When the market is going down, they shift their portfolio composition from high volatile to less volatile securities. If fund managers have market timing ability, they create their portfolios according to their estimates of the tendency of the markets. Table 52 denotes the results of the Treynor & Mazuy (1966) method. Eight out of the 12 funds have positive results, but only the SBI Magnum Equity Growth is both positive and statistically significant at the 1% level. The ICICI Prudential Dynamic Plan Growth is statistically significant at the 10% level and the Sundaram Growth Fund is statistically significant at the 1% level. Consequently, fund managers did not have market timing ability during the quantitative easing policy era. Four funds have a negative market timing ability.

Table 52. Results of the Treynor & Mazuy Regression Analysis for India

Fund Name	T&M	t-stat	p-value
SBI Magnum Equity Growth***	0.72864	3.97980	0.00009
DSP Blackrock Equity Growth	0.31648	1.30499	0.19289
Tata Pure Equity Growth	0.12662	0.73637	0.46208
IDFC Equity Fund	0.10798	0.36448	0.71575
Bırla Sun Lıfe Equity Growth	0.09274	0.52213	0.60196
Reliance Growth Fund	0.08542	0.34930	0.72711
HDFC Equity Growth	0.07225	0.31284	0.75462
Religare Invesco Growth Fund	0.02882	0.12324	0.90200
L & T Equity Growth	-0.21318	-1.52602	0.12805
UTI Equity Fund Growth	-0.23444	-1.58402	0.11424
ICICI Prudential Dynamic Plan Growth*	-0.34777	-1.85942	0.06394
Sundaram Growth Fund***	-0.68809	-3.6686	0.00029

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.5.8 Results of the Henriksson & Merton regression analysis for India

Another approach for market timing ability is the Henriksson & Merton (1984) regression analysis method. Market timing ability allows fund managers to forecast whether returns of funds will be higher than the risk-free rate or vice versa. Table 53 shows the result of Henriksson & Merton (1981) method. According to the results, 6 of the 12 funds are positive but statistically insignificant. The other 6 funds are negative and statistically insignificant. Indian fund managers did not have market timing ability during the study period.

Table 53. Results of the Henriksson & Merton Regression Analysis for India

Fund Name	H & M	t-stat	p-value
SBI Magnum Equity Growth	0.02649	1.32164	0.18729
IDFC Equity Fund	0.00620	0.19542	0.84520
Religare Invesco Growth Fund	0.00515	0.20572	0.83715
DSP Blackrock Equity Growth	0.00500	0.19205	0.84784
HDFC Equity Growth	0.00174	0.07038	0.94394
L & T Equity Growth	0.00073	0.04895	0.96099
Tata Pure Equity Growth	-0.00166	-0.09027	0.92814
UTI Equity Fund Growth	-0.00320	-0.20135	0.84056
Birla Sun Life Equity Growth	-0.00630	-0.33119	0.74073
ICICI Prudential Dynamic Plan Growth	-0.00761	-0.37793	0.70575
Reliance Growth Fund	-0.01434	-0.54810	0.58403
Sundaram Growth Fund	-0.03086	-1.51005	0.13208

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.6 Results and analysis of Mexican funds

5.6.1 Descriptive statistics for Mexican funds

Descriptive statistics of Mexican equity funds, benchmarks and risk-free rates are given in Table 54. The Average column indicates returns on funds, benchmarks and risk-free rates. Except the Activariable SA DE CV SIRV, returns on all funds are higher than the BOLSA. The Skew column displays the skew of equity funds and the

corresponding value of their benchmarks. 91-Day T-bills, BOLSA, the Principal RV A1 SA DE CV SIRV, the Norteselectivo SA DE CV, the Apolo Indizado SA DE CV SIRV, the Activariable SA DE CV SIRV and the IXE Comun SA DE CV SIRV have a positive skew, which indicates a distribution with an asymmetric tail extending toward more positive values. The other six funds have a negative skew that denotes a distribution with an asymmetric tail extending toward more negative values. All funds, benchmarks and risk-free rates have positive kurtoses, which implies typical heavy tailed financial distributions. The R column describes the correlation between funds and their benchmarks. The average correlation of funds and their benchmarks is 0.86622, which implies that there is a strong positive correlation. The Sura Patrimonial SA DE CV SIRV has the highest correlation (0.92226) and the GBM Fondo de Inversion Modelo SA DE CV has the lowest correlation (0.81794) when funds are compared individually. The Standard Deviation column shows the volatility of equity funds, benchmarks and risk-free rates. While the BOLSA has the highest standard deviation, the 91-Day T-bill has the lowest standard deviation. The last column shows the betas of equity funds, which measure the systematic risks of the funds. All funds' betas are less than 1, implying that all fourteen funds carry less risk compared to the benchmark BOLSA index.

