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**PERFORMANCE EVALUATION OF SHARE MUTUAL
FUNDS IN TURKEY**

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THESIS APPROVAL PAGE



DECLARATION

I hereby declare that this master's thesis titled as "Performance Evaluation of Share Mutual Funds in Turkey" has been written by myself in accordance with the academic rules and ethical conduct. I also declare that all materials benefited in this thesis consist of the mentioned resources in the reference list. I verify all these with my honour.



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ABSTRACT
Master's Thesis
Performance Evaluation of Share Mutual Funds in Turkey
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The number of investment opportunities that investors can invest their savings has increased with the development of capital markets and the occurrence of new financial instruments in capital markets. Furthermore, the development of technology has facilitated transactions in financial markets. However, it is becoming increasingly difficult for investors to make optimal investment decisions by choosing among these financial instruments providing different risk-return trade-offs in different markets. Mutual funds invest in a vast number of different securities, which provide different risk-return trade-offs, with the money that they pool from investors and they provide professional investment management services. Thus they enable investors to save time and obtain professional investment management, which they may not be able to carry out on their own.

This study aims to evaluate the performance of the share mutual funds operating in Turkey between 2006 and 2018. In this regard, data on 34 share mutual funds have been collected to evaluate fund performances and measure fund managers' security selection abilities and market timing abilities by using the single index and multi index performance measurement models.

The empirical findings exhibit the performance ranking of funds may vary according to which single index model is used. In addition, fund managers are found to be mostly not successful in terms of security selection and market timing and none of the fund managers exhibits success in security selection and market timing ability, simultaneously.

As a result, professional fund managers were found to be less successful than expected.

Keywords: Mutual Funds, Risk, Return, Performance Evaluation.



ÖZET
Yüksek Lisans Tezi
Türkiye’deki Hisse Senedi Yatırım Fonları’nın Performanslarının
Değerlendirilmesi
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Yatırımcıların tasarruflarını değerlendirebileceği yatırım fırsatlarının sayısı, sermaye piyasalarının gelişmesi ve sermaye piyasalarında yeni finansal araçların ortaya çıkmasıyla artmıştır. Ayrıca teknolojinin gelişmesi de finansal piyasalarda işlem yapmayı kolaylaştırmıştır. Ancak farklı piyasalarda farklı risk-getiri düzeyleri sunan bu finansal entrümanlar arasında seçim yaparak uygun yatırım kararları vermek yatırımcılar açısından giderek zorlaşmaktadır. Yatırım fonları yatırımcılardan topladığı paralar ile farklı risk – getiri düzeylerindeki yatırım araçlarına yatırım yaparak profesyonel yönetim hizmeti sunmakta ve bu şekilde yatırımcılara hem zaman tasarrufu hem de kendi başlarına gerçekleştiremeyecekleri profesyonel yatırım yönetimi olanağı sağlamaktadır.

Bu çalışma, Türkiye’de 2006-2018 yılları arasında faaliyet gösteren hisse senedi yatırım fonlarının performanslarını değerlendirmeyi amaçlamaktadır. Bu bağlamda, 34 yatırım fonunun performanslarının değerlendirilmesi ve fon yöneticilerinin menkul kıymet seçim yetenekleri ve piyasa zamanlama kabiliyetlerini ölçmek için tek kriterli modeller ve çok kriterli performans ölçüm modellerinden yararlanılmıştır.

Amprık sonuçlar yatırım fonlarının performans sıralamasının kullanılan tek kriterli modellere göre farklılaşabildiğini göstermektedir. Ayrıca menkul kıymet seçimi ve piyasa zamanlaması açısından fon yöneticilerinin genellikle

başarılı olmadıkları ve hiçbir fon yöneticisinin menkul kıymet seçim yeteneđi ve piyasa zamanlama yeteneđi başarısını aynı anda gösteremediđi görölmüştür. Sonuç olarak profesyonel fon yöneticilerinin beklenildiđi kadar başarılı olmadığı tespit edilmiştir.

Anahtar Kelimeler: Yatırım Fonları, Risk, Getiri, Performans Deđerlendirmesi.



PERFORMANCE EVALUATION OF SHARE MUTUAL FUNDS IN TURKEY

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ABBREVIATIONS

APT	Arbitrage Pricing Theory
BIST	Borsa Istanbul
CAPM	Capital Asset Pricing Model
CBRT	Central Bank of the Republic of Turkey
CMB	Capital Markets Board of Turkey
CML	Capital Market Line
CMLw	Turkish Capital Market Law
CPIF	Comuniquue on Principles of Investment Funds
CRSP	The Center for Research in Security Prices
EU	European Union
NAV	Net Asset Value
NYSE	New York Stock Exchange
PDP	Public Disclosure Platform
PPD	Principles of Public Disclosure
SML	Security Market Line
S&P	Standards & Poors
TBMM	The Grand National Assembly of Turkey
TCM	Turkish Capital Market
TSPB	Turkish Capital Markets Association
USA	United States of America

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INTRODUCTION

Advanced financial markets are one of the most important indicators of economic development of any country. These markets are efficient mechanisms as they help the economy through deploying savings of individuals. The depth of the financial markets is proportional to the level of development of the economies where the markets are located (Bayraktar, 2014: 1). Mutual funds are one of the leading factors that can be effective in the development of financial markets. Mutual funds can be defined as portfolios which are actively managed by professional portfolio managers, namely fund managers (Patel and Sharma, 2016: 62).

In today's world, because of the rapid developments in technology, the globalization of financial markets and increase in types of financial instruments, the investment process is getting more difficult especially for individual investors. The growing investment needs of small investors who do not have sufficient knowledge and time to form their own portfolios have led to the emergence and development of mutual funds over time. The appearance of many professionally managed mutual funds in the financial markets has led to the need to evaluate the performance of mutual funds between investors. In this regard, the determination of which mutual funds outperform other alternative funds has become an important issue for investors.

By reason of competitive conditions and the increasing diversity in the financial sector, experts and fund managers are required to be more precise about fund performance. Evaluation of fund performance resulting from investment decisions based on various analysis methods and the process of reviewing investment decisions according to the results of the analysis has been a very popular issue among many researchers for years and even today. The concept of evaluation of portfolio performance has undergone tremendous changes over the years.

The evaluation of funds or portfolio performances is one of the issues that is commonly addressed in financial literature (Aragon and Ferson, 2006: 85). While it initially was a performance-oriented approach based on only return (Erzurumlu and Gürsoy, 2001: 44), the concept of risk was taken into account after the development of the Capital Asset Pricing Model (CAPM) (Cristina and Mihai, 2015: 61). It is possible to reconcile the risk being neglected initially because it was not exactly

known how to measure the risk. Performance evaluation is one of the most important elements of the investment process for all kinds of investments and it is an irrevocable part of the investment decision-making process for today.

Determining which elements affect the performance is also another point to be considered. Current investors of mutual funds decide to sell their shares of the fund according to the performance assessment, while other potential investors direct their savings to high-performance funds. Although past performance is not a guarantee of future performances in any way, investors still make investment decisions based on these assessments (Palmiter and Taha, 2012: 317). On the other hand, fund managers can also observe their own performances and gain prestige and compensation with well-managed funds, thus ensure that there is more cash in the fund. In addition, fund managers can compete with each other, and in this way, a general activity increase in the investment fund industry is achieved (Maginn et al, 2007: 718).

In light of the above explanations, the main objective of this study is to evaluate the performance of shares mutual funds in Turkey for the period from 2006 to 2018 and measure the security selection abilities and market timing abilities of these mutual funds' managers. In doing so, the single index models that take into consideration the security selection ability of the portfolio manager and the multi index models that take into consideration the ability of security selection and market timing abilities together are utilized in the analysis of the performance of share mutual funds. Mutual funds aim to invest in the right instruments according to economic conditions. Hence, mutual fund performances were analyzed comparatively to test whether they determine their investment preferences successfully and consequently. In this regard, this study is one of the rare studies which examine the performance evaluation of mutual funds, which is formed according to the new fund classification criteria stated in Communiqué on Principles of Investment Funds (CPIF), after the radical changes made in the Turkish Capital Market Law (CMLw) and CPIF in Turkey in 2015. In addition, in this study, CMAX crisis indicator, which is not commonly used in the literature, is applied to determine the crisis periods that occurred in Borsa Istanbul (BIST)-100 index between 2006 and 2018 in order to use in the dummy regression model as a dummy variable.

