

**Fund styles and the risk-adjusted performance
evaluation of Mutual Funds in the period of 2009-
2014 in Turkey**



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ABSTRACT

This study attempts to evaluate performance of Type A and Type B mutual funds comparing its specific benchmark starting from January 2010 to January 2015 in Turkey. it was aimed to show guidance to the individual investors and banking, investment and financial institutions as well as portfolio and fund managers due to increasing complexity of investment instrument and to provide an explicit understanding of how performance evaluation can be done and how performance analysis can be utilised before taking a sound investment decision or strategy.

Employing different kind of 10 Type A and 10 Type B mutual funds, the traditional risk-adjusted measures are applied in this study. Risk-adjusted measures can be lined up as Sharpe Ratio, Treynor measure, Jensen's Alpha and Sortino Ratio in this study. Bloomberg Professional are utilised to complement data collection process perfectly. The result demonstrates that similar findings are revealed between previous researches and this study. The findings of Sharpe Ratio imply that neither Type A nor Type B funds could generate consistently acceptable return-reward, although few high Sharpe Ratio are encountered over the five years period. Based on overall Treynor measure results, average both Type A and Type B fund managers could not earn abnormal return except from only three Type A fund in the period 2010 and 2014. Therefore, both Types of fund strategy might be assumed defensive rather than offensive against the market risk. Neither Type A nor Type B funds could outperform the market value and remarkable inconsistency was observed result in Jensen Alpha apart from superior performance of a few Type A fund. Type A fund's Sortino results were much more higher and more positive than Type B funds. Overall, the performance of Type A funds better than Type B funds. However, whether performance of Type A funds can be supposed successful or not is a discussion point and also, the amount of Type B investors which was higher than Type A but, its performance still arguable point.

TABLE OF CONTENTS

ABSTRACT	ii
TABLE OF CONTENTS	iii
GLOSSARY OF TERMS	iv
LIST OF FIGURES AND TABLES	v
CHAPTER 1	1
INTRODUCTION	1
1.1 Definition and importance of mutual funds	1
1.2 Aim of the study	2
1.3 Method of the study	3
1.4 The importance of performance measurement ratios	4
CHAPTER 2	7
GENERAL OVERVIEW ON MUTUAL FUND INDUSTRY	7
2.1 The history and current developments in the worldwide	7
2.2 Classification of mutual funds in worldwide	10
2.3 Advantages of Mutual Funds	13
2.4 The fund styles, kinds and main characteristics and holding in Turkey	14
CHAPTER 3	23
LITERATURE REVIEW	23
3.1 Evaluation of portfolio performance	23
3.2 Empirical studies related to performance evaluation methods	27
CHAPTER 4	32
DATA AND METHODOLOGY	32
4.1 Data and Research methodology	32
4.2 Risk-adjusted portfolio performance measures	35
CHAPTER 5	41
DATA ANALYSIS	41
5.1 Findings and Interpretation	41
CHAPTER 6	50
CONCLUSION	50
6.1 Limitations	52
6.2 Recommendations	53
REFERENCES	55

GLOSSARY OF TERMS

CAPM: Capital Asset Pricing Model

CMB: Capital Market Board of Turkey

DEA: Data Envelopment Analysis

ISE: Istanbul Stock Exchange

KYD-GDS 365 index: Institutional Investment Association-Government Debt Security Index

MAR: Minimum Acceptable Ratio

MPT: Modern Portfolio Theory

S&P 500: Standard Poor's 500 indexes

TKYD: Turkish Institutional Investment Managers' Association

LIST OF FIGURES AND TABLES

FIGURES

Figure 1: Total net assets of mutual funds in worldwide	9
Figure 2: The number of mutual funds 2010-2014 across the world	10
Figure 3: Total Net Assets in U.S. Dollars by Type of Funds 2014	12
Figure 4: The amount of mutual funds in the period of 2010-2014 in Turkey	15
Figure 5: Capital Market Institutions as of 2014-end in Turkey	16
Figure 6: Percentage Distributions of Mutual Fund Kinds as of 2014-end in Turkey	18
Figure 7: Net Assets Value of Mutual Funds between 2010 and 2014 in Turkey	19
Figure 8: The Amount of Mutual Fund Investor 2010-2014 in Turkey	20

TABLES

Table 1: Total Portfolio Compositions of Type A Mutual Funds.....	21
Table 2: Total Portfolio Compositions of Type B Mutual Funds.....	22
Table 3: Selected Type A mutual funds for performance evaluation	34
Table 4: Selected Type B mutual funds for performance evaluation	34
Table 5: Risk-adjusted performance results of Type A mutual funds.....	48
Table 6: Risk-adjusted performance results of Type B mutual funds.....	49

CHAPTER 1

INTRODUCTION

"Mutual funds are now the preferred way for individual investors and many institutions to participate in the capital markets, and their popularity has increased demand for evaluations of fund performance." Simons (1998, p34)

1.1 Definition and importance of mutual funds

A mutual fund is a company which pools money from different investors and collectively invests this money in mainly government and corporate bonds, stocks from large companies, stocks from specific countries, foreign securities, short-term money market instruments such as treasury bills or some funds invest in a combination of stocks and bonds or fund of fund. Correspondingly, the combined holdings of the mutual fund is known as its portfolio and each share represents an investor's proportionate ownership of the fund's holding the income those holdings generate (US Securities and Exchange Commission, p4).

There is no doubt that mutual fund industry has developed remarkably for the last a few decades. The key reason of this acceleration can be explain that it provides an important diversification opportunity to investors. The important aspect in here is the fact that managers might able to invest a wide range of investment vehicles lead to reduce possible risk in the portfolio of holding. Different investments react differently to the world events, factors in the economy such as interest rates. Therefore, downing an investment value does not affect considerable due to the fact that there is still another type of vehicles which the value may increase (Canadian Security Administrators, 2009).

1.2 Aim of the study

The subject of this study is to measure the performance of mutual funds types (Type A and Type B) in Turkey considering five years period of time and to figure out the relationship with funds styles in terms of what are these funds investment strategy, discovering whether they are really taking risk to earn abnormal return to the investors, what kind of instrument they are mainly invest, which type of fund are more popular and to investigate the possible feasible reasons why, whether they are really provide a valuable return or which one should be a preference reason before an investment decision.

In addition to this, to find out if the fund managers are adding value on their investment strategy and to assess how well the mutual funds provide return considering risk-adjusted performance ratios and in this direction it is aimed to evaluate their performance between 2010 and 2014.

Undoubtedly, Investors would like to find out as much information as regarding the portfolio performance of funds which will be potentially invested and understand what the performance situation of holdings or what might be a good decision to supply better return from investment strategy.

Additionally, mutual funds' performance not only important for investors but also banking, investment and financial institutions as the investment instruments becoming more attractive in the highly competitive market.

Accordingly, this study is aim to provide an explicit understanding to the investors, portfolio managers and different type of financial institutions considering risk-adjusted performance evaluation tools in the period of 2010-2014.

1.3 Method of the study

The Capital Market of Board Turkey is the most important regulatory and supervisory authority liable for the securities market. The mission of Capital Market Board is to regulate and supervise the capital markets, institutions and investment vehicles in Turkey.

To measure the risk-adjusted performance of Type A and Type B mutual funds, Borsa Istanbul which previously named as Istanbul Stock Exchange is determined as the benchmark index to be able to do performance comparison with Type A mutual funds however, Type B mutual funds benchmarks varied on kind of types which makes easier to do appropriate for making comparison between types and kinds of funds' performance. For instance, Garanti Bank Ottoman Gold funds have specific benchmark called KYD Gold Price Index which only convenience for gold funds to do appropriate evaluation.

Borsa Istanbul was established in late 1985. It has own regulatory authority on its members, yet some important rules are need to be approved by the Capital Market of Board (Alparslan, Gokben and Serhat 2015).

Two different types of mutual fund exist in Turkey respectively Type A and Type B. Type A mutual funds are required to invest at least 25 % of their assets in equities which are issued by Turkish companies, whereas there is no such an obligation in Type B mutual funds (Capital Market Board of Turkey 2013, p54).

The main difference between these two types of mutual fund is that investors who are willing to take more risk to be able to obtain higher return from the investment would like to prefer Type A mutual funds due to holdings of portfolios tend to be weight on stocks on the other hand, Type B mutual funds are more suitable for investors who want to avoid taking risk due to the holdings of portfolios. It mostly holds government bonds or fixed-income products.

1.4 The importance of performance measurement ratios

Despite the fact that investors were aware of risk was also very significant erratic for determining investment success, they used to measured portfolio performance on the rate of return before 1960. The reason for not deeming the risk was the lack of knowledge how to evaluate and identify.

After progressing of portfolio theory in the early 1960s and CAPM (Capital Asset Pricing Model) in following years, risk has measured both beta and standard deviation (Gursoy and Erzurumlu 2001).

As a methodology and to evaluate the performance of mutual funds, traditional risk-adjusted performance measurements methods are applied in this study. These measures are Sharpe Ratio, Sortino Ratio, Jensen's Alpha and Treynor measure.

Charles (2014) alleges the literature on risk-adjusted performance measures started with the ground-breaking study of Sharpe (1966) introducing what is known as the Sharpe Ratio. Having been introduced of Sharpe Ratio, many researchers and practitioners have developed a wide range of measures attempt to mitigate the limitation of Sharpe Ratio. Yet, each alternative measure gathers in for one purpose; the ability to compare the excess return acquired in an investment to the risk exposure.

The significant growth acceleration in mutual fund industry for the last couple of years has also increased the importance of risk-adjustment performance evaluation methods. Charles (2014) asserts that two important reason underlying behind the growth of risk-adjusted performance measures. Firstly, results in rapid developments of mutual funds industry, investors need an instrument to be able to evaluate the performance of different mutual funds managers. In addition to this, with the introduction of Basel II and Basel III Accords, regulatory framework requires banks to comply with the provisions for potential losses owing

to risks incurred. Therefore, the regulatory frameworks requires banks to take into account both risk and performance.

Secondary data is applied in this study. In order to collect secondary data, Bloomberg Professional is employed which some Type B funds might have specific benchmark and each benchmark clearly identified by The Bloomberg Professional. This method also assumed rather efficient to be able to make sound evaluation and to detect convincing findings.

The definition and importance of mutual funds have been discussed in this Chapter. Also, data collection process, the purpose of the study have explicitly summarized in above sections. In below, the process of this study are arranged to give a clear idea concerning in this study.

Chapter 2 does give comprehensive information regarding the background of mutual funds, the current developments in the worldwide, how transformed and how well it becomes much more attractive for investors in time, what type of factors are play key role to be preferred mutual funds relative to other investment options and the general benefits of mutual funds afterwards, classification of mutual funds in the world, what type of mutual funds currently are used beefing up figures and real data then finally, briefly the fund and kind styles in Turkey mutual funds industry, the composition of different types of funds what extend transformed in five years period reinforcing with up to date tables and figures the latest developments in Turkey.

Literature reviews is taken place on Chapter 3. In this part, what types of methods or techniques have been used in worldwide for measuring the performance of mutual funds is identified. Then; to enrich the methodology in this study, similar previous studies and methodologies which have been conducted on previous researches concerning on risk-adjusted methods are suggested both in Turkey and around the world.

Chapter 4 indicates the how data collection process implemented and how well reliable sources utilized systematically in the study, what kind of steps have been taken to inhibit potential mistakes and also, Type A and Type B funds identified then, risk-adjusted portfolio performance measures are clarified why they are essentially important and what are the purposes of using these ratios are assigned in a detail way in the methodology part.