Table 54. Descriptive Statistics of Mexican Funds

Fund Name	Average	Skew	Kurtosis	R	Stdv	Beta
Actipatrimonial SA DE CV	0.00258	-0.09532	1.67876	0.85718	0.02106	0.79946
Activariable SA DE CV SIRV	0.00216	0.05432	1.90725	0.88198	0.02381	0.87112
Apolo Indizado SA DE CV SIRV	0.00313	0.05432	1.90725	0.88198	0.02381	0.87112
BBVA Bancomer Patriominial SA CV	0.00222	-0.09648	1.48491	0.83924	0.02236	0.81210
Citiacciones Patrimonial SA DE CV SIRV	0.00267	-0.08202	1.53949	0.83730	0.02321	0.83273
GBM Fondo de Inversion Modelo SA DE CV SIRV	0.00388	-0.49848	2.99054	0.81794	0.01981	0.73288
IXE Comun SA DE CV SIRV	0.00281	0.04154	1.30328	0.88412	0.02174	0.81617
Norteselectivo SA DE CV	0.00242	0.14622	1.79790	0.83249	0.02430	0.84640
Principal RV A1 SA DE CV SIRV	0.00255	0.21414	2.39546	0.91782	0.02338	0.87026
Santander Indizado SA DE CV SIRV	0.00220	-0.01599	1.80181	0.85565	0.02355	0.84785
Sura Patrimonial SA DE CV SIRV	0.00300	-0.06802	1.25174	0.92269	0.02387	0.88843
Mexican Stock Exchange (BOLSA)	0.00217	0.36399	2.72326		0.02591	
91 days T-bills	0.00081	1.56346	5.09509		0.00016	

5.6.2 Results of the Sharpe ratio for Mexico

Table 55 shows the performance of the Sharpe ratio. The higher the Sharpe ratio the more return the investor is getting per unit of risk. The lower the Sharpe ratio, the more risk the investor is carrying to earn additional returns. A higher Sharpe ratio implies that funds have a better performance. The GBM Fondo de Inversion Modelo SA DE CV SIRV, the Apolo Indizado SA DE CV SIRV A and the IXE Comun SA DE CV SIRV A have the highest performances for the Sharpe ratio. Performances of the Activariable SA DE CV SIRV B, the Santander Indizado SA DE CV SIRV, and the Norteselectivo SA DE CV have the lowest performances for the Sharpe ratio.

Table 55. Results of the Sharpe Ratio for Mexico

Fund Name	Sharpe	Rank
GBM Fondo de Inversion Modelo SA DE CV SIRV	0.36623	1
Apolo Indizado SA DE CV SIRV A	0.32764	2
IXE Comun SA DE CV SIRV A	0.28468	3
Actipatrimonial SA DE CV B	0.28299	4
Sura Patrimonial SA DE CV SIRV	0.26702	5
Citiacciones Patrimonial SA DE CV SIRV	0.26049	6
Principal RV A1 SA DE CV SIRV	0.25361	7
BBVA Bancomer Patriominial SA CV B	0.25027	8
Norteselectivo SA DE CV	0.23840	9
Santander Indizado SA DE CV SIRV	0.23671	10
Activariable SA DE CV SIRV B	0.23245	11

5.6.3 Results of the Treynor ratio for Mexico

Table 56 shows the performance of the Treynor ratio. A fund with a higher Treynor ratio indicates that the fund has a better risk-adjusted return compared to a fund with a lower Treynor ratio. A higher Treynor ratio implies that funds have better performances. The TGBM Fondo de Inversion Modelo SA DE CV SIRV, the Apolo Indizado SA DE CV SIRV A and the IXE Comun SA DE CV SIRV A have the highest performances for the Treynor ratio. The Activariable SA DE CV SIRV B, the Santander Indizado SA DE CV SIRV and the Principal RV A1 SA DE CV SIRV have the lowest Treynor ratios.

Table 56. Results of the Treynor Ratio for Mexican Funds

Fund Name	Treynor	Rank
GBM Fondo de Inversion Modelo SA DE CV SIRV	0.00990	1
Apolo Indizado SA DE CV SIRV A	0.00906	2
IXE Comun SA DE CV SIRV A	0.00758	3
Actipatrimonial SA DE CV B	0.00746	4
Citiacciones Patrimonial SA DE CV SIRV	0.00726	5
Sura Patrimonial SA DE CV SIRV	0.00717	6
BBVA Bancomer Patriominial SA CV B	0.00689	7
Norteselectivo SA DE CV	0.00684	8
Principal RV A1 SA DE CV SIRV	0.00681	9
Santander Indizado SA DE CV SIRV	0.00658	10
Activariable SA DE CV SIRV B	0.00635	11

5.6.4 Results of Jensen's alpha for Mexico

Table 57 shows the results of Jensen's alpha measure that indicates the selectivity skills of fund managers. Fund managers have either a higher performance or a lower performance relative to the market. Eleven of the 11 funds have positive alphas and 7 of them – the GBM Fondo de Inversion Modelo SA DE CV SIRV, the Apolo Indizado SA DE CV SIRV A, the Sura Patrimonial SA DE CV SIRV and the IXE Comun SA DE CV SIRV A are statistically significant at the 1% level; the Actipatrimonial SA DE CV B and the Principal RV A1 SA DE CV SIRV are statistically significant at the 5% level; and the Citiacciones Patrimonial SA DE CV SIRV is statistically significant the 10% level – are both positive and statistically significant. Unlike other emerging markets, Mexican fund managers have selectivity skills.