Therefore, it is believed that this study will have a significant and different contribution to the literature on performance evaluation of mutual funds.

This thesis consists of three chapters and conclusion. The first chapter aims to introduce mutual funds. The focus is on the concept of mutual funds, the principle and functions of funds, types, benefits, and etc.. The description and classification of mutual funds in Turkey according to the legal legislations and information about the current asset values and the historical development of mutual funds both in the world and in Turkey are covered.

The second chapter which is on the performance measurement models begins with risk, return and performance concepts and continues with portfolio performance measurement methods that guide the investors in choosing among the mutual funds in the portfolio formation process. After analyzing the portfolio performance measurement methods, a literature review is provided covering the studies conducted in Turkey and internationally on performance evaluation of mutual funds.

In the third and the final chapter of the study, the performance analysis of the share mutual funds in Turkey and the empirical findings are presented. The interpretation of the results and a general evaluation are provided in this part as well.

The conclusion includes discussion of the empirical results and the contribution of the study to the literature. Suggestions for further research are also presented in this part.

CHAPTER ONE

MUTUAL FUNDS INDUSTRY

Financial markets exhibit a rapid globalizing appearance recently. All kinds of political and economic fluctuations in the world have caused lack of stability in national and international markets. Therefore all kinds of individual or institutional investors have attempted to develop a variety of tools and methods to achieve the highest return on fluctuating markets. One of these stated tools is mutual funds.

A mutual fund is a combination of many financial instruments such as bonds, stocks or other funds. Mutual funds are collective investment undertakings that pool money from many investors for the purpose of investing in a diversified portfolio of securities such as stocks, bonds, short-term money-market instruments, other assets, or some combination of these securities (Bodie et al, 2005: 108). In other words, mutual funds are institutions that serve as a key financial intermediary on behalf of others.

In this chapter of the study; in addition to the general structure, establishment, and benefits of mutual funds, the historical development of mutual funds in the World and operations of mutual funds in Turkey will be discussed.

1.1. MUTUAL FUNDS IN THE WORLD

The number of instruments that investors can invest is increasing rapidly and hence mutual funds have become one of these instruments. Mutual funds are a wide-spread method for investment and an applicable investment instrument for individual investors who do not have expertise and time to evaluate and invest in expensive stocks. This is because mutual funds enable investors to access diversified and professionally managed portfolios at a relatively low cost (Block and Hirt, 2003: 526-527).

Mutual funds bring together many investments aimed at achieving effective access to identified financial targets and have been in existence for many years in developed countries (Klapper et al, 2004: 2). Small investors perceive mutual funds managed by professionals as reasonable investment alternatives for a variety of

reasons, such as their insufficient knowledge of the markets, lack of sufficient time to manage a portfolio investment, or the difficulty in choosing and managing securities due to increasing investment alternatives in the capital markets. In this context, mutual funds can be defined as portfolios created to meet the needs of investors (Dash et al, 2017: 209). Investors perceive the professional fund managers as having experience and by interpreting developments in an accurate way or exhibiting stable performance. Hence, investors expect the fund managers to improve fund performance by creating the most appropriate fund combination to understanding the markets well and to demonstrating market timing ability in order to revise fund combinations appropriately when necessary. Thus, mutual funds have become very popular and are actively present in all capital markets in the world.

1.1.1. Development of Mutual Funds in The World

Converting the funds formed by small savings to securities by means of capital market to provide income and channeling those funds to industrial investments is the most important and interesting process of the capitalist economy. This service is carried out by intermediary institutions in the west which are called as investment instruments. There are financing agencies that convert the funds created by small savings to securities in capital markets in Anglo-Saxon (European Land) countries. They are investments trusts and mutual funds (Tezcan, 1999: 22).

Securities investment funds in the world which are called as “Unit Trust” in the United Kingdom, “Mutual Fund” in the United States of America (USA), “Fonds Commun de Placement” in France, ”Anglefonds“ in Switzerland and “Insvestmentfond” in Germany have quite a long history (Karşlı, 2004: 173). The first appearance of the investment fund was in land Europe and was founded in 1822 in Belgium under the name "Société de Belgique". On the other hand, it is stated that the first investment funds in today's sense were established in 1868 in England (Ceylan and Korkmaz, 2006: 131; Civan, 2007: 54). The first investment fund in England is a company that was established in London in 1868 under the name "The Foreign and Colonial Government Trust". The purpose of the foundation of this fund was to provide small investors with the opportunity to invest in cooperatively and to

disperse risk among them. More than 100 mutual funds were founded in the early 1900s. One-third of these funds were active in Scotland. The mutual fund which was first founded in Scotland and called as “The First Scottish American Investment Trust” went into action in 1873 (Hutson, 2005: 440). The unit trusts the number of which rose rapidly afterwards were influenced negatively by the Second World War and by the period of financial inconsistency which appeared in the 1970s. Therefore some unit trusts went into liquidation (Bangassa, 1999: 1141).

Mutual funds started to be founded in the USA in the late 1800s. The number of mutual funds started to increase in the 1920s and the first mutual fund, which is named as “The International Securities Trust of America”, was founded in the year 1921. Funds firstly were founded as closed-end whereas they started to be founded open-end in the 1920s. The first open-end mutual fund was founded in Boston, the U.S.A. in 1924. The Massachusetts Investor Trust, which is regarded as the first mutual fund by many investors, went into action in March 1924 (Hutson, 2005: 440).

The growth of mutual funds slowed down during the years of crisis which started in 1929 (Tevfik, 1995: 3). It was the late 1960s that the development of mutual funds started again. The total number of mutual funds worldwide by the end of the 1960s was around 270. Their asset size reached to USD 48 million. Mutual funds have developed rapidly since the 1960s and have reached an important position in the financial markets (Şahin, 2008: 29). Money market mutual funds developed a lot in the USA. after the 1980s. That was why banks had hard times. However, banks had the opportunity to pick up savings again by having the authority to open monetary market saving accounts in 1982 (Çetin, 2010: 22).

It is specified that half of the world's investment funds are in the USA and UCITS, which are mutual funds and investment trusts comply with the directives issued by the European Union (EU) in 1985 that regulates the functioning principles of institutions such as mutual funds and investment trusts, are 80 % of the European fund market (TSPB, 2006: 1). Luxembourg and Ireland have offered a number of advantages, primarily tax, and made Europe a center of investment funds. There are significant differences in the savings preferences of investors in European countries. While investors in Sweden used 22 % of their savings in mutual funds, the British people used 53 % of their savings in insurance policies and pension products. While

the equity funds were usually common in Europe, in Turkey liquid funds have been mostly preferred. This stems from the fact that Turkey is a developing country. Therefore, savings owners or investors prefer liquid funds that have short maturity and easily convertible to cash. (TSPB, 2006: 1-2).

Although savings choices of the investors show important structural differences, the interest for mutual funds worldwide is increasing year by year. This rising interest for mutual funds has caused monetary and capital markets to have a deeper, wider and flexible structure. Table 1 shows the number of mutual funds in selected countries from the year 2006 to the end of 2018.

Mutual funds have an important place within collective financing agencies considering their number. As shown in Table 1, the total number of funds worldwide is 59,667 by the end of 2006. The distribution of the number of funds among continents is 14,474 in America continent, 32,063 in Europe, 12,380 in Asia & Pacific and 750 in South Africa. The number of funds reached up to 117,464 worldwide by the end of 2018. The range of the number of funds among continents is 28,325 in America continent, 54,576 in Europe, 32,996 in Asia & Pacific and 1,567 in South Africa. The worldwide share Turkey holds is 0.34 % on the number of funds basis of the end of 2018. When compared to America the ratio is 1.41 % whereas the share of Turkey in Europe is 0.73 % considering the number of funds.