Findings of the study are discussed on Chapter 5. The each ratio results are comprehensively elucidated and the funds are interpreted on a year basis performance. In order to acquire the data, Bloomberg Professional software which all financial and Investment companies data's available is applied to be able evaluate and analyse performance of these mutual funds.

Findings are strengthened with previous researches and instead of carrying out an extensive analysis, summary of findings are taken part in Chapter 6. The aims of the study are associated with the results of previous researches and in a way that it aims to shed light on the investors and financial institutions managers' decisions and also offers a more concrete idea to being able to taken feasible steps in an accurate way.

In addition to this, limitations of this study are identified and what kind of improvement might have been done is discussed and finally, recommendations are taken part showing direction what other type of methodology may have been implemented to beef up the findings of this research in the Chapter 6.

CHAPTER 2

GENERAL OVERVIEW ON MUTUAL FUND INDUSTRY

2.1 The history and current developments in the worldwide

Although the Second World War decelerated the growth of mutual funds industry all over the world, innovations in product types and services incremented the popularity of mutual funds during 1950s and 1960s. The first money market mutual funds and the first tax-exempt municipal bond funds were created in 1979. In this respect, the industry came across considerable growth during 1980s and 1990s due to remarkable rise up in the amount of mutual funds, assets and shareholders (Chetna 2011).

The reasons of significant progress and rapid growth pace during 1990s was also asserted as increasing internationalization of finance, expanding conglomerates associated with financial service in a large number of countries and having been a robust equity and bond market during that years. Additionally, middle and high income countries commenced for searching financial instruments which were secure and liquid (Leora, Victor and Dimitri 2004).

Even it is highly likely to see improvements on the developing countries' mutual funds industry for the last decades. The main factors suggested as the fact that the fast grow on populations, expansion of middle class and investors have explicit understanding the benefits of mutual funds such as providing broad diversification not only in domestic market but also in international market.

After 1990s, the global mutual fund industry sustained the unprecedented growth until the beginning of 2000s. Over those twenty years, assets in the mutual fund industry boosted more as much as sevenfold, from \$4.0 trillion to \$28.9 trillion. This growth was shared across

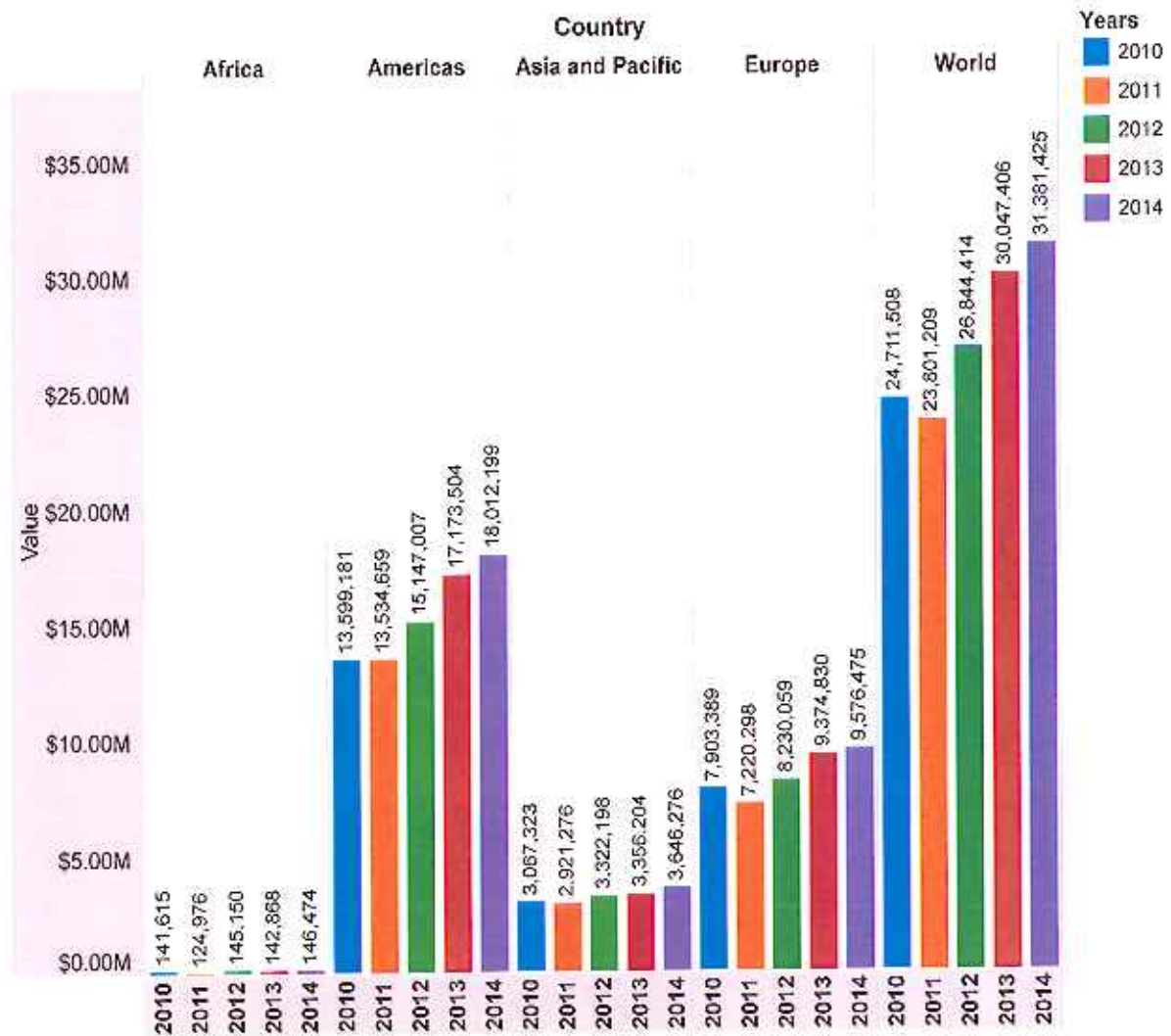
the entire region in the world. For instance, assets in U.S mutual funds increased approximately 600 percent to \$14.3 trillion.

Although the European mutual fund industry much smaller, it showed considerable faster growth by 642 percent to nearly \$9.0 trillion. Asset in the Asia-pacific region enlarged 450 percent to almost \$3.3 trillion. Final point in the rest of the world that including Brazil, Canada and other countries in Latin America expanded 2.200 percent to a level of \$2.3 trillion (Plantier 2014).

As for the last five years developments in the mutual funds industry, there has been substantial increase in the total net asset over the world from 24.7 trillion to \$31.3 trillion between 2010 and 2014 years on Figure (1). Also, the rapid growth can be observed in US and Latin America countries increasing from \$13.5 trillion to \$18.0 trillion for the last five years. The net asset in Europe showed slight rise up starting from \$7.9 trillion in 2010 and reached by \$9.5 trillion in 2014.

The countries which have lowest net total assets were Africa and Asian countries compared to other continents. Africa preserved its net assets over the five years approximately \$1.45 trillion whereas, Asian and Pacific countries total net asset varied between \$3.0 trillion and \$3.5 trillion in the period of 2010-s2014.

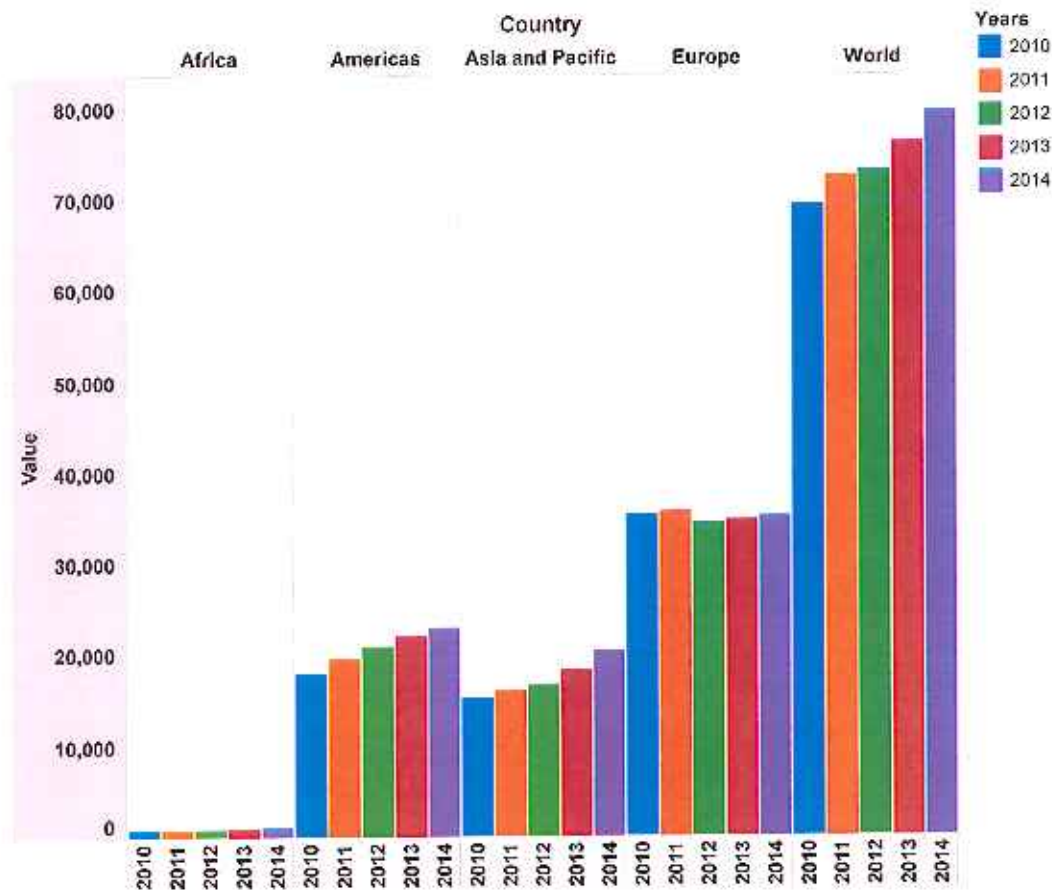
Figure 1: Total net assets of mutual funds in worldwide



Source: International Investment Funds Association

Figure (2) illustrates the number of mutual funds between 2010 and 2014 across the world. Particularly, Americas and Asia and Pacific regions carried importance due to rising up the number of mutual funds trend compared to other regions over the last five years. However, Europe was the region which had highest number of mutual funds having a smooth trend relatively other regions. The increase trend over the worldwide was also significantly increased from 69,492 in 2010 to 79,669 in 2014.

Figure 2: The number of mutual funds 2010-2014 across the world



Source: International Investment Funds Association

2.2 Classification of mutual funds in worldwide

Mutual funds have many types which increase the potential options for investor's decisions. These types have different kind of holdings and investment policies. Most commonly used are Money market funds, Equity funds, Sector funds, Bond funds, International funds and balanced funds.

a) Money market Funds

These types of funds hold the short-term, low-risk instruments of the money market. Fundamentally invest in commercial papers, certificates of deposit and repurchase agreement.

b) Equity Funds

Equity funds invest in principally in stock and commonly hold %4 or %5 of total assets in money market securities to provide adequate liquidity to be able to meet possible redemption of the shares.

c) Bond Funds

These mutual funds are specifically invests in different type of bonds. The primarily aim is to hold fix-income securities. Thus, funds concentrate on corporate bonds, treasury bonds or municipal (tax-free) bonds.