Table 57. Results of Jensen's Alpha for Mexico

Fund Name	Jensen's alpha	t-stat	p-value
GBM Fondo de Inversion Modelo SA DE CV SIRV***	0.00319	4.44413	0.00001
Apolo Indizado SA DE CV SIRV A***	0.00252	2.82618	0.00502
IXE Comun SA DE CV SIRV A***	0.00166	2.67244	0.00794
Actipatrimonial SA DE CV B**	0.00152	2.22088	0.02710
Sura Patrimonial SA DE CV SIRV***	0.00144	2.65218	0.00842
Citiacciones Patrimonial SA DE CV SIRV*	0.00142	1.84921	0.06540
Principal RV A1 SA DE CV SIRV**	0.00110	1.99882	0.04652
BBVA Bancomer Patriominial SA CV B	0.00109	1.46326	0.14444
Norteselectivo SA DE CV	0.00109	1.36335	0.17379
Santander Indizado SA DE CV SIRV	0.00087	1.18590	0.23659
Activariable SA DE CV SIRV B	0.00070	1.03867	0.29979

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.6.5 Results of the Sortino ratio for Mexico

The Sortino ratio has to do with returns that decrease below a user-specific minimum or the required rate of return (minimum accepted return, or MAR). In other words, it measures the excess return against the risk of not meeting the minimum return. A high Sortino ratio is better than a low Sortino ratio because a high Sortino ratio denotes low downside volatility compared to the expected return. Table 58 shows the results of the Sortino ratio. The GBM Fondo de Inversion Modelo SA DE CV SIRV, the Apolo Indizado SA DE CV SIRV A and the IXE Comun SA DE CV SIRV A have the highest Sortino ratios. The Activariable SA DE CV SIRV B, the Santander Indizado SA DE CV SIRV, and the Norteselectivo SA DE CV have the lowest Sortino ratio performances.

Table 58. Results of the Sortino Ratio for Mexico

Fund Name	Sortino	Rank
GBM Fondo de Inversion Modelo SA DE CV SIRV	0.06581	1
Apolo Indizado SA DE CV SIRV A	0.05790	2
IXE Comun SA DE CV SIRV A	0.04800	3
Actipatrimonial SA DE CV B	0.04658	4
Sura Patrimonial SA DE CV SIRV	0.04602	5
Citiacciones Patrimonial SA DE CV SIRV	0.04382	6
Principal RV A1 SA DE CV SIRV	0.04304	7
BBVA Bancomer Patriominial SA CV B	0.04063	8
Norteselectivo SA DE CV	0.04056	9
Santander Indizado SA DE CV SIRV	0.03894	10
Activariable SA DE CV SIRV B	0.03858	11

5.6.6 Results of the M^2 (Modigliani & Modigliani) ratio for Mexico

Table 59 displays results of the M^2 measure. Higher M^2 implies that funds have a better performance. The GBM Fondo de Inversion Modelo SA DE CV SIRV, the Apolo Indizado SA DE CV SIRV A and the IXE Comun SA DE CV SIRV A have the highest M^2 ratios. The Activariable SA DE CV SIRV B, the Santander Indizado SA DE CV SIRV, and the Norteselectivo SA DE CV have the lowest M^2 performances.

Table 59. Results of the M^2 ratio for Mexico

Fund Name	M^2	Rank
GBM Fondo de Inversion Modelo SA DE CV SIRV	0.00611	1
Apolo Indizado SA DE CV SIRV A	0.00511	2
IXE Comun SA DE CV SIRV A	0.00400	3
Actipatrimonial SA DE CV B	0.00396	4
Sura Patrimonial SA DE CV SIRV	0.00354	5
Citiacciones Patrimonial SA DE CV SIRV	0.00337	6
Principal RV A1 SA DE CV SIRV	0.00319	7
BBVA Bancomer Patriominial SA CV B	0.00311	8
Norteselectivo SA DE CV	0.00280	9
Santander Indizado SA DE CV SIRV	0.00276	10
Activariable SA DE CV SIRV B	0.00265	11

5.6.7 Results of the Treynor & Mazuy regression analysis for Mexico

The Treynor & Mazuy (1966) analysis analyzes the market timing ability of fund managers. If fund managers believe that the market is going up, they change their portfolio composition from less volatile to high volatile securities. When the market is going down, they shift their portfolio composition from high volatile to less volatile securities. If fund managers have market timing ability, they create their portfolios according to their estimates of the tendency of the markets. Table 60 denotes the results of the Treynor & Mazuy (1966) method. Nine of the 12 funds have positive results, but only the Norteselectivo SA DE CV is statistically significant at the 10% level while the Apolo Indizado SA DE CV SIRV at the 1% level. In other words, fund managers did not have market timing ability during the quantitative easing policy era.

Table 60. Results of the Treynor & Mazuy Regression Analysis for Mexico

Fund Name	T & M	t-stat	p-value
Apolo Indizado SA DE CV SIRV***	1.01966	3.18023	0.00162
Norteselectivo SA DE CV*	0.50779	1.73997	0.08288
Citiacciones Patrimonial SA DE CV SIRV	0.18375	0.65334	0.51403
Actipatrimonial SA DE CV	0.17805	0.71101	0.47763
IXE Comun SA DE CV SIRV	0.16037	0.70720	0.47999
GBM Fondo de Inversion Modelo SA DE CV SIRV	0.12279	0.46871	0.63961
Activariable SA DE CV SIRV	0.10463	0.42577	0.67058
Santander Indizado SA DE CV SIRV	0.10202	0.38082	0.70361
BBVA Bancomer Patriominial SA CV	0.07580	0.27877	0.78061
Principal RV A1 SA DE CV SIRV	-0.04677	-0.23293	0.81597
Sura Patrimonial SA DE CV SIRV	-0.22534	-1.13557	0.25704

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.6.8 Results of the Henriksson & Merton regression analysis for Mexico

Another approach for market timing ability is the Henriksson & Merton (1984) regression analysis method. Market timing ability allows fund managers to forecast

whether returns of funds will be higher than the risk-free rate or vice versa. Table 61 shows the result of Henriksson & Merton (1981) method. According to results, one of the 12 funds is positive but statistically insignificant. The other 11 funds are negative and statistically insignificant. Mexican fund managers did not have market timing ability during the study period.