Table 1: The Number of Mutual Funds Worldwide

Countries	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
America	14.474	15.460	16.459	16.896	17.951	19.706	21.047	21.977	22.919	25.186	25.854	27.209	28.325
USA	8.117	8.027	8.022	7.663	7.548	7.580	7.582	7.707	7.923	9.710	9.782	9.788	10.066
Argentina	223	241	253	252	254	281	291	297	302	346	420	487	544
Brazil	2.907	3.381	4.169	4.744	5.618	6.513	7.468	8.072	8.560	8.783	9.224	9.774	10.257
Canada	1.764	2.038	2.015	2.075	2.117	2.655	2.866	2.963	3.164	3.283	3.298	3.867	4.086
Costa Rica	100	93	85	64	68	63	66	66	66	65	67	67	71
Mexico	437	420	431	407	434	464	488	487	486	499	524	553	575
Chile	926	1.260	1.484	1.691	1.912	2.150	2.286	2.385	2.418	2.500	2.539	2.673	2.726
Europe	32.063	33.909	35.318	33.945	34.334	34.306	33.526	33.779	34.456	51.657	51.967	53.286	54.576
Germany	1.199	1.462	1.675	2.067	2.106	2.051	2.059	2.012	2.039	5.604	5.678	5.863	6.149
Austria	948	1.070	1.065	1.016	1.016	1.003	995	981	938	1.596	1.575	1.580	1.603
Belgium	1.549	1.655	1.828	1.845	1.797	1.723	1.529	1.432	1.209	1.164	962	890	735
Czechia	52	66	76	78	80	80	80	85	106	128	129	147	159
Denmark	494	500	489	483	490	500	495	510	530	532	558	565	599
Finland	376	379	389	377	366	368	375	369	352	371	372	380	404
France	8.092	8.243	8.301	7.982	7.791	7.744	7.392	7.154	7.082	11.122	10.952	10.860	10.804
United Kingdom	1.903	2.057	2.371	2.266	2.204	1.941	1.922	1.910	1.920	2.871	2.802	2.948	3.033
Ireland	2.531	2.898	3.097	2.721	2.899	3.085	3.167	3.345	3.462	6.201	6.470	6.831	7.285
Spain	3.235	2.940	2.944	2.588	2.486	2.474	2.349	2.267	2.238	2.238	2.342	2.332	2.584
Sweden	474	477	508	506	504	508	456	484	510	471	496	519	528
Switzerland	609	567	572	509	653	664	667	765	843	860	858	918	887
Italy	989	924	742	675	650	659	600	661	719	713	760	832	866
Liechtenstein	233	391	335	348	409	437	535	657	587	1.184	1.287	1.367	1.566
Luxembourg	7.919	8.782	9.351	9.017	9.353	9.462	9.435	9.500	9.839	14.108	14.211	14.728	14.898

Hungary	0	0	0	0	0	0	0	0	307	316	306	306	298
Norway	524	511	530	487	507	507	406	573	616	700	720	754	865
Poland	157	188	210	208	214	226	259	264	278	391	423	428	440
Portugal	175	180	184	171	171	173	157	153	184	399	373	344	136
Romania	32	41	52	51	56	105	62	64	72	74	75	74	78
Slovakia	43	54	56	54	58	63	58	54	87	88	87	87	86
Turkey	282	294	304	286	311	337	351	373	395	387	396	387	398
Greece	247	230	239	210	213	196	177	166	143	139	135	146	175
Asia and Pacific	12.380	13.685	14.909	14.795	15.265	16.198	16.703	18.375	20.373	26.510	28.833	30.196	32.996
China	0	341	429	547	660	831	1.065	1.415	1.763	2.558	3.654	4.361	4.957
Philippines	38	40	43	41	43	47	48	47	52	55	57	60	61
South Korea	8.030	8.609	9.384	8.703	8.687	9.064	9.121	9.876	11.063	11.918	12.626	11.828	13.258
India	468	555	551	590	658	680	692	699	723	804	795	807	831
Japan	2.753	2.997	3.333	3.656	3.905	4.196	4.384	4.922	5.404	9.804	10.915	11.662	12.294
Pakistan	31	64	83	96	125	137	139	152	159	160	171	177	192
Taiwan	447	456	443	460	487	534	554	570	577	602	0	714	774
New Zealand	613	623	643	702	700	709	700	694	632	609	615	587	629
Africa	750	831	884	904	943	947	967	1.062	1.171	1.327	1.520	1.626	1.567
South Africa	750	831	884	904	943	947	967	1.062	1.171	1.327	1.520	1.626	1.567
TOTAL	59.667	63.885	67.570	66.540	68.493	71.157	72.243	75.193	78.919	104.680	108.174	112.317	117.464

Source: Capital Markets Board of Turkey (CMB), International Economic and Financial Indicators, (March, 2019).

Table 2 shows the portfolio volume of mutual funds worldwide. The worldwide portfolio volume which is around USD 21,2 trillion by the end of 2006 has risen to EUR 41 trillion in the year 2018. The portfolio volume of mutual funds in America which is USD 11,5 trillion in 2006 has increased to EUR 20,6 trillion in the year 2018. This number which is USD 7,8 trillion in Europe in 2006 has risen to EUR 14.4 trillion in 2018. The portfolio volume which is USD 1,82 trillion in Asia and Pacific by the end of 2006 has risen to EUR 5,61 trillion by the end of the year 2018. It is seen that the volume of money bag which is USD 78,026 in South Africa in 2006 has increased to EUR 135,367 by the end of 2018.

America has the largest portfolio volume worldwide with a share of approximately 54 %. Europe is the top second with a share of nearly 37 % whereas Asia and Pacific are the third on the list with a share of 9 %.

Table 2: Total NAVs of Mutual Funds Worldwide

Countries	2006 (million USD)	2007 (million USD)	2008 (million USD)	2009 (million USD)	2010 (million USD)	2011 (million USD)	2012 (million USD)	2013 (million USD)	2014 (million USD)	2015 (million EUR)	2016 (million EUR)	2017 (million EUR)	2018 (million EUR)
America	11.469.062	13.422.271	10.581.988	12.572.761	13.591.715	13.523.269	15.131.938	17.149.824	18.005.079	17.957.514	20.004.011	20.739.515	20.639.902
USA	10.396.508	12.000.645	9.603.649	11.112.970	11.831.334	11.626.493	13.043.666	15.017.682	15.852.341	16.306.052	17.899.730	18.466.594	18.408.328
Argentina	6.153	6.789	3.867	4.470	5.179	6.808	9.185	11.179	15.630	15.096	19.153	24.358	13.888
Brazil	418.771	615.365	479.321	783.970	980.448	1.008.928	1.070.998	1.018.641	989.542	682.952	1.006.454	1.032.301	1.058.023
Canada	566.298	698.397	416.031	565.156	636.947	753.606	856.504	940.580	981.804	817.131	944.967	1.077.315	1.016.130
Costa Rica	1.018	1.203	1.098	1.309	1.470	1.266	1.484	1.933	2.092	2.327	2.179	2.039	1.851
Mexico	62.614	75.428	60.435	70.659	98.094	92.743	112.201	120.518	119.504	97.309	87.686	91.261	95.833
Chile	17.700	24.444	17.587	34.227	38.243	33.425	37.900	39.291	44.166	36.647	43.842	45.647	45.849
Europe	7.795.762	8.923.470	6.226.797	7.539.487	7.896.507	7.212.524	8.224.332	9.368.660	9.567.847	12.625.079	13.384.524	14.781.239	14.380.752
Germany	340.325	372.072	237.986	317.543	333.713	293.011	327.640	382.976	359.867	1.653.122	1.796.530	1.927.834	1.920.092
Austria	128.236	138.709	93.269	99.628	94.670	81.038	89.125	90.633	83.522	138.880	143.192	149.419	144.136
Belgium	137.291	149.842	105.057	106.721	96.288	81.505	81.651	91.528	90.211	84.610	79.968	98.327	85.675
Czechia	6.490	7.595	5.260	5.436	5.508	4.445	5.001	5.131	5.563	7.176	8.444	10.692	10.929
Denmark	95.620	104.082	65.182	83.024	89.800	84.891	103.506	118.702	121.092	102.424	110.909	121.602	120.727
Finland	67.804	81.136	48.750	66.131	71.210	62.193	73.985	88.462	86.621	81.153	88.945	92.552	87.341
France	1.769.258	1.989.690	1.591.082	1.805.641	1.617.176	1.382.068	1.473.085	1.531.500	1.391.271	1.682.808	1.783.830	1.929.115	1.812.023
Netherlands	108.560	113.759	77.379	95.512	85.924	69.156	76.145	85.304	75.751	669.694	732.367	769.840	749.940
United Kingdom	755.156	897.460	504.681	729.141	854.413	816.537	985.517	1.166.834	1.182.184	1.454.560	1.433.427	1.596.722	1.469.744
Ireland	855.011	951.371	720.486	860.515	1.014.104	1.061.051	1.276.601	1.439.867	1.547.343	1.898.825	2.084.748	2.396.089	2.421.457
Spain	367.918	396.534	270.983	269.611	216.915	195.220	191.284	248.234	274.049	252.333	266.413	292.927	283.717