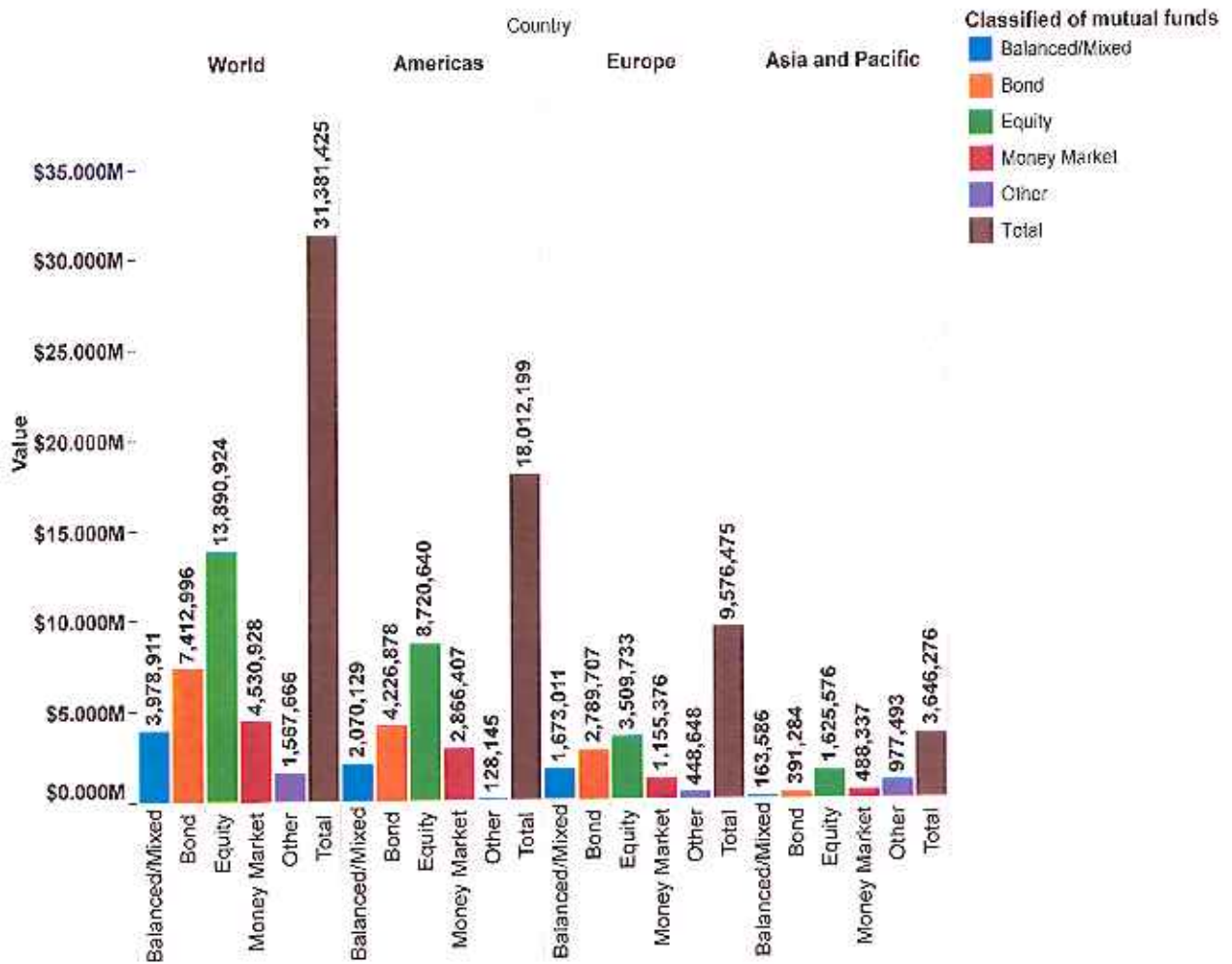
d) Sector Funds

As the name suggests, sector funds are concentrate on a specific industry. For instance, biotechnology, precious metals or telecommunications sectors can only be an investment strategy.

e) Balanced Funds

Balanced funds are typically holds both equities and fix-income securities comparison to constant portfolios. An investor who wants to invest in a mixture assets, capital appreciation and modest income prefer to balance their funds (Zvi, Kane and Marcus J. 2011).

Figure 3: Total Net Assets in U.S. Dollars by Type of Funds 2014



Source: International Investment Funds Association

Total net assets of the classified of mutual funds is shown on the Figure (3). The importance of mutual funds industry and the desirability of its types and to what extent it has asset value in the worldwide is illustrated on the Figure (3). It shows that equity funds might be assumed as the most attractive mutual fund types which had higher assets relative to other types of funds. Americas region had the highest level of asset proportion comparison with Europe and Asia regions. In addition to this, Bond funds, Balanced funds and Money market funds asset value increased dramatically after Equity funds.

2.3 Advantages of Mutual Funds

a) Diversification

Diversification is one of the most important benefits of mutual funds which reduce the possible risk investing on a variety of instruments and broaden the investable area globally. Investors are able to obtain a wide range of ownership of adequate number of securities to decrease portfolio risk by investing in a fund.

The diversified portfolio is not only reducing the overall risk but also limiting the possible volatility movements in the value of assets included. Thus, to be able to have more consistent performance under the broad-based economic conditions, diversification seems preferable options.

b) Cost-effective

Investors are able to get information by skilled financial advisor with the help of investing mutual funds. However, if the investors directly and individually make arrangement with an advisor, the cost would be expected to be higher.

Additionally, the advisory fee is lower due to the wider size of assets managed in the mutual funds relative to investing individually or directly. Final key point is the transaction costs, custodian fees and recordkeeping costs are cheaper than directly investment because of fund size can reduce these costs down.

c) Liquidity

Mutual fund shares can be easily bought and redeemed any day at closing Net Asset Value. It enables easily get in and out from the funds. Therefore, it provides a large flexibility to the investor who wants to redeem from the funds liquidating themselves allocations.

2.4 The fund styles, kinds and main characteristics and holding in Turkey

2.4.1 Fund styles in Turkey

Borsa Istanbul; formerly named as Istanbul Stock Exchange (ISE), was established in 1985. After being found Istanbul Stock Exchange, the first mutual fund was generated in 1987. Having been successfully completed the regulatory structure; the mutual funds began to grow rapidly.

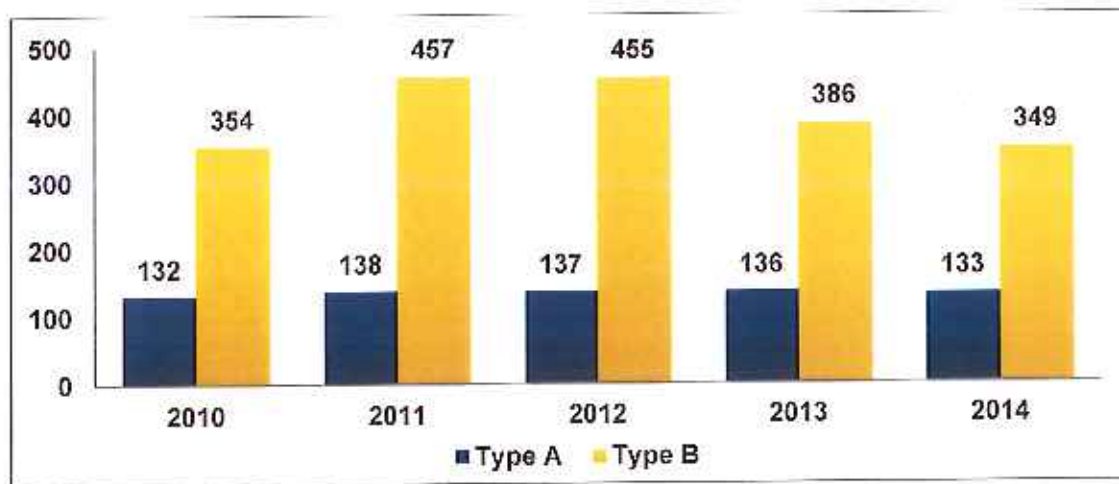
Mutual funds were separated into two different types considering their investment style. These funds are classified as Type A and Type B. The striking difference between these types is that Type A funds are compelled to invest at least %25 of their holdings into the Turkish stocks, whereas there is no such obligation in Type B mutual funds.

These two types of mutual are also sub-divided into different kind financial instruments which comprise the fund portfolio. These financial instruments are Notes and Bonds, Equity, Sector, Gold, Affiliate Companies, Precious Metals, Variables, Balanced/Mixed, Liquid, Foreign Securities, Index and Exchange Traded Funds, Capital Guaranteed, Hedge Funds, Private Funds, Fund of Funds and Capital Protected.

There were 483 mutual funds in Turkey as of 2014 - end. The number of capital protected mutual funds (68), variable (144), notes and bond funds (56) and liquid funds (43) are the most common kinds which %64.4 of mutual funds were generated by these four different kinds in 2014 (Capital Market of Board Turkey Bulletin April 2015).

As it can be seen on the Figure (4) the number of Type B mutual funds is almost threefold of Type A mutual funds between 2010 and 2014. This figure also demonstrates that the number of Type B not only have higher investors but also are more popular than Type A mutual fund.

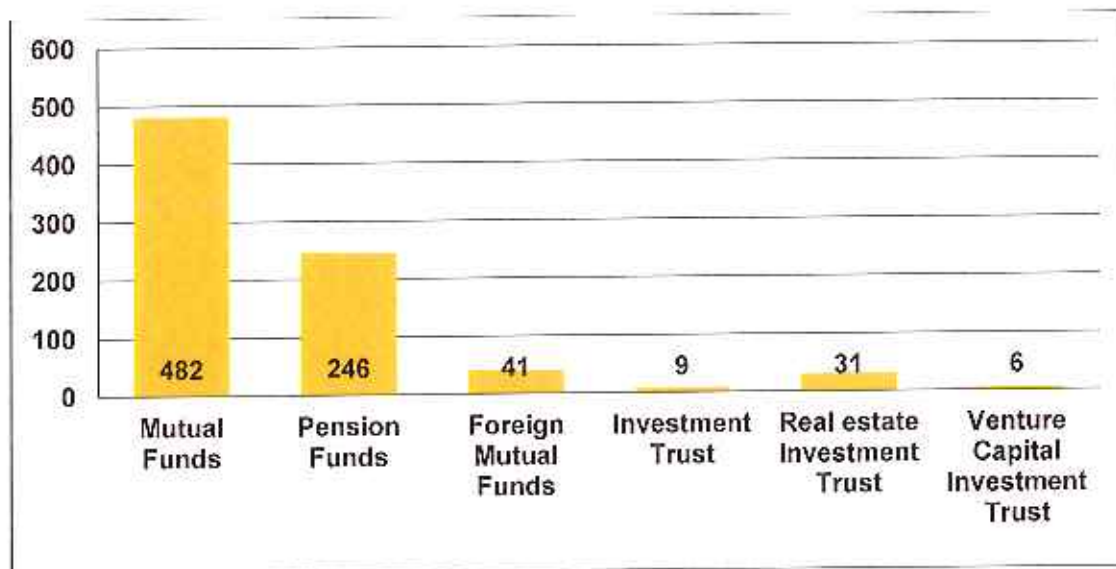
Figure 4: The amount of mutual funds in the period of 2010-2014 in Turkey



Source: Capital Market Board of Turkey Bulletin April 2015

The number of capital market institutions was 815 in Turkey 2014-end. Figure (5) shows to what extent type of market institutions are popular in Turkey. It can be stated that the highest proportion belongs to mutual funds (482). Secondly, pension funds (246) and then foreign mutual funds and real estate funds (41) and (31) respectively. Investment trusts and venture capital investment trust had the least proportion as capital market institutions (9) and (6) respectively. At that point, it is highly likely to clarify that mutual funds plays important factor in the Turkey fund industry and keeps the largest portion relative to other capital market institutions.