Table 61. Results of the Henriksson & Merton Analysis for Mexico

Fund Name	H & M	t-stat	p-value
Norteselectivo SA DE CV	0.00274	0.08129	0.93527
Apolo Indizado SA DE CV SIRV	-0.00952	-0.25469	0.79913
IXE Comun SA DE CV SIRV	-0.01397	-0.53665	0.59191
GBM Fondo de Inversion Modelo SA DE CV SIRV	-0.02060	-0.68567	0.49344
Principal RV A1 SA DE CV SIRV	-0.02560	-1.11372	0.26629
Sura Patrimonial SA DE CV SIRV	-0.02923	-1.28484	0.19983
Actipatrimonial SA DE CV	-0.03449	-1.20247	0.23012
Citiacciones Patrimonial SA DE CV SIRV	-0.03897	-1.20989	0.22727
Santander Indizado SA DE CV SIRV	-0.03963	-1.29269	0.19711
Activariable SA DE CV SIRV	-0.04038	-1.43681	0.15181
BBVA Bancomer Patriominial SA CV	-0.04088	-1.31429	0.18974

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

CHAPTER 6

CONCLUSION

In this study, the mutual fund performances of six emerging markets' equity funds – those of Turkey, Poland, India, South Africa, Taiwan, and Mexico- are analyzed over the period between January 9, 2009 and October 31, 2014, which follows the global financial crisis of 2008 and was an era of quantitative easing (QE). During the QE era, the Fed increased the money supply to lower interest rates and this surplus of money in financial markets contributed to capital flows from developed countries to developing countries. Our study period overlaps with the QE era when stock market sizes increased dramatically. Six emerging countries – Turkey, Poland, South Africa, Taiwan, India, and Mexico – were studied. These countries had total mutual fund sizes ranging between 14 billion USD and 150 billion USD. There are different types of funds such as equity, mixed, bonds and so on. This study only evaluates the performances of equity funds since these funds include more stock shares in their portfolios, which hold more risk and are more volatile against internal and external factors. In the study, a total of 73 equity funds from six different emerging countries (11 Turkish equity funds, 14 Polish equity funds, 15 Taiwanese equity funds, 10 South African equity funds, 12 Indian equity funds, and 11 Mexican equity funds) are evaluated. These funds are chosen according to the net asset values of the equities and investment companies. Borsa Istanbul (Turkey), the Warsaw Stock Exchange (Poland), the Johannesburg Stock Exchange (JSE), the Taiwanese Stock Exchange (Taiwan), the CNX500 Index (India) and the Mexican Stock Exchange (Mexico) are selected as benchmark indices. The TKYD O/N Net Repo Index (Turkey), the 3-Month Zloty Deposit Rate (Poland), 91-Day T-bills (South Africa), the 1-Month Deposit Rate (Taiwan), 364-Day T-bills (India) and 91-Day T-

bills (Mexico) are their corresponding risk-free rates. In order to analyze mutual funds, the Sharpe (1966), Treynor (1965), Jensen's alpha (1968), Sortino (1994) and M^2 (1996) ratios are used. Jensen's alpha also identifies the selectivity skills of fund managers. In order to test mutual fund managers' market timing ability, the Treynor & Mazuy (1966) and Henriksson & Merton (1981) methods are used.

Comparing equity fund returns with their benchmark indices, returns of Taiwanese, South African, Indian and Mexican funds are higher than their benchmarks as shown on Figure 62. However, Turkish and Polish equity funds' average returns are less than their benchmarks (the BIST100 and the WSE, respectively). *R* shows the average correlation of equity funds with their benchmarks. As expected, there is a strong positive correlation relationship between funds and their benchmarks.

The betas of all funds – except Taiwanese funds - are in general less than 1, implying that these funds carry less risk compared to their benchmarks. Unlike the others, the betas of Taiwanese funds are either close to 1 or more than 1, which makes them more aggressive and riskier and more directly affected by market movements.

For risk-adjusted performances, the Sharpe (1966), Treynor (1965), Sortino (1994) and M^2 (1996) ratios are computed as indicated in Figure 63. In general, these risk-adjusted performance ratios give similar rankings of mutual funds in each country. In Turkey, the Strateji Securities A-Type Equity Fund, the Alternatif Bank A-Type Equity Fund and the Finansbank A Type Equity Fund have the highest performances. In Poland, the Aviva Investors Polskich, the Uni Korona Akcje and the KBC Akcyjny have the highest performances. In Taiwan, the Allianz Global

Investors Taiwan Fund, the UPAMC All Weather Fund and the Capital OTC Fund have the highest performances. In South Africa, the Foord Equity Fund, the Allan Gray Equity Fund and the Aylett Equity Fund have the highest performances. In India, the ICICI Prudential Dynamic Plan Growth, the UTI Equity Fund Growth and the Religare Invesco Growth Fund have the highest performances. Finally, in Mexico, the GBM Fondo de Inversion Modelo SA DE CV SIRV, the Apolo Indizado SA DE CV SIRV A and the IXE Comun SA DE CV SIRV A have the highest risk-adjusted performances.