Sweden	176.943	194.955	113.331	170.277	205.449	179.707	205.733	252.878	279.094	257.166	271.712	296.804	293.586
Switzerland	159.515	176.282	135.052	168.260	261.893	273.061	310.686	397.080	407.890	419.915	451.417	465.913	463.734
Italy	452.798	419.687	263.588	279.474	234.313	180.754	181.720	215.553	238.327	190.931	192.946	217.114	206.554
Liechtenstein	17.315	25.103	20.489	30.329	35.387	32.606	31.951	36.235	28.875	41.276	43.282	45.588	44.428
Luxembourg	2.188.278	2.685.065	1.860.763	2.293.973	2.512.874	2.277.465	2.641.964	3.030.665	3.208.264	3.506.201	3.701.076	4.159.614	4.064.644
Hungary	8.523	12.577	9.188	11.052	11.532	7.193	8.570	12.158	11.375	13.617	13.833	14.160	13.525
Norway	54.065	74.709	41.157	71.170	84.505	79.999	98.723	109.325	112.223	94.173	108.108	115.682	120.570
Poland	28.957	45.542	17.782	23.025	25.595	18.463	25.883	27.858	26.098	29.656	28.054	34.562	34.732
Portugal	31.214	29.732	13.572	15.808	11.004	7.321	7.509	9.625	8.564	20.456	19.077	19.759	11.853
Romania	247	390	326	1.134	1.713	2.388	2.613	4.000	4.932	4.627	4.812	4.858	4.128
Slovakia	3.171	4.762	3.841	4.222	4.349	3.191	2.951	3.292	4.183	5.697	5.887	6.578	6.605
Turkey	15.463	22.609	15.404	19.426	19.545	14.048	16.478	14.078	15.292	11.837	11.647	10.994	6.469
Greece	27.604	29.807	12.189	12.434	8.627	5.213	6.011	6.742	5.256	3.942	3.900	4.494	4.143
Asia and Pacific	1.825.457	2.859.907	2.037.536	2.715.234	3.067.323	2.921.276	3.322.198	3.356.204	3.646.275	4.352.720	4.703.328	5.413.610	5.612.559
Australia	864.254	1.192.992	841.133	1.198.838	1.455.850	1.440.128	1.667.128	1.624.081	1.601.132	1.397.367	1.530.257	1.787.753	1.699.942
China	0	434.063	276.303	381.207	364.985	339.037	437.449	460.332	708.884	1.160.219	1.164.538	1.408.305	1.544.626
Philippines	1.544	2.090	1.263	1.488	2.184	2.363	3.566	4.662	5.078	4.619	4.645	4.938	4.259
South Korea	251.930	329.979	221.992	264.573	266.495	226.716	267.582	285.173	312.150	315.324	351.580	376.791	404.492
India	58.219	108.582	62.805	130.284	111.421	87.519	114.489	107.895	134.630	154.484	205.678	256.305	259.273
Japan	578.883	713.998	575.327	660.666	785.504	745.383	738.488	774.126	780.636	1.220.386	1.395.418	1.467.063	1.575.990
Pakistan	2.164	4.956	1.985	2.224	2.290	2.984	3.159	3.464	4.156	3.825	5.085	3.828	3.190
Taiwan	55.571	58.323	46.116	58.297	59.032	53.437	59.192	62.286	58.049	58.002	0	60.731	68.941
New Zealand	12.892	14.924	10.612	17.657	19.562	23.709	31.145	34.185	41.560	38.494	46.127	47.896	51.846
Africa	78.026	95.221	69.417	106.261	141.615	124.976	145.150	142.868	146.474	112.122	138.338	151.556	135.367
South Africa	78.026	95.221	69.417	106.261	141.615	124.976	145.150	142.868	146.474	112.122	138.338	151.556	135.367
TOTAL	21.168.307	25.300.869	18.915.738	22.933.743	24.697.160	23.782.045	26.823.618	30.017.556	31.365.675	35.047.435	38.230.201	41.085.920	40.768.580

Source: CMB, International Economic and Financial Indicators, (March, 2019).

1.1.2. Foundation of Mutual Funds

Mutual funds are generally set up through one of the two legal structures, namely trusts or corporations. These types of legal structures enable mutual funds to be shaped according to the legal regulations of the country, in which they operate (World Bank Group, 2015: 2). All mutual funds are regulated with strict rules which impart transparency and protect the interests of investors. The U.S. Securities and Exchange Commission (SEC) is the regulatory body in the USA, which owns most of the world's mutual fund market, The European Securities and Markets Authority (ESMA) in Europe, Financial Conduct Authority (FCA) in England and The China Securities Regulatory Commission (CSRC) in China are some of the organizations that regulate mutual funds in the world.

1.1.3. Structure and Operation of Mutual Funds

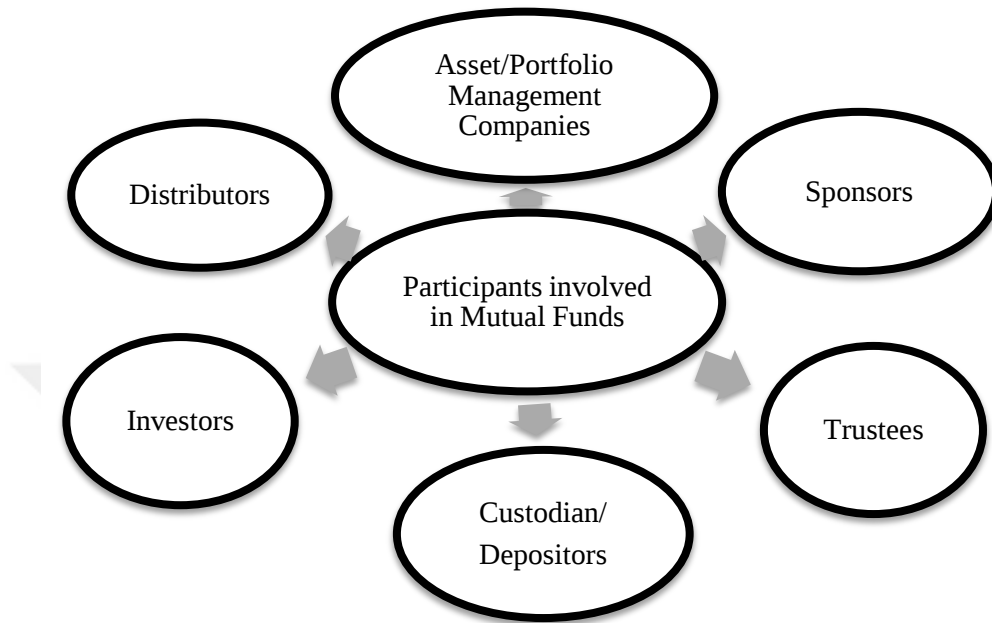
Mutual funds have no legal personality and are typically externally managed. They are investment organizations, just like other companies, with officers and board of directors or trustees in the traditional sense to audit operating activities of the fund and to control corporate objectives of the fund (Investment Company Institute, 2004: 2).

In mutual funds, each investor owns shares. These shares represent a portion of the holdings of the fund and are showed through participation certificates. (Lathashri and Renuka, 2012: 1). Investors need to know the differences among mutual funds, structures, and operations of them before they invest since their savings are being invested in risky assets like stocks, debt instruments, etc. (Gremillion, 2005: 9).

Mutual funds' structure can be differed from country to country and can have special forms in any country. Despite the prevalence of different legal structures, their structures are becoming increasingly similar and comprise of separate participants, namely, sponsor, trustee, asset/portfolio management company, distributor, custodian/depositor, and investor (Kılıç, 2002: 6; Lathashri and Renuka, 2012: 2).

Figure 1 illustrates participants involved in the organizational structure of mutual funds.