Figure 5: Capital Market Institutions as of 2014-end in Turkey



Source: Capital Market Board of Turkey Bulletin April 2015

2.4.2 The kind of mutual funds in Turkey

There are 12 different kinds of mutual funds in Turkey. The most important are aligned with,

Type A mutual funds:

It contain heavily stocks instruments therefore, risk is always high as well as high return.

Also, at least 25% of portfolio has to be invested in Turkish company stock.

a) Equity Funds; this fund mainly invests at least 51% in stocks. Therefore, it does intend to contain high risk and to be able to earn abnormal return to the both investors and fund.

b) Mixed funds or Balanced Funds are consisted of at least two different types of capital market instrument such as stocks, gold and other precious metals and these asset allocations must be minimum 20% of each of them.

c) **Variable funds** have not any restriction in terms of assets allocation. However, Stocks and Treasury Bills are the principle investment vehicles of this kind of funds.

d) **Sector funds** at least invest 51% of its fund in specific sector such as cement, textile or technology.

Type B mutual funds:

These types of funds invest in principally fix-income investment vehicles such as Treasury Bills, Government Bonds and repos. Risk is kept as much as minimum level thus, the return of fund is assumed lower than Type A mutual funds.

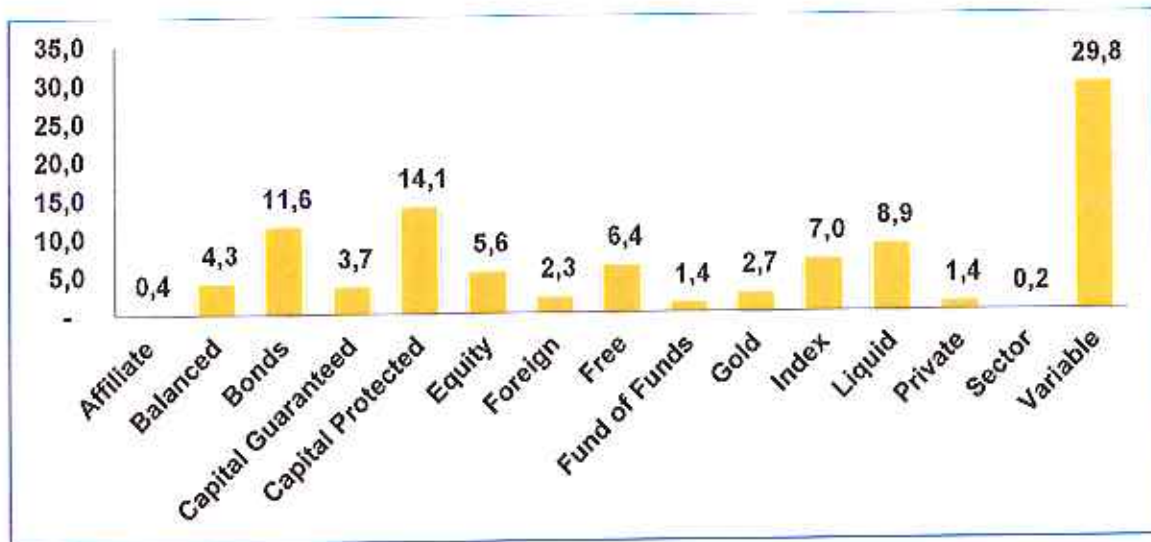
a) **Variable funds**; in addition to there is no constrain, typically it invests in both stocks as 25% and Treasury Bills 20%. It aims to contain and balance both Type A and Type B fund instruments.

b) **Liquid funds** are the fund can be easily liquidated in accordance with specific maturity dates such as 90 days. This facilitation strengthens the investor's potential investment options.

c) **Gold funds**; fund at least invests in 51% its assets gold related investment instruments. Primary benchmark also are considered specifically gold index.

d) **Bonds and Bills Funds**; minimum 51% of the portfolio are allocated to private or public debt instruments.

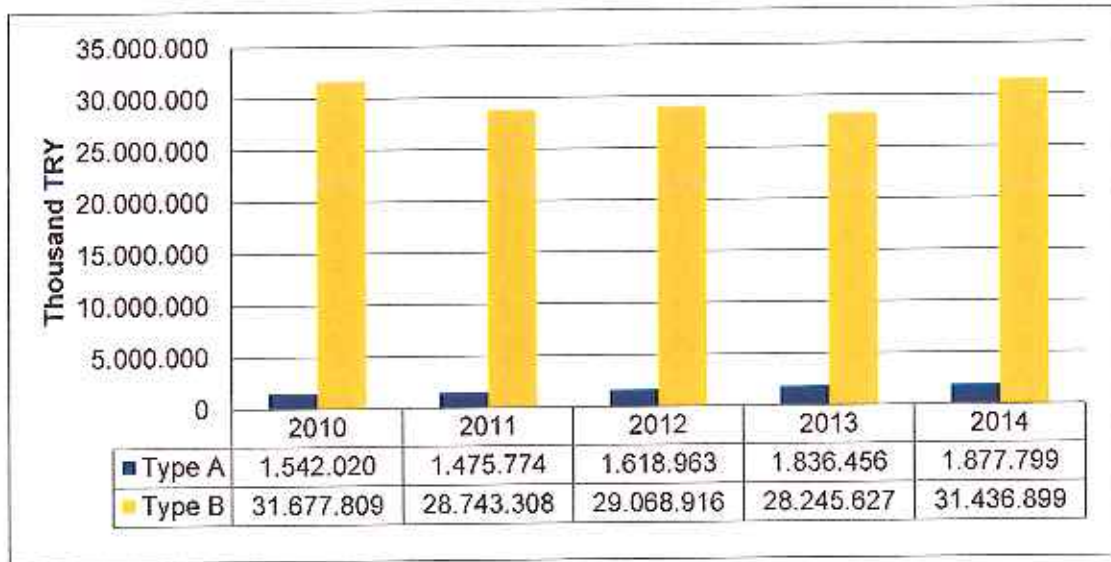
Figure 6: Percentage Distributions of Mutual Fund Kinds as of 2014-end in Turkey



Source: Capital Market Board of Turkey Bulletin April 2015

Type A and Type B mutual funds are sub-headed a variety of financial instruments. These are demonstrated on Figure (6). Variable fund, Capital Protected and Bond funds have the highest proportion compared to other kind of funds %29.8, %14.1 and %11.6, respectively whereas; Sector funds, Affiliate, Fund of Funds and Private Funds are the least proportion funds considering the other kinds. Sector funds could be considered as a risky due to mainly invest in only a particular of sector and also, fund of funds can be assumed as costly investment strategy comparison with other options. Thus, these types of are less attractive by the individual and institutional investors as of 2014-end in Turkey.

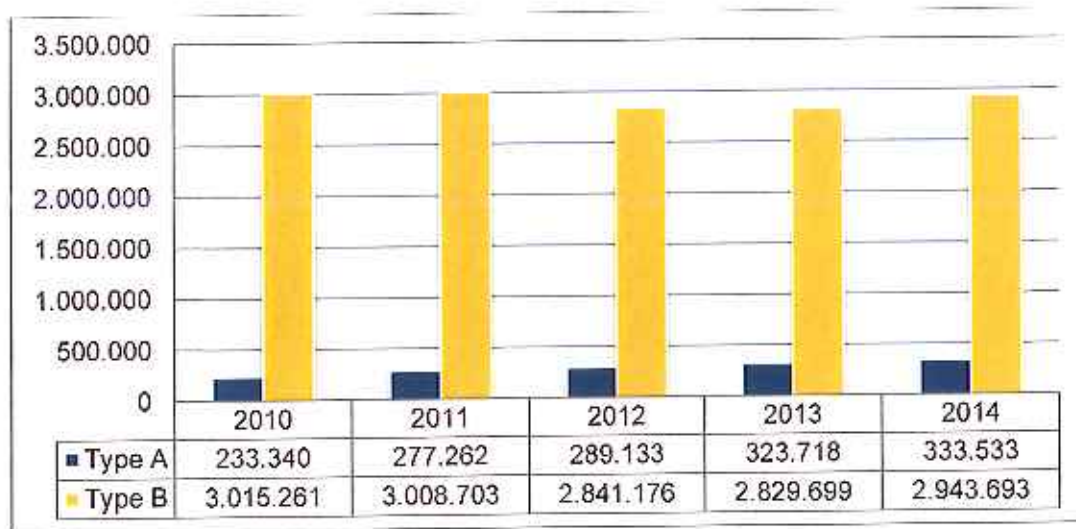
Figure 7: Net Assets Value of Mutual Funds between 2010 and 2014 in Turkey



Source: Capital Market Board of Turkey Bulletin April 2015

Figure (7) show that the net asset values of these two types of mutual funds separately over the last five years. It can be truly stated that there have been remarkable differences between these two types mutual funds' assets value. Type B funds appear more efficient, dominant and popular relative to Type A funds taking into account last five years period.

Figure 8: The Amount of Mutual Fund Investor 2010-2014 in Turkey



Source: Capital Market Board of Turkey Bulletin April 2015

In addition to striking net asset value difference between Type A and Type B funds, the number of investor of those two types of funds have also shown considerable differentiation in the same period of time on Figure (8). Type B mutual funds make impression as more attractive and popular relative to Type A mutual funds in terms of the number of demand from the investors. Over the last five years; although both mutual funds investor number remained stable, Type B mutual funds as much greater as ten times of Type A mutual funds. The reason why investor might predominantly prefer Type B fund is that instead of taking high risk they give priority to the less risky and fix-income instrument due to increasing instability in emergent market economic conditions.

2.4.3 Holdings Mutual funds in Turkey

Table 1: Total Portfolio Compositions of Type A Mutual Funds

YEARS	S %	GB %	RR %	MM %	FS %	OTHER %
2010	65.15	21.12	12.96	0.15	0.13	0.5
2011	64.07	16.66	15.97	0.66	0.1	2.54
2012	73.22	13.55	5.49	1.17	0.1	6.48
2013	71.22	11.14	10.28	1.29	0.1	5.97
2014	74.47	10.25	5.04	1.36	0.17	8.71

Source: Capital Market Board of Turkey Bulletin April 2015

S %: Proportion of Stock in the portfolio.
GB %: Public Debt Instruments in the portfolio.
MM %: Proportion of Money Markets in the Portfolio
RR %: Proportion of Reverse Repo in the Portfolio
FS %: Proportion of Foreign Securities in the Portfolio

The main differences of between Type A and Type B mutual funds is not only Type A funds are obliged to invest %25 of holdings in Turkish equities but also there is strategic discrepancies in terms of managing holdings of portfolios. The portfolio holdings of Type A mutual funds is shown on Table (1) as over the last five years period.

Fundamentally, the proportion of holding stocks was much higher than other instruments and it varied between 65.1 per cent and 74.4 per cent from 2010 to 2014. This detail gives information to the investor to what extend Type A mutual funds risky and at the same time it does aim to provide higher return to the investors.

Type A mutual fund may be effected easily by the positive and negative price fluctuations in the index, due to the being hold intensively stocks. Thus, risk and return expectations are higher compared to Type B mutual funds (Turkish Institutional Investment Managers' Association).