Jensen (1968) alphas computed for these funds show that fund managers in general do not have forecasting abilities in all six emerging countries, as only 19 out of 73 funds have positive and statistically significant alphas as displayed in Figure 64. This finding is similar to the results of earlier studies. However, country-specific performance evaluations suggests that Indian and Mexican fund managers have higher selective abilities, as 7 out of 12 Indian funds - the DSP Blackrock Equity Growth, the Religare Invesco Growth Fund, the SBI Magnum Equity Fund, the ICICI Prudential Dynamic Plan Growth, the UTI Equity Fund Growth, the Religare Invesco Growth Fund and the L & T Equity Growth Fund - and 7 out of 11 Mexican funds - the GBM Fondo de Inversion Modelo SA DE CV SIRV, the Apolo Indizado SA DE CV SIRV A, the Sura Patrimonial SA DE CV SIRV, the IXE Comun SA DE CV SIRV A, the Actipatrimonial SA DE CV B, the Principal RV A1 SA DE CV SIRV and the Citiacciones Patrimonial SA DE CV SIRV - had positive and statistically significant alphas. Other than these Mexican and Indian funds only two Turkish, two South African, and one Taiwanese fund had positive and statistically significant alphas.

The regression analysis of Treynor & Mazuy (1966) indicates the market timing ability of fund managers. As seen in Figure 65, only 4 of 73 funds have market timing ability: one from Turkey (the Eczacıbaşı A-Type Equity Fund), one from India (the SBI Magnum Equity Growth) and two funds from Mexico (Norteselectivo SA DE CV and Apolo Indizado SA DE CV SIRV). No significant market timing ability for Polish, Taiwanese or South African funds could be traced. As seen in Figure 66, according to the regression analysis of Henriksson & Merton (1981), no funds show statistically significant results. As previous findings in literature have found, fund managers could not show market timing ability during the quantitative easing era. The results of the Treynor & Mazuy (1966) regression analysis are better than Henriksson & Merton (1981) regression analysis as exhibited in Figure 67.

According to the findings, while Mexican funds and fund managers had the highest performances, Polish funds and fund managers had the lowest performances during the quantitative easing era.

To the best of our knowledge this is the first study that investigates how emerging markets' funds performed in the recent quantitative easing era. The object of this analysis is to fill this void and to contribute further analyses. In future, this study can be developed using persistence analysis. At the same time, although other research on the comparative analysis of the investment funds of countries exists, there are no examples of this type of work in Turkey. This research, among other things, is designed to fill a gap in the financial literature of Turkey.

APPENDIX

SUMMARY TABLES

Table 62: Descriptive Statistics of Equity Funds and Benchmark Indices

Mutual Funds	# of funds	average	std. dev	*R*	Beta
Turkish Funds	11	0,0035	0,02829	0,93077	0,77159
Polish Funds	14	0,00124	0,02362	0,9365	0,86038
Taiwanese Funds	15	0,00253	0,02632	0,89363	0,97168
South African Funds	10	0,00281	0,01831	0,88298	0,76478
Indian Funds	12	0,00385	0,02558	0,95925	0,86507
Mexican Funds	11	0,00269	0,02281	0,86622	0,83532
Benchmarks					
Borsa Istanbul (BIST100)		0,0036	0,03441	1	
Warsaw Stock Exchange (WSE)		0,00225	0,02562	1	
Taiwan Stock Exchange (TWSE)		0,0022	0,02413	1	
Johannesburg Stock Exchange (JSE)		0,00272	0,02119	1	
National Stock Exchange(CNX500)		0,0034	0,0284	1	
Mexican Stock Exchange (BOLSA)		0,00217	0,02591	1	

Table 63. Results of Risk Adjusted Performances

Risk-Adjusted Performances				
	Sharpe Ratio	Treynor Ratio	Sortino Ratio	M^2 Ratio
Turkey	0.14320 – 0.04749	0.00561 – 0.00168	0.02616 – 0.00742	002473 – 0.00285
Poland	0.05942 - (0.07462)	0.00160 - (0.00305)	0.01047 - (0.01173)	0.00224 - (0.0119)
Taiwan	0.06924 - (0.02453)	0.00190 - (0.00071)	0.01133 - (0.00361)	0.00347 – 0.00120
South Africa	0.12015 – 0.04016	0.00302 – 0.00093	0.02214 – 0.00638	0.00366 – 0.00197
India	0.01290 – 0.05465	0.00384 – 0.00159	0.02342 – 000888	0.00501 – 0.00289
Mexico	0.36623 – 0.23245	0.00990 – 0.00635	0.06581 – 0.03858	0.00611 – 0.00265

Table 64. Results of Jensen's alpha

Jensen's alpha							
Mutual Funds	# of funds	α	t-stat	# of positive alpha	# of positive statistically significant		
					*	**	***
Turkish Funds	11	0.00045	0.62922	7	0	1	1
Polish Funds	14	-0.0008	-1.99800	2	0	0	0
Taiwanese Funds	15	0.00034	0.40596	11	0	1	0
South African Funds	10	0.00048	0.98573	9	0	0	2
Indian Funds	12	0.00073	1.96070	11	1	3	3
Mexican Funds	11	0.00151	2.15591	11	1	2	4