Figure 1: Organizational Structure of Mutual Funds



Source: Fink, 2011: 13.

The sponsor in Figure 1 is a corporate company or trust who establishes a mutual fund and responsible to the third parties, public institutions, and holders of the participation certificates due to all process of mutual funds. On the other hand, the sponsor is required to carry out the eligibility criteria specified in the regulations created by the regulatory institutions (Singh and Jha, 2009: 51).

A trustee is responsible for protecting the interests of investors. It monitors operations of the funds and is paid trustee fee for this. It is important to know that the sponsor and trustee are two separate entities. The sponsor is not the trustee and so not the Mutual fund. The Mutual fund is the trustee (Kerwin and Schonfeld, 1993: 114).

Asset/Portfolio Management Company has a very crucial role in the running of funds and operates under the control of the trustee or sponsor. Its main duty is to manage mutual funds by investing in different securities (Gupta and Shukla, 2017: 26).

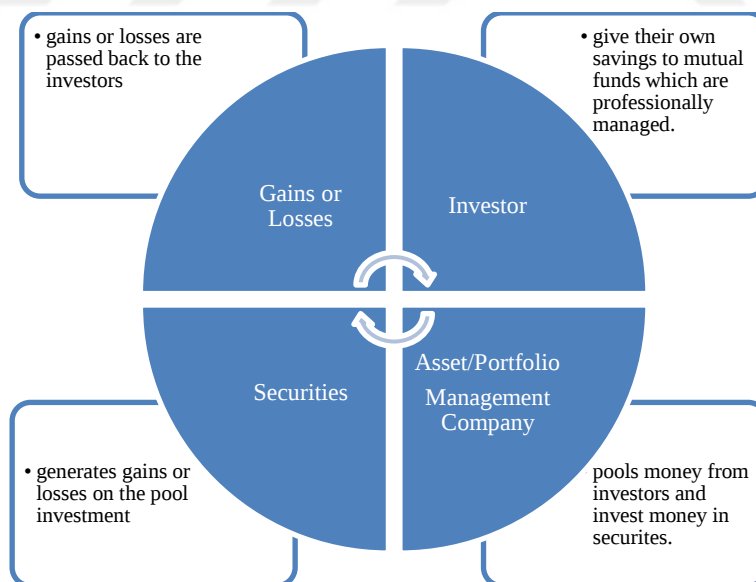
The distributor can be a financial intermediary authorized by the management company and its duty is to bring investors into the mutual funds and it receives a

commission in exchange for this duty. This commission is an expense for the mutual funds (Gremillion, 2005: 10).

Custodian/Depositor is responsible for protecting the portfolio of securities which are invested in by asset/portfolio management company. In addition, depositor or custodian provides an independent record of the investments and also follows up gains or losses declared by asset/portfolio management company. Mutual funds usually use banks as custodian/depositors (Baker et al, 2015: 405).

Figure 2 basically explains the operational flow process of mutual funds. First of all, investors invest their savings into the funds and receive a certificate of participation in return. Secondly, the fund they invested through the portfolio management company evaluates these investments in a diversified securities portfolio. They are expected to gain profits from mutual funds, but they can also have losses. This is the nature of financial investments. And lastly, mutual funds transfer back to investors the profit or loss they receive as a result of the evaluation of the investments.

Figure 2: Operational Flow of Mutual Funds



Source: Joshi, 2013: 126.

1.1.4. Classification of Mutual Funds

There are many kinds of investment funds in the world capital markets such as Exchange Traded Funds, Real Estate Investment Funds, Pension Funds and Venture Capital Investment Funds. Mutual funds are also one of them. The mutual funds usually vary considerably as to their structures, predetermined investment objectives, and management techniques (Carter, 1949: 720). Mutual funds invest in different securities according to each fund's objective and they are classified based on their investment objectives, such as Stock Funds, Debt Instrument Funds, Money Market Funds, and Balanced Funds. Further, they are classified by their structures like open-end funds or close-end funds.

1.1.4.1. Classification Based on Structure of Mutual Funds

There are two basic types of mutual fund companies. These are open-end and close-end funds according to their structures.

a) **Open-End Funds:** The majority of the world's mutual funds have an open-end structure. Open-end funds do not have a fixed maturity date and are open for subscription and redemption at any time during the year. In other words, investors can purchase or redeem open-end funds directly from a portfolio management company on any business day. So, these funds are more liquid funds than close-end funds (Lee et al, 1990: 154). In open-end funds, the price of each share is calculated with Net Asset Value (NAV) which is declared on a daily basis. NAV is calculated by dividing the difference between the market value of securities held and all liabilities by the number of securities (Farkoosh et al, 2012: 17; Lee et al, 1990: 154).

b) **Close-End Funds:** were very popular in the early years of the mutual funds' industry. The maturity of these funds is fixed and usually traded at a discount to NAV. Unlike open-end funds, close-end funds are open for subscription only when they are launched initially and thereafter closed for entry and exit (Cherkes, 2012: 432). In other words, the investor's capital is fixed and the number of its units never changes. Investors who buy shares of close-end funds would be able to exit at any time through the secondary market (Mandacı and Soydan, 2002: 65). As the time

goes by, the shares of open-ended mutual funds in the world's fund industry increased and as the open-end funds' shares of the fund industry increased, the popularity of closed-ended funds gradually decreased (Gremillion, 2005: 3).

Table 3 enables us to make comparison between open-end funds and close-end funds.

Table 3: Number and Portfolio Value of Open-End Funds and Close-End Funds

2018/12	Number	Portfolio Value
Open-End Funds	118,978	\$46,7 trillion
Close-End Funds	506	\$250 billion

Source: Investment Company Fact Book, 2019.

1.1.4.2. Classification Based on Investment Objectives of Mutual Funds

Mutual funds are established in line with predetermined investment objectives and they invest in various securities in order to achieve these objectives. The risk level of the securities in which they invest effects the level of gains or losses of mutual funds. In general, risky assets provide higher returns, but can similarly cause higher losses. Investors who want to gain higher returns can buy shares of mutual fund which includes more risky assets (Manzi and Rayome, 2016: 90). This is all about the investor's preferences. In this respect, mutual funds set up different types of funds that have different risk levels. In general, there are mainly four types of mutual funds in the mutual fund's industry (Investment Company Institute, 2007: 12). These are stock mutual funds (also called as share mutual funds in Turkey), debt instruments mutual funds, money market mutual funds, balanced or hybrid mutual funds. Figure 3 identifies where the various types of funds would be placed according to their risk levels.

Figure 3: Risk Return Relationship according to Fund Types



Source: Bank of Montreal Nesbitt Burns, 2018: 11.

a) **Money Market Mutual Funds:** are considered the least risky investment kind but not risk-free. Such kind of funds invests in highly liquid money market instruments and its purpose is to protect capital and obtain a reasonable return. Money market funds are usually used by institutional investors, corporates, and individuals who want to evaluate their surplus funds for short periods. The period of an investment may be as short as a day. Because of this, they are also called as liquid funds (RBC Wealth Management, 2018: 2).

b) **Debt Instruments Mutual Funds:** The purpose of these funds is to provide investors a steady and regular income. Since these funds invest in securities such as bonds, debentures, government securities, etc. they are less risky compared to stock mutual funds but also offer lower returns. The prices of debt instruments are very sensitive to interest rate changes in the market and therefore, these funds may not guarantee high returns in the short term. However, long term investors may not be concerned about these changes in interest rates (Raza et al, 2011: 4).

c) **Balanced Mutual Funds:** are a balance between stock funds and debt instruments funds. In these funds, the money is invested in both stock shares and debt instruments shares in some proportion. The purpose of these funds is to provide both growth and regular income and so, they are ideal for investors looking for

moderate growth. These funds can be affected by price volatility in the stock markets. However, balanced funds are likely to be less volatile compared to stock funds (Brown and Reilly, 2012: 925).

d) **Stock Mutual Funds:** are funds that invest primarily in companies' stocks whether it was local, regional, national or international stocks. These funds carry a high risk but also has the potential of high returns due to their structures. The investment goal of such funds is to achieve long-term growth. In the mutual fund industry, investors usually prefer stock mutual funds in hopes of achieving capital appreciation and therefore, these funds constitute the vast majority of the mutual fund industry (RBC Wealth Management, 2018: 1).