On the other hand, Type B mutual funds portfolio compositions Table (2) might be assumed much more risk averse relative to Type A funds and therefore, it aims to reduce the potential risk diversifying its portfolios to the across the other instruments. The Type B funds are mainly invests in debt, reverse repo and fix-income instruments. The purpose is to obtain a profitable interest return from the investments. Additionally, holding variety types of investment vehicles have started to become more popular based on the Table (2) for the last five years.

Table 2: Total Portfolio Compositions of Type B Mutual Funds

YEARS	S %	GB %	RR %	MM %	FS %	OTHER %
2010	0.73	28.77	55.91	8.30	0.40	5.88
2011	0.51	23.72	48.25	9.58	0.39	17.56
2012	1.09	20.34	39.78	8.01	0.48	30.30
2013	1.25	17.34	30.38	11.89	0.72	38.41
2014	1.64	11.31	20.49	12.72	1.41	52.43

Source: Capital Market Board of Turkey Bulletin April 2015

CHAPTER 3

LITERATURE REVIEW

3.1 Evaluation of portfolio performance

"Performance evaluation is a critical and often poorly handled aspect of the portfolio management process. The principle problem with performance evaluation is the human tendency to focus on the return a portfolio earned over a period of time with little regard to the risk taken in achieving that return. Proper performance evaluation should involve recognition of both the return and riskiness of the investment." Strong (2009, p513)

This chapter aims to provide an overview of the traditional risk adjusted measures of portfolio performance. First a brief history is given in the background of performance evaluations and secondly, a summary of the some performance methods which have been developed and introduced. Finally, previous studies which have been done taking account of performance evaluation tools are reviewed in the second part of the Chapter 4.

Portfolio evaluation has changed dramatically since 1960s. Since the acceptance of modern portfolio theory, the evaluation process has reshaped and evolved from complex return calculation to detailed estimation of risk and return for the each source. In addition to this, shifting from not being a complementary part of organizations to the being an integral part of organizations due to the external pressures, most investment organization incorporated their performance evaluation to enhance critical decision making process for the last two decades.

Measuring return has been used as an evaluation technique whereas, the fact that there are many inflows and outflows of funds to the portfolio and a different amount of money

are invested at different time period was supposed cause problems to evaluate a portfolio performance.

Modern portfolio theory was devised by Markowitz in 1952. It separates the risk of each security into two sections as systematic risk and unsystematic risk. The separation between systematic and unsystematic is the establishment of Capital Asset Pricing Model (CAPM) which devised by Sharpe (1964) and Lintner (1965).

CAPM suggests that investor should prefer to invest in a extensively diversified "market portfolio" which incorporated with secure assets or cash depending on the investor's risk expectation.

In 1968, Jensen introduced a measure which widely used to determine whether a portfolio is providing regular return for its level of risk. It represents the average return on a portfolio, given the portfolio's beta and the ordinary market return.

Jack Treynor and Fischer Black introduced information ratio as an alternative way to measure performance of funds in 1973. Benchmark return is considered instead of taking into account risk-free rate for calculation.

Data Envelopment Analysis (DEA) method was developed by Charnes, Cooper and Rhodes in 1978 to eliminate the potential limitation of Jensen's alpha and Sharpe Ratio. DEA advantages are described as avoids benchmark issues which exist in using Jensen Index (Murthi, Choi and Desai 1997).

After Treynor and Mazuy devised the first market timing ability measure, it was developed as formal models in the 1980s. The aim of the measuring timing ability of manager's is to

understand to what extent or whether portfolio managers generate absolute return compare stock market value return.

Grinblatt and Titman (1993) attempted to introduce a new measure for portfolio performance of a large sample of mutual funds. Instead of using traditional risk-adjusted performance measures, portfolio holdings were employed and the measure did not require the use of a benchmark portfolio. The study showed that aggressively managed growth fund managers provided abnormal return in the period of 1976-1985.

The arbitrage theory of capital asset pricing was developed by Ross in 1976. The purpose of this model is to succeed the superior return with minimum risk and to generate a different model to the mean variance capital asset pricing model, which introduced by Sharpe, Lintner and Treynor which identifying risky assets in capital markets.

Fama and French (1993) developed a Three Factor Model as an expansion of capital asset pricing by supplementing size and value determinants as well as market risk factors in capital asset pricing model.

After development in arbitrage pricing theory models, there have been remarkable improvements on performance evaluation methods. Multiple-Benchmark and Multiple-Index models have been commonly used to measure performance of managed portfolios for the last decades.

Single-Index approach has been taken into account in many previous researches for performance comparison of funds. However, differentiation between holdings of funds in terms of type of assets have considered an important prevention to conduct sound study and therefore, multiple-benchmark approach have been supposed to improve on the fund's performance evaluation by being used appropriate benchmarks for each fund.

Despite the fact that it is widely accepted in many individual investors, few weaknesses has been determined such as not enable to deem of how tightly the fund convenient for the each benchmark. To improve the single-benchmark models efficiency multiple-index approach has been applied to control for multiple asset categories.

Simon (1998) discussed a new method to evaluate risk-adjusted performance of funds which is called Modigliani measure. It was developed by Franco Modigliani and Leah Modigliani in 1997. The fact that the interpretation of Sharpe Ratio is assume difficult by investor cause to being developed a new measure to be able to do an understandable evaluation. The Modigliani measure represents a fund's performance relative to the market in percentage terms. It is believed that easier to interpreted and understand compare to other ratios due to being reports the risk-adjusted performance of a mutual funds as a percentage.

The evaluation of mutual funds performances has become more popular due to the external factors and being highly competitive investment management industry for the last a few decades. Mostly, studies focused on actively managed funds with passive index in terms of whether active funds add value or not, manager's timing ability was another popular study area to understand if the managers have skills or they are lucky to outperforming the market index and also associated those studies whether past performance is an indicator for future performance has been arguable point in mutual funds' performance studies.

Cremers and Petajisto (2009) attempted to measure the performance of active funds in the period of 1980-2003. Introducing a new measure as Active Share and tracking error, study demonstrated that there was superior outperformance and persistency compared with benchmarks including before and after expenses.

On the other hand, Berk and Green (2002) developed a model to observe relationship between active portfolio management and its return and fund flow deeming benchmark index.

They claim that active managers do not outperform passive index due to competitive market for capital response as well as reducing returns to measure in active portfolio management. Therefore, it was asserted that past performance is not an indicator to predict for future performance of funds.

In addition to the importance of actively and passive managed funds performance finding, market timing abilities of portfolio managers has also carry significance due to the closely associated with our study. The striking difference of Type A and Type B mutual funds is based on their strategy approach. Type A is a fund which aims to outperform the benchmark indices to provide a superior return to its investors and fund whereas, Type B does mainly invest in low-risk investment vehicles and aims to provide fix-income return to the fund and its investors.

Kon (1983) conducted a research to measure market-timing performance of an investment manager in a model of mutual funds. He asserts that significant timing ability and performance was found based on his research. Chang and Lewellen (1984) found little evidence on market timing ability of managers and mostly were not able to perform better than passive benchmark index.

3.2 Empirical studies related to performance evaluation methods

Jensen (1968) devised a formula to measure and to determine a portfolio manager's predictive ability which shows to what extend a manager's have skills or able to predict successfully security price. He employed 115 mutual funds on his research between 1955 and 1964. The findings of study indicate that average of these mutual funds could not predict the security price to beat the market index and also there was little evidence on the

ability of performing better than which he assumed from random chance in all individual mutual fund.

There have been conducted too much studies regarding measuring the performance of mutual funds since 1960s. Mc Donald (1974) aimed to evaluate and measure risk return and objectives of 123 American mutual funds between 1960 and 1969. In two-thirds of the mutual funds Sharpe Ratio was less than the market's value. Treynor's return to beta 67 of 123 mutual funds exceeded the market ratio and approximately one-half of the funds Jensen's alpha generated positive return. Mc Donald concluded any of mutual funds notably outperformed or underperformed between 1960 and 1969.

Jayadev (1996) undertook a research to evaluate the performance of two growth aimed mutual funds (Mastergain and Magnum Express) employing the risk-adjusted measurement methods. According to findings, Mastergain performed better considering Jensen's Alpha and Treynor measure whereas, Sharpe Ratio was less than the benchmark index. Magnum Express performance was little weak on the ground of all three measures.

Jenke, Nijman and Roon (1998) implemented a research to analyse style and performance evaluation of Dutch mutual funds from 1993 to 1997. Jensen measure was utilized to evaluate the performance of the mutual funds. The results of study demonstrated that the mutual funds which principally invest in "Netherland Equity" performed better than the interiorizing passive portfolio approach mutual funds.

Blake and Timmermann (1998) undertook a study to measure performance of mutual funds in the UK. In this research, they employed Jensen regression method and collected 2300 UK open-ended mutual funds data the period between 1972 and 1995. It was found out that average UK equity fund underperformed as much as 1.8 per cent per year on a risk-adjusted ground.

Sipra (2006) evaluated and measured the performance of 33 mutual funds in Pakistan using Sharpe, Jensen and Treynor measures between 1995 and 2004. According to Sharpe findings, apart from only a mutual fund which outperformed the benchmark during last five years, none of them could beat the market portfolio over the ten years period. Treynor and Jensen results also demonstrated that the overall performance of mutual funds was inferior compared with the market index. The results also strength semi-strong market efficiency theory to what extend is valid on the developing markets.

Nafess, Shah and Khan (2011) conducted a study to gauge risk adjusted performance of close and open-ended mutual funds from 2006 to 2010 in Pakistan. In order to enable the investors how performance analysis can be condemned during investment decision making, risk adjustment performance measurements were taken into account such as Sharpe, Jensen, Treynor and Information ratio. The results unveiled that not only being collected data's Sharpe and Sortino measure were negative but also Treynor and Information Ratio results far away from the market return.

There have been done so many researches to analyse performance of mutual funds and understanding portfolio manager's stock picking and market timing ability for a long years. Although a few studies indicated mutual funds provided a good return, some of mutual funds underperformed and showed inconsistency comparison with market return.

Gursoy and Erzurumlu (2001) who attempted to evaluate the portfolio performance of mutual funds in the period 1998-2000 in Turkey. 55 Type A and 77 Type B mutual funds' performance compared with the Treasury Bill rate and ISE-100 index return utilizing Sharpe, Jensen, Treynor and Graham & Harvey measures as well as Spearman rank correlation analysis employed to test four ratios make similar ranking. The study revealed that Treasury Bills was the best investment vehicle which provided health and better return; respectively this followed by ISE-100 Index, Type B mutual funds and Type A mutual funds. It was also

brought a new dimension the discussion of outperforming the market by fund managers is arguable point.

Yalcin (2012) attempted to measure the performance of thirty three Type A open-ended mutual funds for the period of 2003 and 2010 in Turkey. CAPM and Fama-French's Three Factor Model were employed in this study. The key finding of this research almost all Jensen's Alpha was found out as zero and results indicated none of Type A mutual funds outperformed or underperformed during the seven years period. Therefore, she concluded that fund manager have not enough ability to choose right investment vehicle and lack of timing the market between 2003 and 2010.

Samirkas and Duzakin (2012) similarly conducted a research to analyse performance of Type A and Type B mutual funds in the period of 2000-2010 utilizing performance evaluation ratios Sharpe, Treynor, and Jensen measures. The results of this study disclosure that Type A mutual funds demonstrated consistently successful performance in consecutive years whereas, Type B mutual funds were able to perform better only in 2001 and 2009 years. The results unveiled that Type A mutual funds are seen superior investment vehicle compared with Type B mutual funds.