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

Table 65. Results of the Treynor & Mazuy Regression Analysis

Treynor&Mazuy Regression Analysis							
Mutual Funds	# of funds	T&M	t-stat	# of Positive β_{i1}	# of positive statistically significant		
				*	*	**	***
Turkish Funds	11	-0.42442	-0.99508	5	1	0	0
Polish Funds	14	-0.70539	-2.20036	2	0	0	0
Taiwanese Funds	15	-0.72754	-1.29938	2	0	0	0
South African Funds	10	-0.43909	-0.69611	3	0	0	0
Indian Funds	12	0.00629	-0.07874	8	0	0	1
Mexican Funds	11	0.19843	0.65248	9	1	0	1

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

Table 66. Results of the Henriksson & Merton Regression Analysis

Henriksson&Merton Regression Analysis							
Mutual Funds	# of funds	H&M	t-stat	# of Positive γ_{i1}	# of positive statistically significant		
				*	*	**	***
Turkish Funds	11	0.04925	0.18167	5	0	0	0
Polish Funds	14	-0.03372	-1.25663	1	0	0	0
Taiwanese Funds	15	-0.03298	-0.72224	2	0	0	0
South African Funds	10	-0.02361	-0.60723	1	0	0	0
Indian Funds	12	-0.02641	-0.93186	6	0	0	0
Mexican Funds	11	0.19843	0.65248	1	0	0	0

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

Table 67: Results of Selectivity Skills and Market Timing Ability

		Selectivity Skills	Market Timing Ability	
		Jensen's alpha	T&M	H&M
	# of funds	Positive Statistically Significant		
Turkey	11	2	1	0
Poland	14	0	0	0
Taiwan	15	1	0	0
South Africa	10	2	0	0
India	12	7	1	0
Mexico	11	7	2	0

REFERENCES

Akel, V. (2007). Türkiye'deki A ve B tipi yatırım fonları performansının devamlılığının parametrik ve parametrik olmayan yöntemlerle değerlendirilmesi. *Dokuz Eylül Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 2*, 147-177.

Akgüç, Ö. (1989). Finansal Yönetim (Revised and Expanded 5th Edition). Istanbul: Muhasebe Enstitüsü Yayınları.

Akmut, Ö. (1989). Sermaye Piyasası Analizleri ve Portföy Yönetimi, Ankara.

Arslan, M. (2005). A tipi yatırım fonlarında yöneticilerin zamanlama kabiliyeti ve performans ilişkisi analizi: 2002-2005 dönemi bir uygulama. *Gazi Üniversitesi Ticaret ve Turizm Eğitim Fakültesi Dergisi, 2(2),* 1-23.

Arslan, M. & Arslan, S. (2009). Yatırım fonu performans ölçütleri, regresyon analizleri ve MANOVA yöntemine göre A, B ve Borsa yatırım fonlarının karşılaştırmalı analizi. *İşletme Araştırmaları Dergisi,* 2(2), 3-20.

Arslan, M. & Arslan, S. (2009). Yatırım fonu performans ölçütleri, regresyon analizleri ve MANOVA yöntemine göre A, B ve Borsa yatırım fonlarının karşılaştırmalı analizi. *İşletme Araştırmaları Dergisi,* 2(2), 3-20.

Białkowski, J. & Otten, R. (2011). Emerging mutual fund performance: Evidence for Poland. *North American Journal of Economics and Finance*, 22, 118-130.

Blake, C. R., Elton, E. J., & Gruber, M. J. (1993). The performance of bond mutual funds. *The Journal of Business,* 66(3), 371-403.

Bodie, Z., Kane, A., & Marcus, A. J. (1999). *Investment* (4th.edition) Irwin/McGraw-Hill.

Business risk. Retrieved from May 3, 2015 from http://www.investopedia.com/terms/b/businessrisk.asp

Cesari, R. & Panetta, F. (2002). The performance of Italian equity funds. *Journal of Banking and Finance*. 26(1), 99-126.

Ceylan A. & Korkmaz T. (1998). Borsa'da uygulamalı portföy yönetimi (3rd. edition). Bursa: Etkin Kitabevi Yayınları.

Chamber of Fund and Asset Management (2015). The classification of investment funds. Retrieved January 3, 2015 from http://www.izfa.pl/en/index.php?id=10024

Chang, E., & Lewellen, W. (1984). Market timing and mutual funds investment performance. *Journal of Business,* 57, 57-72.

Chen, D., Gan. C. & Hu, B. (2013, February 18). An empirical study of mutual funds performance in China. *Social Science Research Network.* Retrieved January 10, 2015 from SSRN: http://ssrn.com/abstrat=2220323

Christensen, M. (2005). Danish mutual fund performance; Selectivity, market timing and persistence. *Working Paper, Department of Accounting, Finance and Logistics, Aarhus School of Business,* 1-37.

Citibank Report (2014). Taiwan-Asia's Mutual Funds Giant. *Citibank Webpage*. Retrieved December 15, 2014 from https://www.citibank.com/mss/docs/1188840_taiwan_asias_mutual_funds_giant_ss.pdf

Close-end fund information. Retrieved from May 02, 2015 from www.sec.gov/answers/mfclose.htm

CNX500 (2014). Retrieved from October 25, 2014 from http://www.nseindia.com/products/content/equities/indices/cnx_500.htm

Coggin, T. D., Fabozzi, F. J. & Rahman, S. (1993). The investment performance of U.S. equity pension fund managers: An empirical investigation. *The Journal of Finance,* 48(3), 1039-1055.