1.1.5. Advantages of Mutual Funds

Mutual funds offer a great variety of investment instrument for investors who have limited time to spend watching the ups and downs of the markets (Klapper et al, 2004: 2). When investors invest in mutual funds, personal savings are transferred to those who request funds by reducing the resource cost. Mutual funds contribute to the country's economy in many respects and in this regard, mutual funds have some important functions for investors to give up individual stock-picking and turn to mutual funds. The advantages are as follows (Bodie et al, 2005: 89);

a) **Professional management:** Mutual funds are actively managed by professional managers. Experienced fund managers carefully select the securities in which they invest and search the best options to meet the fund's objective. When you invest in mutual funds you do not have to worry about fluctuations on the market. Because fund managers have a considerable amount of experience at buying and selling securities.

b) **Diversification and Severability:** Investors may not have enough money to spread their investments in varied securities, but mutual funds can do this for investors by investing in more than one asset class to spread the risks. This is called diversification and diversification reduces the risk.

c) **Large Scale Investment:** There is a cost to invest. As the investment scale grows, investment costs decrease. Small savings owners also get the advantages of large-scale investors by means of mutual funds (Klapper et al, 2004: 3).

d) **Liquidity:** Mutual funds are very liquid assets because they can be purchased and redeemed shares with relative ease. Therefore, there are high demands on them in capital markets (Chordia, 1996: 4).

e) **Record Keeping and Transparency:** Mutual fund companies work on a very transparent basis and periodically publish activity reports where capital distributions, dividend payments, amortisation, and new investments are reported.

f) **Low transaction costs:** Mutual funds give their investors the advantage of lower trading costs. Since they are traded in big volumes, Mutual funds are less expensive than the typical portfolio of stocks but the investor may only be responsible for one low expense. This expense is the fee for managing the fund.

g) **Flexibility:** Investors can easily change positions in their portfolio according to the conditions of the economy and switch between funds (Investment Company Institute, 2007: 9).

Based on the above descriptions and general evaluations in this context, mutual funds present to investors the following benefits and services.

- Offering a set of investment targets and innovative solutions that meet the investor needs
- Accessing to domestic and foreign investment opportunities, which investors cannot directly reach.
- Allowing investors to respond to the demands in their personal conditions by providing liquidity quickly.
- Accessing to investments for all kinds of investors including those who prefer to invest in small amounts regularly
- Allowing investors to choose full services, different purchasing methods, and different charge levels
- Offering an accountable service to investors through legal arrangements and transparency

1.1.6. Costs of Mutual Funds

Running a mutual fund involves costs and these costs of funds are passed through to investors by imposing fees and expenses. The costs vary substantially across funds and from country to country. These differences are usually derived from the founder and structure of the funds and legal arrangements they operated (Khorana et al, 2008: 1280). However, it is possible to say that there are mainly two major components of costs in mutual funds industry such as sales charges and expense ratios (Bank of Montreal Nesbitt Burns, 2018: 5).

a) **Sales Charges:** When investors buy or sell a mutual fund there are fees that the investor bears. Mutual funds can be called namely load and no-load based on their fees charged as commissions. When it comes to a load mutual fund, mutual funds are acquired with a sales charge and this charge is paid by the investors to the seller. However, when a sales charge is not involved, investors pay no commission to the seller (RBC Global Asset Management Inc., 2016: 3).

b) **Expense Ratios:** Mutual fund's expenses ratio is the sum of a variety of management fees and operating fees. It is usually expressed as a percentage and shows the fund's investment quality. The largest component of a fund's operating expenses is the fee paid to managers. In addition, there are other expenses that mutual funds must pay such as recordkeeping, depositor services, marketing and distribution fees, auditing fees, and etc. It is not possible for mutual funds to be considered without any fees or expenses; but expenses ratio of the funds vary by fund's objectives. All of these expenses are given in detail in each fund' internal regulations and cannot exceed the rates set by the statutory authorities in the countries in which the funds operate. (J.P. Morgan Chase & Co., 2018: 6)

1.1.7. Management Principles of Mutual Funds

The purpose of the principles is to protect the rights of the investors and to obstruct the use of funds to serve the interests of the executive, those who possess for share the domination of either institution and top executives. The person who is in charge of managing the fund portfolio cannot carry out the operations which will

result in favor of one of the mutual funds or clients but to detriment of the others in case of managing more than one fund. The principles to be obeyed in the administration of mutual funds are as follows:

1.1.7.1. Diversification of Risk

Mutual funds are conducted as to the essentials of risk diversification. The distribution of risk is possible when a large number of assets in different structures are taken into the portfolio. Any portfolio which is varied this way allows for the reduction of risk by providing the compensation of losses which arise from some assets with the earnings obtained from some others (Kılıç, 2002: 7-8). Mutual funds, with this principle, might distribute risk, in scale with which individuals will never be able to provide with their own means (Civan, 2007: 50).

1.1.7.2. Professional Management Principle

Securities markets are technical ones that require certain knowledge and expertise in respect of their qualities. It is essential to adopt a particular attitude in time by examining the developments in this market closely and estimating its effects on the prices of securities. Mutual funds provide a saving of time and information to small investors and allow them to participate in the markets without being affected by speculative fluctuations and minimizing risks. Securities markets substantiate this by means of its expert staff (Dilek, 2008: 36). It is an important task to mediate how much weight will be given to which asset groups while forming a portfolio in order to procure the best return with minimum risk. It is also necessary to choose accurately the securities within an asset group to invest in. After the formation of portfolio, it is essential to analyze the influence of every new condition or development in the market on risk level which has been mediated during the formation of portfolio and act immediately according to the current situation, that is to say changing the asset distribution of portfolio from time to time and monitoring of markets and sectors continuously is important.

1.1.7.3. Preservation of Principle

The assets of the fund are separated from those of the founder even if the fund does not have a legal entity. The assets of the fund cannot be pawned, collateralized or levied to third parties. The founder represents, manages or audits the management of the fund in the way to protect the rights of the participation certificate owners who deliver their money to him believingly.

1.1.7.4. Fiduciary Ownership

Investment funds are founded as to the essentials of fiduciary ownership as they do not have legal entities (Akel, 2006: 2). The founder, who is also the believed fund executive, possesses the investment fund. The investors, who are also believers, transfer the property of the fund through the participation certificates which they have taken. This transfer comes true by means of a trust agreement which is called fund directory. The fund executive becomes the owner of fund assets that are formed in return of participation certificates but he has to conduct these fund assets within the limits of the current agreement. The assets which are found in the securities portfolio of an investment fund are those which have been transferred to the management of the founder, who is at the same time the accredited one, by the investors who possess participation certificates. The rights which have been transferred are the distribution of risk, earning profit share and management in the manner of the prudent merchant (Dilek, 2008: 38). The participation certificate owners in an investment fund never join the team of managers and cannot give instructions to the fund executive.

1.1.7.5. Management of Portfolio of Securities

The primary purposes of investment funds are to purchase and sell securities, to create positive values (profit) out of these operations and to earn income out of profit shares and interests of these securities. Mutual funds are organizations that also invest in many assets within some limitations. Mutual funds cannot be engaged in

any kind of activity except managing the portfolio which consists of the assets it has been permitted to invest in (Sermaye Piyasası Kurulu, 2016: 17).

1.2. MUTUAL FUNDS IN TURKEY

As capital movements become globalized, the interaction in international financial markets increases and capital movements increase rapidly. Investors have start investing in foreign stocks to diversify their portfolio and reduce their risk. However, these investments constitute major burdens for developing countries during periods of economic recession and crisis (Yüce, 1997: 5). Turkey is one of the developing countries and carries similar features to implementations in developed countries in terms of mutual funds.

1.2.1. Development of Mutual Funds in Turkey

Mutual funds have become known by Turkish investors since the 1960s. A few experimentations regarding mutual funds have been made in order to solve the problem of inadequacy of savings and success has hardly ever been achieved (Bolat, 2006: 37).