Gokgoz and Gunel (2012) undertook to evaluate performance of Turkish mutual funds considering single-criteria models (Sharpe, Treynor and Jensen measures) and utilizing ten mutual funds on each type of funds (Type A, Type B and Variable mutual fund) in the 2000-2009 period. Notably, the finding of their research unveiled that apart from few exceptions Sharpe and Sortino Ratio results demonstrated a similar pattern. Accordingly; Treynor and Jensen measures were also generated akin results.

Parlak (2014) conducted a research to diminish the controversy between pension funds and mutual funds' performance and also to expose whether active managed funds or passively managed funds provide a health return compared to market indices. 53 funds were

employed and Sharpe, Treynor, Fama, Sortino and Jensen's measures were applied in the period 2007-2012 in Turkey. The striking finding was revealed that there was only a fund among the 53 funds which provided superior return to the investor and this was indicated chance factors are highly likely to demonstrate a better performance rather than having ability of manager's.

CHAPTER 4

DATA AND METHODOLOGY

4.1 Data and Research methodology

Research Data

It is attempted to measure performance of Type A and Type B mutual funds and explore if there is a feasible finding or not. The time period is determined as starting from beginning of January 2010 until at the end of the December 2014; the length of time period is reckoned as 59 months.

In order to obtain sufficient and decent data, a wide range of source has been applied. Type A and Type B mutual funds have been selected rationally and detailed to prevent potential mistake for performance evaluation such as survivorship bias.

The fact that some of funds are being closed due to poorly performance or some fund prefer merged into the other funds to increase performance efficiency in the fund can lead to miscalculation during the performance evaluation period. This is called survivorship bias and therefore mutual funds are cautiously determined from the Capital Markets Board of Turkey database. Capital Markets Board of Turkey is an institution which implements regulations associated with market organisation, develops market instruments and institutions since 1981 in Turkey.

As an alternative way of calculating separately performance evaluation ratios, instead of finding monthly returns of funds and determining risk free rate and implementing data on Excel, The Bloomberg Professional service (the Terminal) is the software to obtain financial data is employed as a principal source of to measure risk-adjusted performance of mutual funds over the five years period.

In order to do efficient evaluation; rather than determining specific benchmark indices, benchmarks are allocated separately for each on Type B fund due to differences of each mutual fund kinds. For Type A mutual funds the principal benchmarks are taken into account BIST 100 index, BIST 30 index and 365 days. BIST-100 is consisted of the 100 largest companies listed on the National Market. On the other hand, the benchmark indices for Type B mutual funds are mainly consisted of KYD-GDS 365 index, KYD-GDS 91 index KYD-GDS-All index.

KYD-GDS indices were created the ISE Bonds and Bills transacted in market operation to reflect discounted and fixed rate coupon state of the return on bonds as a whole and therefore, were generated specifically for institutional investors and also all fix income securities investors to provide a gauge in case they can compare their performance targets. In order to provide criteria to invest different maturity structure, KYD-GDS divided into five different indexes such as KYD-GDS-30 and KYD-GDS-91 so on.

In order to examine performance of mutual funds, 10 Type A and 10 Type B open-ended mutual funds are selected from the Capital Market Board of Turkey database and Bloomberg Professional is employed to find out the risk-adjusted performance results of mutual funds.

Table 3: Selected Type A mutual funds for performance evaluation

TYPE A MUTUAL FUNDS
1-ALTERNATIF BANK TYPE A EQUITY FUND
2-ATA TURKISH EQUITY GROWTH FUND
3-DENIZBANK TYPE A VARIABLE FUND
4-FINANSBANK EQUITY FUND
5-GARANTI BANK TYPE A EQUITY FUND
6-HALKBANK TYPE A COMPOSIT FUND
7-OYAK SECURITIES TYPE A VARIABLE INTENSIVE EQUITY FUND
8-TEB TYPE A ALARKO PRIVATE FUND
9-TEKSTILBANK TYPE A EQUITY FUND
10-VAKIFBANK TYPE A VARIABLE FUND

Source: Capital Market Board of Turkey

Table 3 and Table 4 show determined funds selecting from Capital Market Board of Turkey database. These funds separated into the specific criteria as different type. Commonly, banks are subject to operate of mutual funds in Turkey. Therefore, many of mutual funds are being managed by banks and financial institutions.

Table 4: Selected Type B mutual funds for performance evaluation

TYPE B MUTUAL FUNDS
1-ALTERNATIF BANK TYPE B VARIABLE FUND
2-ATA FOREIGN SECURITIES BALANCED FUND
3-DENIZBANK TYPE B VARIABLE ACCUMULATION
4-FINANSBANK LONG-TERM VARIABLE FIX INCOME FUND
5-GARANTI BANK TYPE B OTTOMAN GOLD FUND
6-HALKBANK TYPE B SHORT-TERM BILL AND BONDS FUND
7-OYAK SECURITIES TYPE B LIQUID
8-TEB TYPE B VARIABLE FUND
9-TEKSTILBANK TYPE B VARIABLE FUND
10-VAKIF BANK TYPE B LIQUID POOL FUND

Source: Capital Market Board of Turkey

4.2 Risk-adjusted portfolio performance measures

4.2.1 Sharpe ratio

Sharpe Ratio is devised by William F. Sharpe in 1966 to evaluate the performance of mutual funds. It was designed as forward-looking ratio for establishing what reward an investor could anticipate for investing in a risky asset versus a risk-free asset.

Sharpe introduced the model of risk free asset. He generated capital market line as the efficient portfolio line screening risk free assets with the Markowitz modern portfolio theory. The model enabled to progress for further to use it for the specification of expected rate of return for a risky asset and also caused to the improvement of capital asset pricing model (CAPM).

Sharpe (1966) developed a new formula to measure risk-adjusted returns of portfolio in 1966. In this formula, standard deviation of portfolio was considered. Sharpe evaluated 34 mutual funds using Sharpe Ratio, Treynor Ratio and a third factor to determine which of mutual fund managers have better skills from 1954-1963.

$$\text{Sharpe Ratio} = \frac{R_p - R_f}{\sigma_p}$$

Where R_p is the annualised return of the portfolio, R_f is the annualised risk free rate and σ_p is the standard deviation of the portfolio returns.

The Sharpe Ratio is calculated by subtracting the risk free-rate from the expected portfolio return and dividing the results by the standard deviation of the portfolio returns. It empowers investors to understand if the returns are based on feasible investment or simply taking on additional risks (Pagdin 2015).

Sharpe Ratio = Risk Premium / Standard Deviation of Portfolio

Risk Premium = Total Portfolio Return – Risk-free Rate

The striking difference of Sharpe Ratio from the Treynor measure which another important performance evaluation ratio is that it is a measure which takes into account total risk of the portfolio by using standard deviation of returns whereas, Treynor Ratio considers systematic risk summarized by beta (Reilly and Brown 2012).

Sharpe Ratio is most widely known as risk-adjusted performance measure. Therefore, there have been many discussions on reliability of Sharpe Ratio. The most important advantages are defined straightforward to calculate and widely used in practice, linked conceptually to the capital market theory by Reilly and Brown (2012). Jobson and Korkie (1981) a wide range of statistical test are appropriate for Sharpe ratio and Plantinga and de Groot (2001) the significant advantages of considering the upside potential ratio instead of Sortino ratio and it is consistent for evaluating both profits and losses whereas, Treynor and other measures are not subject to these statistical tests.

However, several drawbacks are also highlighted regarding the complexity of Sharpe ratio. (Reilly and Brown 2009) argue that it ignores diversification of portfolio and enables only relative assessments of performance for different portfolios. In addition to this, interpretation and assessment statistical importance is rather arduous.

Furthermore, there has been discussion on Sharpe's Ratio adequateness to evaluate performance of a hedge fund in 1997. Although The Long-term Capital Management hedge funds Sharpe Ratio 4.35 after deduction fees, it failure and nearly was causing collapse of the world financial system in late 1997. The allegations bruised strengthen of Sharpe ratio's on hedge funds' performance evaluation.

On the other hand, (Eling 2008) asserts that Sharpe could be considered superior compare with other performance measure due to the fact that it is consistent with expected utility

maximization. Therefore, Sharpe Ratio is adequate for examining returns of both mutual funds and hedge funds.

4.1.2 Treynor Measure

Treynor and Mazuy (1965) introduced the first composite measure of portfolio performance which includes risk. The Treynor model takes into account systematic risk rather than considering total risk as Sharpe. Systematic risk is the risk which cannot be diversified away and associated with the market. In that way, the model uses Beta as a risk measure whereas, standard deviation is used by Sharpe. Investors expect high Treynor ratio due to the fact that they may claim more return at a specific level of systematic risk.

$$\text{Treynor Measure} = \frac{R_p - R_f}{\beta}$$

R_p = average fund return;

R_f = the average risk free return

β = Beta

Another indication of Treynor model is that it measures the fund or portfolio manager's timing ability on the basis of rate of return performance. (Shah, Syed and Nisar 2005). Treynor and Mazuy (1966) examined timing abilities of manager's on mutual funds. They found that 37 fund managers demonstrated superior timing ability. Therefore, it is also rather useful method which applied by many researchers to analyse the portfolio manager's ability in Turkey.

4.1.3 Jensen's Alpha

Jensen measure was introduced in 1968 and the theory originally based on Capital Asset Pricing Model (CAPM).

Jensen released his research paper formulating Alpha in 1967. Jensen supported Treynor and Sharpe which a portfolio return ought to be risk-adjusted to thoroughly evaluate a manager's skill. Having higher risk portfolio are supposed to be provide better return over time relatively less risky portfolio however, outperforming managers ought not to be awarded to have skills owing to the fact that they undertook more risk.

Jensen (1968) analysed 115 fund returns to measure predictability of managers on his research between 1945 and 1964. It was found that the average fund provided about 1.1 per cent returns less than the S&P 500. Namely, the average fund managers could not produce alpha and were not able to guess the security price.

Although Alpha is a measure of manager's possible skills, it is unlikely to quota of manager skill. Alpha does not separate skill from luck. A large number of managers outperform the benchmark with the help of luck or randomness (Ferri 2011).

Formula;

$$\alpha = (r - r_f) - (\beta \times (r_m - r_f))$$

$$\text{Jensen's } \alpha = \text{Portfolio Return} - [\text{Risk-free return} + (\text{Market Return} - \text{Risk-free Return}) * \text{Beta}]$$

α = Alpha

r_f = Risk free rate

β = Beta

r_m = The (forecast) market rate of return

The interpretation of Jensen measure is that if the Alpha of the portfolio (α) is positive, this means the portfolio manager have a good stock-picking ability than that average manager and consistently provide better return than those predicted by Beta.

4.1.4 Sortino Ratio

Sortino measure was devised by Frank Sortino in 1994. The formula was reshaped and formed in a new way considering Sharpe Ratio. The striking difference from the Sharpe Ratio is that Sortino takes into account down side risk to calculate of the ratio which investors care about however, Sharpe ratio does not distinguish between upside and downside volatility. In order to calculate in an explicit way of Sortino Ratio, down side risk which replaced instead of Standard deviation is divided by excess returns of portfolio.

Formula:

$$\frac{R - T}{DV}$$

Where;

R = average portfolio return

T = average minimum acceptable return

DV = downside-volatility

As a modification of Sharpe ratio, Sortino ratio is assumed a better choice relative to Sharpe ratio, specifically when measuring and comparing the performance of managers whose plans to display positive skew in their return distributions. Also, Sortino ratio is better when analysing high volatile portfolios. The final significance of Sortino ratio is that it does not

penalize a fund manager for volatility rather than, it focused if returns are negative or below at a certain level.