Dahlquist, M., Engström, S., & Söderlind, P. (2000). Performance and characteristics of Swedish mutual funds. *Journal of Financial and Quantitative Analysis*, 35, 409-423.

Deepak, A. (2011, June). Measuring performance of Indian mutual funds. *Social Science Research Network*. Retrieved November 15, 2014 from SSRN: http://ssrn.com/abstract=131761

Detzler, M. L. (1999). Performance of global bond mutual funds. *Journal of Banking & Finance,* 23, 1195-1217.

Duggimpudi, R. R., Abdou, H. A., & Zaki, M. (2010). An evaluation of equity diversified mutual funds: the case of the Indian market. *Investment Management and Financial Innovations,* 7(4), 77-84.

Elton, E. J, Gruber, M. J., Brown, S. J., & Goetzmann, W. N. (2003). *Modern portfolio theory and investment* analysis (6th Edition). John Wiley & Sons, Inc.

Elton, E. J., & Gruber, M. J. (2011). Mutual Funds. *Working Paper Series*, *New York University*, 1-82.

Endeks Hesaplama Yöntemleri. (2014) Retrieved October 20, 2014 from http://www.tkyd.org.tr/T/endex_hesaplama_yont.aspx.

Fundusze Inwestycyjne Analizy Online. (2015). Retrieved February 13, 2015 from http://www.analizy.pl/fundusze/ .

Gallo, J, G., & Swanson, P. E. (1996). Comparative measures of performance for U.S. – based international equity mutual funds. *Journal of Banking & Finance,* 20, 1636-1650.

Global financial stability report. Retrieved May 15, 2015 from https://www.imf.org/external/pubs/ft/gfsr/2014/02/pdf/c2.pdf

Gökgöz, F. & Günel, M. O. (2012). Türk yatırım fonlarının portföy performanslarının analizi. *Ankyra: Ankara Üniversitesi Sosyal Bilimler Enstitüsü Dergisi,* 3(2), 3-25.

Gürsoy, T. C., & Erzurumlu, Y. Ö. (2001). Evaluation of portfolio performance of Turkish investment funds. *Doğuş Üniversitesi Dergisi*, 4, 43-58.

Henriksson, R. D., & Merton, R. C. (1981). On market timing and investment performance. II. Statistical procedures for evaluating forecasting skills. *The Journal of Business,* 54(4), 513-533.

Henriksson, R. D. (1984). Market timing and mutual fund performance: An empirical investigation. *The Journal of Business,* 57(1), 73-96.

Hsu, L. C., Ou, S. L., Yang, C.C. & Ou, Y. C. (2012). How to choose mutual funds that perform well? Evidence from Taiwan. *International Journal of Economics and Finance,* 4(1), 247-259.

Hou, T.C.T. (2012). Return persistence and investment timing decisions in Taiwanese domestic equity mutual funds. Managerial Finance, 38(9), 873-891.

Investment company fact book 2014. Retrieved May 15, 2015 from http://www.icifactbook.org/pdf/2014_factbook.pdf

Investment Company Institute (ICI) -Unit investments trust data. Retrieved from February, 15, 2015 from http://www.ici.org/research/stats

Ippolito, R. A., (1989). Efficiency with costly information: A study of mutual fund performance, 1965-1984. *The Quarterly Journal of Economics*, 104(1), 1-23.

Jensen, M.C. (1968). The performance of mutual funds in the period 1945-1964. The *Journal of Finance,* 23(2), 389-416.

Karatepe, Y. & Karacabey, A. (2000). A tipi yatırım fonları performansının yeni bir yöntem kullanılarak değerlendirilmesi: Graham-Harvey performans testi. *Ankara Üniversitesi SBF Dergisi, 55(2),* 55-67.

Kılıç, S. (2002). *Türkiye'deki yatırım fonlarının performans değerlendirilmesi*. İstanbul: İMKB Yayınları.

Kremnitzer, K. (2012). *Comparing active and passive fund management in emerging markets*. Unpublished master's thesis. University of California, Berkeley, USA.

Korkmaz, T. & Uygurtürk, H. (2009). Türkiye'de işlem gören hisse senedi ağırlıklı yatırım fonlarının performans karşılaştırması. *Kilis 7 Aralık Üniversitesi İktisadi ve İdari Bilimler Fakültesi Akademik Araştırmalar ve Çalışmalar Dergisi*, 1, 1-15.

Kouris, A., Beneki, C., Adam, M. & Botsaris, C. (2011). An assessment of the performance of Greek mutual equity funds selectivity and market timing. *Applied Mathematics Sciences*, 5(4), 159-171.

List of countries by GDP (nominal). Retrieved January 15, 2015 from http://en.wikipedia.org/wiki/List_of_countries_by_GDP_(nominal)#cite_note-6

Lu, M. & Zhao, Y. (2005). *Mutual fund performance-An empirical analysis of China's mutual fund market.* Unpublished master's thesis, Göteborg University School of Business, Economics and Law, Göteborg, Sweden.

Malkiel, B, G. (1995). Returns from investing in equity funds: 1971-1991. *Journal of Finance*, 50, 549-572.

Management risk (n.d.). Definition of management risk. Retrieved from April 29, 2015 from www.investopedia.com/terms/m/managementrisk.asp

Manjezi, L. (2012). *Portfolio performance evaluation of South African mutual funds 2001-2006*. Unpublished master's thesis. University of Agder, Kristiansand, Norway.