Since mutual funds emerged as an investment tool, they have evolved until today and have become increasingly widespread. The first application of mutual funds in Turkey was started in June 1979. when Securities-Banking and Incorporated Company became an incorporated one in 1975, the concept “creating mutual funds” was first seen on the contract which covered a change dated 15 November 1979. A fund was founded within the body of “Securities-Banking and Finance Incorporated Company” on the same day and was given the name “Meban Mutual Fund”. The fund and its certificates of attendance were introduced into the market in the form of three slices and circulated (Tezcan, 1999: 36). Selling and buying rates of the participation certificates of Meban Mutual Funds have been announced to the public through daily newspapers. The value of the participation certificates of the fund rose quite a lot in the year 1980. Mutual funds have shown development up today and have become widespread by providing portfolio variety since the time it appeared as

an instrument of investment. The legal regulations regarding mutual funds according to Articles 35-44 of the CMLw numbered 2499 and dated 28, July 1981 has formed a statutory base on which securities mutual funds could be founded in Turkey as an auxiliary corporation. After the CMLw numbered 2499 passed in 1981, CMB was founded in 1982 and Stock Exchange Market started to operate in 1986.

Isbank, which is the leader for the foundation of mutual funds, founded the first fund titled “Is Investment” and its certificates of attendance were introduced into the market on 13, July 1987. Since then, until the end of November 1988, 17 securities funds were founded by 10 different banks in Turkey and they started to operate immediately. Is Fund-1 was followed by Garanti Fund-1 which was followed by Esbank Fund-1 in order (Gerek, 2007: 81).

Table 4: The First Investment Funds Established in Turkey

RANK	FOUNDER BANKS	NAME OF FUNDS	PARTICIPATION CERTIFICATE REGISTRATION	FUND VALUE (million)
1	Turkey İş Bank	İş Investment	13.07.1987	10
2	International Industrial and Commercial Bank	Interfund 1	19.09.1987	5
3	International Industrial and Commercial Bank	Interfund 2	14.12.1987	5
4	İktisat Bank	İktisat Investment 1	16.09.1987	5
5	İktisat Bank	İktisat Investment 2	10.02.1987	5
6	Garanti Bank	Garanti Investment 1	22.10.1987	5
7	Eskişehir Bank	Esbank Fund	16.11.1987	5
8	Yapı Kredi Bank	YKB Investment Fund	02.11.1987	10
9	Yapı Kredi Bank	YKB Sector Fund	07.03.1988	7
10	Yapı Kredi Bank	YKB Stock Fund	07.03.1988	1
11	Yapı Kredi Bank	YKB Public Fund	07.03.1988	5
12	Yapı Kredi Bank	YKB Liquid Fund	07.03.1988	10
13	Yapı Kredi Bank	YKB Mixed Fund	07.03.1988	5
14	Dışbank - Turkish Trading Bank	Dışbank Blue Fund	28.06.1988	3
15	T. Tütünçüler Bank	Tütünbank Fund	04.07.1988	5
16	T.Vakıflar Bank	Vakıfbank Fund	09.05.1988	5
17	Chemical Mitsui Bank	Cembank Fund	15.07.1988	2

Source: İktisadi Araştırma Vakfı, 1989: 89.

Mutual funds have been put into practice in Turkey long after the securities market has started to operate. There are three reasons for this (Uzay, 1994: 280-281). The first one is the delay in the foundation of the Borsa İstanbul (BIST). The second reason is that the communiqué on the public offering of participation certificates came into force in 1986. The third reason is tax regulations, which are to be thought of as the most important problem. As the time goes by, the ministry added a temporary article to the income tax law in order to solve the problems related to the

tax regulations. With this temporary article, the gains of mutual funds obtained from portfolio management are exempted from corporate tax. These developments eliminated the problems that prevented banks from establishing funds and later, Turkey's tax system was completely changed over time and the problems were solved (Apak and Demirel, 2009: 260-261).

1997 is a year of significant developments for fund management in Turkey. Oyak, which is the first portfolio management company, was established in July 1997. In addition, the first private investment fund, foreign investment fund, and sector funds were formed in July, August, and December of the same year. The daily fund prices and portfolio allocation data were presented to the public in January 1999 and the first index funds were also presented to the public via the internet in July of the same year (Sancakdar, 2006: 125).

The pension fund arrangements were published in the official gazette in 2002. Following the issuance of the pension funds communiqués in September 2003, the first pension funds were established in October of the same year (Bulut et al, 2015: 180).

The improvements in the economy of Turkey and the world in the course of time as well as the arrangements which have been made, the improvement of the new financial systems and the rising of the demands for them, the occurrence of the crucial developments in the world financial system in the 21st century in terms of greatness and diversity of the capital market instruments, the rising of the foreign capital flow 4.7 trillion dollars in 2000 to 10.9 trillion dollars in 2007, the rise of the assets of the foreign investors in different countries to 96 trillion dollars which is 10 times as much as of the year 1990 (Türkiye Büyük Millet Meclisi (TBMM), 2012: 5) and with the impact of the world financial crisis between the years 2008 and 2009, the obligation for the formation of a consistent governmental arrangement and supervision mechanism as well as the rearrangement of the finance sector in international platforms have occurred (Gündoğdu, 2015: 22). After the global crisis, it has been put forth that there is a need for the foundation of an international audit and surveillance system in the EU, England and the USA regarding their finance systems. It has been forth before that these financial systems are not deep and liquid enough and financial transactions are realized in foreign financial institutions and

markets in developing countries such as Turkey where foreign companies are predominant in the finance sector are of great importance in terms of establishing a buffer against the crisis worldwide (Ergincan and Yayla, 2013: 66-68). Within this framework, both the reforms that have been made in the field of regulation worldwide after the 2008 crisis and the emerging variations in the conditions of Turkey have revealed the need to revolutionize the CMLw. Accordingly, the draft of CMLw was prepared by the Council of Ministers on 2 May 2012 in accordance with (TBMM, 2012: 12-126);

- Current financial improvements,
- The 2008 global financial crisis and its effects in Turkey and the whole world,
- The elimination of the deficiencies in the present law,
- having a strong legal structure and making an innovative adjustment,
- The development of new financial instruments,
- The convenience to the New Turkish Commercial Law numbered 6102 which has gone in effect,
- The reconstruction of capital adequacy regulations aimed at financial institutions with the lessons learned from the crisis,
- taking unarranged financial companies and markets under regulation and supervision,
- Strengthening the regulations directed towards healthy functioning of financial institutions,

As well as similar needs and this law has been accepted after having been published in the official gazette. Some regulations are desuetude; some are updated whereas some others are made for the first time by the acceptance of the new CMLw. Some changes have occurred in the mutual funds that form the main theme in this study. The basic and crucial changes that have been made are as follows:

Together with the discharge of capital market instruments, innovations and changes made in the essentials related issuers and public disclosure, the system of board recording of capital market instruments which is situated in the Law, numbered 2499 has been desuetude and the application system of adoption of the registration statements by the council in the form which is parallel to EU Acquis

have been put into regulation instead (Dayan, 2014: 265). Nevertheless, it has been mentioned that the approval of the registration statement does not mean that the accuracy of the information in the registration statement has been guaranteed by the council or it can be accepted as an advice regarding capital market instruments in question (article 4/1, 6/1) and the concept of the registration statement validity period has been designated as 12 months after its first arrangement. Thus, facilitating discharges has been aimed at reducing approval, registration, announcement and other additional costs before each removal. Besides, the right to withdraw their demands within two days has been given to investors in case of the occurrence of a change in the registration statement (Berber, 2013: 65).

It has been expressed, with the title of 'People Responsible for the Registration Statement' in article 10 of the new Law in which issuers will be responsible for any losses caused by wrong, deceptive or missing information in the registration statement. In addition, the issuers to the public, the leader intermediary firms that mediate issuance, guarantor (if there is one), and the board members of the issuer have been found responsible at the rate of their faults and according to the requirements of the current condition in case. In this regard, it is clear that the loss is impossible to reimburse from the people in question.

Banks and intermediary institutions have been disempowered to set up and conduct mutual funds through the new law and banks are defined as investment enterprises while they were being specified as a financial intermediary in the old law. Together with this new regulation, the portfolio managing company, the major activity of which is to set up and manage mutual funds, has been authorized to establish and conduct mutual funds in parallel with UCITS instructions toward the purpose of managing mutual funds and therefore making the fund sector have a more competitive structure. In this direction, the warrants and responsibilities which have been arranged with relation to fund founder in the law numbered 2499 have been rearranged for the portfolio management company. Also portfolio management company, as expressed by law, has been defined as the authorized organization which represents the fund by fully protecting the rights of the owners of the mutual funds participation shares, which manages or audits the administration, which has the

right to make savings upon the assets of the fund on behalf of either itself or the fund in accordance with the fund internal regulations and legislation (Dayan, 2014: 256).