CHAPTER 5

DATA ANALYSIS

5.1 Findings and Interpretation

Sharpe Ratio

The key feature of Sharpe Ratio from the other risk-adjusted measures is that it does give us clue if the return of portfolio owing to the skills of management or because of taking excessive risk. Thus, higher than 1 explain us to the extent that smartness in decision and represents better risk-adjustment performance of funds whereas, the negative Sharpe Ratio implies risk-free assets perform better than the performance of instruments determined for the investment.

Sharpe Ratio as one of the risk-adjusted performance evaluation methods results indicated that a majority of Type A mutual funds either did take much more risk than Type B mutual funds or it had much more skilled managers compared to Type B mutual fund's managers respectively; Alternatif Bank Type A Equity fund 2.13, Halk Bank Type A Composite fund 1.87 and Finans Bank Equity fund 1.56 in 2010. On the other hand, in general Type B mutual funds demonstrated negative results and the highest negative was reached by Oyak Securities Type B liquid fund as -48.3 and Vakif Bank Type B liquid fund at -41.76 in 2010.

Neither Type A mutual funds nor Type B mutual funds could generated a high risk-return results except for Garanti Bank Type B Ottoman Gold fund by 1.25 in 2011. The furthest results from the 0 was as Type A, Vakif Bank and Oyak Securities funds respectively -1.39 and -1.26 whereas, this ratio for Type B funds was reached by Vakif Bank Liquid fund less than - 19.

However, there was a striking increase in Type A mutual funds Sharpe ratio compared to Type B mutual funds in 2012. Whole Type A mutual funds provided better return considering risk has been taken. Ata Turkish Equity and Garanti Bank Equity fund demonstrated highest ratio respectively 4.28 and 3.86. However, Finans Bank long-term variable fix income produced 2.85 Sharpe Ratio as a highest Type B mutual fund.

In 2013, none of mutual funds had results higher than 0. Ata Turkish Equity had -0.59 which was the best Sharpe among the Type A mutual funds. On the other hand, the highest Sharpe ratio was -0.68 by the Ata Foreign Securities Balanced Fund within Type B mutual funds.

Type A mutual funds achieved a higher Sharpe ratio compared with Type B mutual funds providing in much more positive and higher return relative the amount of investment risk it has taken in 2014. Ata Turkish Equity Growth Fund had superior Sharpe ratio at 2.07 amongst both Type A and Type B. Yet, Halk Bank Type B Short-term Bond and Bill Fund had the lowest Sharpe ratio within these funds.

The high and low Sharpe results were obtained by Type A and Type B fund in the five years period. The fluctuation or inconsistency on the results across the five year might be associated with volatility of standard deviation and high and low level of excess return. Due

to Type A funds holds high volatile stocks may also be considered one of the factors which effects the Sharpe ratio level.

Jensen Alpha

Jensen Alpha is one of the risk-adjusted performance measure ratios which assist to determine the proper level of return relative to risk has been taken. What can be interpreted is that the higher Jensen's alpha means a fund manager outperform the market indices with the help of his or her stock selecting abilities.

On the basis of above explanation, the results proved that Alternatif Bank Type A Equity fund had the highest level of alpha (21.24) among the all other funds nevertheless, only Finans Bank Long-term Variable fix-income fund were able produce 4.88 alpha as the highest of Type B mutual fund in 2010.

Conversely; apart from Ata Foreign Securities Balanced Fund's superior Jensen's alpha which 45.26 was, none of manager could present positive alpha and as a result, many of alpha remained under the zero (0) in 2011.

2012 was the only year all of Type A mutual funds Jensen's Alpha higher than zero (0). This results demonstrates that Type A funds provided excellent return relative to risk has taken and therefore, it can be interpreted that fund managers beat the market indices in that year. Particularly, Ata Turkish Equity fund generated 32.07 alphas as a highest Type A fund whereas, Deniz Bank Variable Accumulation Fund produced 204.53 alpha within Type B funds.

Furthermore, Ata Turkish Equity Growth Fund was the only fund produced the highest level of alpha (1.93) comparison with other Type A mutual funds which mostly provided negative alpha in 2013 however; Finans Bank Long-term Variable Fix-Income Fund beat the market as much as 1.29 in the same year.

As well as 2013 alpha results, 2014 was a successful year for Ata Turkish Equity Growth Fund due to having positive alpha as much as 1.93 relative to other funds which having provided negative returns to the funds. Although five of Type B mutual fund's Jensen Alpha was not identified, the rest of the funds presented both negative and positive return relative to the risk has been taken.

The results of Sharpe ratio show similarity with that Jensen's alpha in terms of providing superior and inferior returns to the funds and investors. The reason of the fluctuation and inconsistency on Jensen's alpha results can be interpreted that portfolio managers have not had enough ability to predict the market price of securities over the long-term period and therefore, the portfolio managers generated high Jensen's alpha is assumed as lucky. This conclusion is also connected with efficient market hypothesis. The reason is that it is unlikely to outperform the overall market through expert level of stock selection or market timing according to efficient market hypothesis.

Treynor Measure

As it is known, the striking difference between Sharpe Ratio and Treynor measure both of them take into account different denominator while calculating of risk-adjusted measures of portfolio. Whilst Sharpe ratio considers the standard deviation which measure of the total volatility both upside and downside, Treynor measures takes account of Beta which measures only the portfolio's sentimentality to the market movements. Hence, high Treynor measure more than "1" implies that the funds are being administrated through aggressive

strategy against market risk whereas, Treynor measures lower than "1" indicates that the managers' strategy towards the market risk is defensive.

Based on above explication, the findings demonstrated that merely Alternatif Bank Equity Fund met higher Treynor measure as 1.09 whilst, the rest of the Type A mutual funds generated lower than "1" in 2010. Therefore, it can be stated only Alternatif Bank Equity Fund had better risk-adjusted return compared with other funds. In addition to this observation, despite the fact that eight of Type B fund's Treynor measure were not defined, the rest of them was provided positive and negative Beta in 2010.

However, not only entire Type A mutual funds but also majority of Type B mutual funds produced negative Beta in 2011. Both of mutual fund's Treynor results differentiated between -0.17 and -0.45 which fund managers stayed defensive towards the market movements in that period.

In 2012, Ata Turkish Equity Growth Fund had the highest Treynor measures as 1.13 among the other Type A mutual funds also, the results indicated few of fund Beta's were less than 1 yet, this number mostly were close to 1 such as Alternatif Bank Type A Equity 0.86 and Finans Bank Equity Fund 0.82. Conversely, Deniz Bank Type B Variable Accumulated Funds had the lowest Beta as much as -200.33 compared with similar type of funds in the same year. As a final point, Treynor measure results of Type A mutual funds not only were generated less than 1 in 2013 but also 2014.

Being a developing country which is an indicator of having weak economy, political instability, inconsistency on main market instruments and main index due to the fragile structure of the principal own currency have been key factors which need to be considered before taking an approach. Overall Treynor measure showed both negative and positive finding on a yearly basis. Thus, portfolio manager's strategies have changed on each year against the market

movements and taking aggressive and defensive approaches have showed differentiation due to ambiguous market movements.

Sortino Ratio

The notable difference between Sortino Ratio and Sharpe Ratio is that Sortino Ratio does take into account of downside risk or negative volatility of portfolio however; Sharpe considers total volatility of portfolio calculating the risk-adjusted return. Furthermore, higher Sortino Ratio is demonstrates that it is highly unlikely to have a large loss in the portfolio.

Based on above explanation, all of Type A mutual fund's Sortino Ratio demonstrated a superior performance in 2012 compared to other years. Furthermore, the overall Sortino Ratio varied between 0.99 and 2.74 in 2012.

As a fund which has a highest Sortino Ratio 2.74 was Teb Type A Alarko Private over the five years period. The second fund Halk Bank Type A composite Fund 2.42 and the third fund was Ata Turkish Equity Fund 1.87. Having stronger Sortino Ratios relative to the other funds identifies that there is low probability of a large loss on these funds comparison with other funds.

As for Type B mutual fund's Sortino Ratio, the overall ratio fluctuated between 0.59 and 8.12 which its distribution wider than Type A mutual funds from 2010 to 2014. The fund has 8.12 Sortino Ratio was Teb Type B Variable Fund and followed by Halk Bank Type B Short-term Bills and Bonds Fund 5.05 and Tekstil Bank Type B Variable Fund 4.56. The fact that these funds have superior Sortino Ratio means there is less chance to have a large detriment in the portfolio.

On the other hand, the lowest Sortino Ratio varied between 0.44 and 0.94 over the five years period. The fund has the lowest Sortino Ratio is Tekstil Bank Type B Variable Fund 0.44. The rest of lowest funds followed by Ata Foreign Securities Balanced Fund at 0.67 due to foreign securities funds have always supposed riskier investment instrument in Type B mutual funds.

Overall, the findings of Sortino Ratio revealed that Type B mutual funds had superior Sortino compared to that Type A mutual funds over the five years period. The fact that Type B mutual funds are usually consisted of fix-income securities, Government Bonds, Treasury Bills and Repo markets instrument in order to ensure continuities and returns might shows that why Type B mutual have higher Sortino compared to Type A mutual funds which mainly invest in stocks.

In addition to this, the fact that Sortino ratio considers downside risk which is rather important for investors to be informed regarding downside risk of the fund has been one the key factors of being utilised in this study. The downside risk of Type A funds were higher than Type B funds due to having different strategy and different kind of funds. Therefore, considering downside risk of the funds or Sortino ratios of funds, Type B funds would be more appropriate decision to take risk-averse action.