Market risk (n.d). Retrieved from April 27, 2015 from www.investinganswers.com/financial-dictionary/investing/market-risk-2360

Mayo, H. B. (2011). *Introduction to Investments* (10th. Edition). USA: Mason. Southwestern Cengage Learning.

McDonald, J. G. (1973). French mutual fund performance: Evaluation of internationally-diversified portfolios. *The Journal of Finance*, 28(5), 1161-1180.

Mutual fund rankings. (2014). Retrieved October 21, 2014 from https://www.baanmoney.com/mutual_funds/rankings.

Mutual funds-guide for investors. Retrieved May 15, 2015 from https://www.sec.gov/investor/pubs/sec-guide-to-mutual-funds.pdf

Net asset value of Indian mutual funds. (2014). Retrieved October 22, 2014 from https://www.amfiindia.com/net-asset-value

Noulas, G., Papanastation, J. A. & Lazaridis, J. (2005). Performance of mutual funds. *Managerial Finance*, 31(2), 101-112.

Omağ, A. (2010). Türkiye'de A tipi ve B tipi yatırım fonlarının 2000-2008 dönemi performans analizi. *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi*, 9(16), 235-250.

Quantitative easing. (2015). Retrieved January 23, 2015 from http://en.wikipedia.org/wiki/Quantitative_easing

Political risk. Retrieved May 3, 2015 from http://financial-dictionary.thefreedictionary.com/Political+Risk

Prajapati, K. P., & Patel, M. K. (2012). Comparative study on performance evaluation of mutual fund schemes of Indian companies. *Journal of Arts, Science & Commerce*, 3(3), 47-59.

Purchasing power risk (20011). Financial Glossary. Retrieved April 27, 2015 from http://financial-dictionary.thefreedictionary.com/purchasing+power+risk

PLC investment funds: Mexico. Retrieved February 25, 2015 from http://www.vonwobeserysierra.com/assets/files/PDF/marzo2013_/7_PLC_Investment_Funds.pdf

Rao, D. N. (2006, August 6). Investment styles and performance of equity mutual funds in India. *Social Science Research Network*. Retrieved November 15, 2014 from SSRN: http://ssrn.com/abstract=922595 or http://dx.doi.org/10.2139/ssrn.922595

Reilly, F, R. (1992). *Investments* (3rd. edition). Orlando, Florida: The Dryden Press.

Sapar, N. R. & Madava R. (2003). Performance Evaluation of Indian Mutual Funds. Retrieved January 12, 2015 from SSRN: http://ssrn.com/abstract=433100 or http://dx.doi.org/10.2130/ssrn.433100

Sharad, P. & Ranganatham, M. (2005). Characteristics and performance evaluation of selected mutual funds in India. *Social Science Research Network.* Retrieved November 16, 2014 from SSRN: http://ssrn.com/abstract=876402 or http://dx.doi.org/10.2139/ssrn.876402

Sharpe, W. F. (1966). Mutual fund performance. *Journal of Business*, 34, 119-138.

SITCA Fund Information Taiwanese Funds. Retrieved February, 15, 2015 from http://www.sitca.org.tw/ENG/FundInf/FI2001.aspx?PGMID=FI2001

South African equity. Retrieved February 18, 2015 from http://www.fundsdata.co.za/navs/ZEGN.htm

South African unit trust prices. Retrieved February 17, 2015 from http://www.sharenet.co.za/free/ut.phtml

SPK yatırım fonları portföy değerleri. Retrieved January, 18, 2015 from http://www.spk.gov.tr/apps/MutualFundsPortfolioValues/FundsInfos.aspx?ctype=T&submenuheader=0

SPK konsolide bilgiler. Retrieved January 22, 2015 from http://www.spk.gov.tr/apps/MutualFundsPortfolioValues/index.aspx?type=mkyf&submenuheader=-1

Swinkels, L. & Rzezniczak, P. (2009). Performance evaluation of Polish mutual fund managers. *International Journal of Emerging Markets,* 4, 26-42.

Treynor, J. L. (1965). How to rate management of investment funds. *Harvard Business Review*, 1965, 43(1), 131-136.

Treynor, J. L. & Mazuy, K.K. (1966). Can mutual funds outguess the market? *Harvard Business Review*, 44, 131-136.

Tripathy, N. P. (2005). An empirical evaluation of market timing abilities of Indian fund managers on equity linked savings scheme. *Delhi Business Review*, 6(2), 19-27.

Unit trust fund prices. Retrieved from January 17, 2015 from http://www.equinox.co.za/unittrusts/funds/default.asp

Wang, C.C. & Venezia, C.C. (2012). The effect of market structure on mutual fund performance in Taiwan. *International Business & Economics Research Journal*. 11(5), 487-496.

What is quantitative easing? Definition and explanation. Retrieved January 23, 2015 from http://useconomy.about.com/od/glossary/g/Quantitative-Eaing.htm.

What is quantitative easing? Retrieved May 14, 2015 from http://www.bbc.com/news/business-15198789

Worldwide mutual fund assets and flows fourth quarter 2014. Retrieved May 16, 2015 from http://www.ici.org/research/stats/worldwide/ww_12_14

Yalçın, Ö. (2012). *The performance evaluation and persistence of A type mutual funds in Turkey*. Unpublished master's thesis, Middle East Technical University, Ankara, Turkey.

Yıldız, A. (2005). A Tipi yatırım fonları performanslarının IMKB ve fon endeksi bazında değerlendirilmesi. *Muğla Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 14, 185-202.