Table 5: Risk-adjusted performance results of Type A mutual funds

TYPE A MUTUAL FUNDS				2010	2011	2012	2013	2014
vs BENCHMARK								
1-ALTERNATIF BANK TYPE A EQUITY FUND								
			Jensen alpha	21.24	0.61	8.74	-	-
			Sharpe ratio	2.13	-0.71	2.41	-	-
			Sortino ratio	0.67	0.59	0.99	-	-
			Treynor Measure	1.09	-0.25	0.86	-	-
2-ATA TURKISH EQUITY GROWTH FUND								
			Jensen alpha	-	-0.32	32.07	1.93	13.44
			Sharpe ratio	-	-0.78	4.28	-0.59	2.07
			Sortino ratio	-	0.61	1.87	0.69	1.36
			Treynor Measure	-	-0.27	1.13	-0.18	0.44
3-DENIZBANK TYPE A VARIABLE FUND								
			Jensen alpha	-1.92	-6.98	7.3	-4.03	-5.95
			Sharpe ratio	0.69	-0.87	2.8	-0.84	0.69
			Sortino ratio	1	1.04	1.83	0.71	1.21
			Treynor Measure	0.19	-0.19	0.65	-0.27	0.15
4-FINANSBANK EQUITY FUND								
			Jensen alpha	15.25	-6.15	18.87	0.64	7.73
			Sharpe ratio	1.56	-1.05	3.51	-0.65	1.74
			Sortino ratio	1.32	0.85	1.68	0.93	1.29
			Treynor Measure	0.49	-0.34	0.82	-0.19	0.37
5-GARANTI BANK TYPE A EQUITY FUND								
			Jensen alpha	-3.49	-8.05	22.32	-1.88	-0.22
			Sharpe ratio	0.37	-1.1	3.86	-0.76	1.36
			Sortino ratio	0.97	0.69	1.76	0.96	1.23
			Treynor Measure	0.13	-0.38	1.01	-0.24	0.31
6-HALKBANK TYPE A COMPOSIT FUND								
			Jensen alpha	14.58	-9.74	21.34	-4.41	6.87
			Sharpe ratio	1.87	-0.79	3.55	-0.76	0.97
			Sortino ratio	0.89	0.61	2.42	0.6	1.26
			Treynor Measure	0.14	-0.17	0.21	-0.04	0.04
7-OYAK SECURITIES TYPE A VARIABLE INTENSIVE EQUITY FUND								
			Jensen alpha	12.09	-7.33	5.18	-4.39	-
			Sharpe ratio	1.78	-1.26	2.35	-0.85	-
			Sortino ratio	1.12	0.72	1.41	0.64	-
			Treynor Measure	0.61	-0.39	0.65	-0.26	-
8-TEB TYPE A ALARKO PRIVATE FUND								
			Jensen alpha	4.06	-8.78	12.04	-6.5	6.14
			Sharpe ratio	0.92	-1.24	3.44	-0.83	0.97
			Sortino ratio	1.28	0.61	2.74	0.69	1.28
			Treynor Measure	0.05	-0.1	0.13	-0.03	0.02
9-TEKSTILBANK TYPE A EQUITY FUND								
			Jensen alpha	16.12	-1.09	4.72	-19.54	-
			Sharpe ratio	1.49	-0.84	2.2	-1.38	-
			Sortino ratio	1.26	0.56	1.81	0.81	-
			Treynor Measure	0.89	-0.28	0.62	-0.63	-
10-VAKIFBANK TYPE A VARIABLE FUND								
			Jensen alpha	9.27	-9.92	4.7	-6.75	0.81
			Sharpe ratio	1.48	-1.39	2.37	-0.96	0.69
			Sortino ratio	1.05	0.49	1.44	0.49	1.65
			Treynor Measure	0.52	-0.45	0.66	-0.33	0.32

Source: Bloomberg Professional

Table 6: Risk-adjusted performance results of Type B mutual funds

TYPE B MUTUAL FUNDS				2010	2011	2012	2013	2014
			vs BENCHMARK					
1-ALTERNATIF BANK TYPE B VARIABLE FUND								
			Jensen alpha					
			Sharpe ratio	-0.74	-7.13	-3.48	-	-
			Sortino ratio	2.87	0.93	3.93	-	-
			Treynor Measure					
2-ATA FOREIGN SECURITIES BALANCED FUND								
			Jensen alpha	-	45.26	11.1	-2.01	-372.79
			Sharpe ratio	-0.95	-3.82	2.75	-0.68	-0.74
			Sortino ratio	1.36	0.67	2.31	1.08	0.83
			Treynor Measure	-	0	0.11	-0.4	0
3-DENIZBANK TYPE B VARIABLE ACCUMULATION								
			Jensen alpha	-	-15.42	204.53	-3.57	1.02
			Sharpe ratio	1.36	-1.68	2.5	-1	1.05
			Sortino ratio	1.37	0.79	1.61	0.78	1.56
			Treynor Measure	-	-0.18	-200.33	-0.1	0.1
4-FINANSBANK LONG-TERM VARIABLE FIX INCOME FUND								
			Jensen alpha	4.88	0.45	5.4	1.29	3.25
			Sharpe ratio	2.18	-1.2	2.83	-1.59	0.72
			Sortino ratio	1.75	1.31	2.25	0.75	1.36
			Treynor Measure	0.08	-0.09	0.1	-0.15	0.05
5-GARANTI BANK TYPE B OTTOMAN GOLD FUND								
			Jensen alpha	-	-	-	-56.82	-1.95
			Sharpe ratio	1.71	1.25	-0.79	-0.96	-0.29
			Sortino ratio	1.05	0.94	1.15	1.26	1.11
			Treynor Measure	-	-	-	-804.73	-0.05
6-HALKBANK TYPE B SHORT-TERM BILL AND BONDS FUND								
			Jensen alpha	-	-	-	-1.86	-1.81
			Sharpe ratio	-	-	-	-4.08	-5.01
			Sortino ratio	-	-	-	5.05	-
			Treynor Measure	-	-	-	-0.13	-0.08
7-OYAK SECURITIES TYPE B LIQUID FUND								
			Jensen alpha	-	-	-	-	-
			Sharpe ratio	-48.3	-18.11	-6.01	-2.4	-
			Sortino ratio	-	-	-	-	-
			Treynor Measure	-	-	-	-	-
8-TEB TYPE B VARIABLE FUND								
			Jensen alpha	-	-	-	-	-
			Sharpe ratio	-1.88	-4	0.66	-1.93	-2.5
			Sortino ratio	1.66	0.83	3.56	0.84	8.12
			Treynor Measure	-	-	-	-	-
9-TEKSTILBANK TYPE B VARIABLE FUND								
			Jensen alpha	1.4	-5.17	-3.66	-15.56	-
			Sharpe ratio	0.61	-3.15	-1.59	-3.05	-
			Sortino ratio	4.56	0.56	1.39	0.44	-
			Treynor Measure	-0.97	-0.13	-0.07	-0.35	-
10-VAKIF BANK TYPE B LIQUID POOL FUND								
			Jensen alpha	-	-	-	-	-
			Sharpe ratio	-41.76	-18.76	-4.1	-5.65	-1.35
			Sortino ratio	-	-	-	-	-
			Treynor Measure	-	-	-	-	-

Source: Bloomberg Professional

CHAPTER 6

CONCLUSION

Risk-adjusted performance evaluation of mutual funds commenced to popular during 1960's and many theories and models have been developed by researchers in order to be able to evaluate performance of mutual funds in for many years. Developing technology, increasing investor consciousness to be informed associated with performance of investment instruments, high competition in the market, the diversity and complexity of investment vehicles have been some of the key factors for maintaining transparency on the performance evaluation of fund products.

This study evaluates risk-adjusted performance of Type A and Type B mutual funds throughout 59 weeks starting from January 2010 until January 2015. As a methodology, risk-adjusted performance measures Sharpe ratio, Jensen Alpha, Treynor and Sortino ratio were employed on aggregate twenty mutual funds in Turkey. After obtaining secondary data from the Bloomberg Professional, more concrete results have been reached on this study.

Fundamentally, Sharpe Ratio results show that Type A mutual fund's Sharpe Ratio was higher than overall Type B mutual fund's Sharpe Ratio over the five years. The superior Sharpe Ratio period was 2012 and the results varied between 2.2 and 4.28. A Sharpe Ratio 2 and better are assumed very good indicator and also, 3 and higher than means excellent Sharpe Ratio. On the other hand, remarkable inconsistency was discovered on Type A mutual funds showing each year positive and negative excess return to the funds. In

addition to this, majority of Type B mutual funds generated negative Sharpe Ratio to the funds due to the providing less return from the risk-free rate which causes to negative excess return for the given period of time.

Jensen Alpha results revealed that Type A mutual funds produced superior alpha in 2012 comparison with other years and relative to Type B mutual funds over the five years period. Type A mutual funds managers provided negative return and could not achieve outperformance of the market benchmark in 2011, 2013 and 2014. Additionally, majority of Type B mutual funds generated negative alpha as well throughout five years period, although lack of sufficient data regarding some of mutual fund's Jensen alphas prevented to be conduct complete analysis. Overall, it can be concluded that despite of only superior return occurred in 2012, neither Type A funds nor Type B fund's managers could not beat the market benchmark consistently demonstrating both negative and positive alpha in each year over the five years period.

Treynor measure findings revealed that only three Types A mutual fund were able to produce higher than market ratio within the ten mutual funds over the 59 weeks performance evaluation period. However, none of Type B mutual fund could achieve the acceptable Treynor measure throughout the five years. Hence, taking into account both Type A and Type B mutual funds Treynor measure results can be asserted that only three Type A funds were managed through aggressive strategy against market risk and these funds only were able earn abnormal return to the fund once in a five years period whereas, the rest of mutual funds were managed more defensive toward the market risk.

The low Treynor measure results of Type B mutual funds might attributable to the holding of Type B funds. It mainly invests in Government Bonds, Treasury Bills and Repo market instrument which provides less return due to having less risk in the portfolio.

Sortino Ratio results exposed that both Type A funds and Type B funds supplied positive findings starting from January 2010 to January 2015. It was also discovered that Type A fund's Sortino Ratios much more higher than Type B funds along with five years period. Furthermore, Sortino Ratio was peak by both of two Types of funds in 2012 result in findings. The fact that Sortino Ratio does consider downside deviation of the portfolio makes itself important due to investor are more concern with negative divergences than positive ones. Thus, as a modification of Sharpe Ratio, it was integrated the performance evaluation process of mutual funds on this study.

The previous researches which have been done associated with performance evaluation of mutual funds in Turkey were also demonstrated on similar results with this study findings and it strengthen the discussion behind the performance of different types of mutual funds in Turkey. Yalcin (2012), Parlak (2014) and Samirkas and Duzakin (2012) find out that fund managers were lack of ability in terms of selecting right investment instruments or timing the market due to the inconsistent results of each ratios and also Type A funds were much more successful compared to Type B funds.

6.1 Limitations

In order to be able to obtain a feasible and sound results from the risk-adjusted measures and to eliminate the potential miscalculation on Excel, Bloomberg Professional was employed in this study whereas, approximately 90 of ratios could not be identified and reasons could not be explained and thus it can be stated the fact that around 90 of ratio could not be able to considered in this study may lead to increase potential misinterpretation or might cause to hardly identify whether a sound persistency exist or not in the selected data. In addition to this, the amount of mutual funds determined for this study might be assumed as restricted because there were 483 mutual funds as of 2014-end in Turkey yet, only twenty mutual funds have been employed in this study.

6.2 Recommendations

Many researches have been carried out considering traditional risk-adjusted measure to evaluate performance of mutual funds not only in Turkey but also in the worldwide. Although risk-adjusted performance evaluation methods are assumed acceptable by the many researchers, some weaknesses have also been discussed for many years. Fundamentally, Yildiz (2006) claims the fact that it does only evaluate based on risk-return factors also Basso and Funari (2001) assert that traditional performance evaluation methods do not take into account the subscription and redemption costs demand by the investment that conduce the total return on the investment.

Based on the above judgement, there is an alternative performance evaluation method which called Data Envelopment Analysis (DEA) introduced by Charnes, Cooper and Rhodes in 1978. This method is widely used to evaluate performance of mutual funds both in Turkey and worldwide. Basso and Funari (2001) underpin to the DEA methods that it enables to identify mutual funds' performance indexes which can consider several inputs and therefore does take into account different risk measures and all the investment costs such as redemption fees and subscription costs. Thus, in order to inhibit potential mistake on the funds evaluation and also to strengthen the results of this study Data Envelopment Analysis methods can be applied for the possible future studies.

Another alternative method or to evaluate risk-adjusted performance; Modigliani measure (*M Squared*) might be used instead of Sharpe Ratio or addition to Sharpe ratio. As a modification of Sharpe Ratio, Modigliani measure is easier to interpret Sharpe Ratio due to the fact that it has benefit of being in units of percent return Simon (1998).

As a final recommendation, Simon (1998) information ratio which widely used not only measures a portfolio manager's ability to produce excess return relative to a benchmark but

also undertakes to detect the consistency of the investor might be one of the preferable ratio instead of using Sharpe ratio or may be added the available methods to tighten findings of the study.

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