Together with the new CMLw, “Principles of Public Disclosure (PPD)” which are found only under the title ‘special cases’ beforehand, have been dealt separately in the law. In addition, the concepts of conformity to accountancy and independent audit standards as well as informing the public are also included in the law. PPD have been made more harder and responsibilities have assigned (Gündoğdu, 2015: 26). Accordingly, it has been expressed in article 14 of the law that the issuer will be announced to the public and the financial tables and reports to be asked for by the assembly will be prepared in accordance with “Turkish Accounting Standards” and regulations mediated by the assembly. It has also been stressed that reports have to be prepared accurately and completely in time. Issuer and board members (according to their faults or the requirements of the condition) will be responsible for the preparation of the financial tables and their authenticity. In addition, issuers have to take an independent audit report, which has been issued by an independent auditing institution, after the examination aiming at the convenience of the information in the report within the limits of auditing standards. Preparation of financial tables within this framework giving the CMB full authority to ask for special auditing in transactions that have priority or in cases with a special condition have also been important innovations (Berber, 2013: 64).

The foundation of mutual funds as umbrella funds and the construction of funds as sub-funds connected to umbrella funds are compulsory through the new CMLw, which was enforced 1 July 2014 and CPIF with the number of III-52.1. Within this content, the current mutual funds that provide some certain conditions were given time until the first of July 2015 for the orientation to the new arrangement (Sermaye Piyasası Kurulu, 2014: 61). It is provided that mutual funds respond to the needs of different investor profiles by allowing the redemption and issuance the shares of investment funds in foreign exchange the daily purchasing & selling rates of which are announced by the Central Bank of the Republic of Turkey (CBRT) (TBMM, 2012: 78). Besides, a transition has been made from the semi open-ended fund structure which mediates the maximum circulation number of the fund participation shares in the current regulation to full open-ended fund structure in

which there is no circulation limit. Moreover, receiving of the notary approval for fund internal regulations was given up and thus, an important expense for fund founders has been abolished (Sermaye Piyasası Kurulu, 2012: 87).

According to Turkish Capital Markets (TCM) General Outlook Report (June, 2019) prepared by the TSPB, at the end of 2018, the mutual funds sector, which has become one of the sub-sector of the financial sector, has almost reached up to 53 billion Turkish Lira and the number of investors who invest in mutual funds has reached up to 3,3 million through the supportive effect of new laws and communiqués. Table 5 depicts the transaction volume and number of transactions of mutual funds in Turkey by years. It is seen that the transaction volumes increased by years but, there is a decrease in dollar terms due to the rise in the exchange rate in 2014. When we look at the number of transactions between the years of 2008 and 2018, the number of transactions has increased almost 6 times. The total transaction volume with the number of transactions has also increased proportionally.

Table 5: Trading Volume and Number of Transactions of Mutual Funds in Turkey

Years	Number of Working Days	Trading Volume			Number of Transactions	
		Total (TL)	Total (USD)	Daily Average (TL)	Total	Daily Average
2018	251	856,132,798,000	181,873.84	3,410,887,641	249,245	993
2017	253	608,950,739,000	167,304.37	2,406,919,917	215,835	853
2016	251	427,968,086,000	141,362.05	1,705,052,135	200,449	799
2015	253	257,237,132,000	94,374.03	1,016,747,557	147,843	584
2014	251	234,763,661,000	107,475.10	935,313,390	139,391	555
2013	250	233,997,197,000	122,787.13	935,988,788	140,396	562
2012	253	180,776,290,000	100,908.65	714,530,791	132,741	525
2011	253	96,995,915,000	57,477.50	383,383,063	81,535	322
2010	250	48,272,494,000	32,198.02	193,089,976	36,533	146
2009	252	38,467,703,000	25,085.38	152,649,615	37,208	148
2008	251	38,059,003,000	29,622.91	151,629,494	42,474	169

Source: Takasbank Para Piyasası İşlem Adetleri Raporu [https:// www.takasbank.com.tr/tr/istatistikler/takasbank-para-piyasasi-tpp/tpp-islem-ortalamalari-raporu](https://www.takasbank.com.tr/tr/istatistikler/takasbank-para-piyasasi-tpp/tpp-islem-ortalamalari-raporu), (31.12.2018)

The increase in the number of funds in Turkey is due to portfolio structure not only names. The structure and development of mutual funds in Turkey shows

similarities with the world. Funds are collected in exchange for participation certificate and these funds are kept in the Takasbank, which is based on BIST (Apak and Demirel, 2009: 260-261).

There are 489 active securities mutual funds and 408 active pension mutual funds in Turkey by the end of November 2018. In terms of the total number of funds, securities mutual funds constitute approximately 55% of the total. Sector size of about 34 % of the market size of about 138 million TL in Turkey. The number and total NAVs of mutual funds located in Turkey between 2015-2018/11 years are given in Table 6.

Table 6: Number of Mutual Funds and Investors, and NAV of Mutual Funds in Turkey between 2015 and 2018/11

Years	2015	2016	2017	2018/11
Number of Funds				
Securities Mutual Funds	363	384	456	489
Pension Mutual Funds	249	263	299	408
Total	612	647	755	897
Number of Investors				
Securities Mutual Funds	3,264,495	3,089,530	3,064,461	3,227,920
Pension Mutual Funds	6,004,152	6,625,759	6,922,615	6,883,738
Total	9,268,647	9,715,289	9,987,076	10,111,658
NAV (Millions TL)				
Securities Mutual Funds	37,186	43,755	54,208	46,806
Pension Mutual Funds	47,918	58,439	79,531	91,110
Total	85,105	102,195	133,739	137,917

Source: CMB, Monthly Statistical Bulletin, December 2018

The corporate bonds are in the first place among instruments in which mutual funds are invested in Turkey. Corporate bonds are fixed return securities. The risk of non-repayment of these bonds is higher as against government bonds and thus, they provide higher returns. The instruments that mutual funds prefer to invest in are presented in Table 7.

Table 7: The Instruments that all Mutual Funds in Turkey Invest and The Distribution of These Instruments in Total Assets

Year	S (%)	PDI (%)	RR (%)	MM (%)	FS (%)	CB (%)	DA (%)	Others (%)
2015	4.94	13.38	16.89	5.24	3.87	47.98	-	7.70
2016	5.72	10.52	4.31	14.34	6.34	49.87	-	8.90
2017	8.24	5.94	2.92	17.27	12.04	43.59	8.42	1.58
2018/11	9.09	8.14	5.86	15.35	17.36	37.15	5.05	2.00
S %: Proportion of Stock in the portfolio. PDI %: Proportion of Public Debt Instruments in the portfolio RR %: Proportion of Reverse Repo in the portfolio MM %: Proportion of Money Market Instruments in the portfolio FS %: Proportion of Foreign Securities in the portfolio CB %: Proportion of Corporate Bonds in the portfolio. DA %: Proportion of Deposit Accounts in the portfolio.								

Source: CMB, Monthly Statistical Bulletin, December 2018

Inevitably, the kind of fund, which has the highest total NAV, is debt instruments because these instruments are the most preferred to invest in by mutual funds. Debt Instrument Funds of the total NAV of investment funds in Turkey has the largest share while creating 50% of the total. This is followed by money market funds, hedge funds, and variable funds respectively. The share mutual funds which constitute the data set of this study have a share of approximately 5% in the total. Table 8 depicts the total NAVs of mutual funds according to the types traded in Turkey.

Table 8: Total NAV of Mutual Funds according to Fund Types (Million TL)

Years	2011	2012	2013	2014	2015	2016	2017
Debt Instruments Funds	1,269	6,849	13,774	15,838	18,874	22,716	22,923
Money Markets Funds	20,555	17,036	11,005	12,622	11,961	12,635	13,875
Variable Funds	1,548	2,587	2,763	3,840	3,368	3,221	5,219
Hedge Funds	162	244	580	935	2,138	3,174	5,894
Share Funds	652	374	820	769	1,371	1,394	2,230
Mixed Funds	356	419	53	468	418	451	552
Gold and Precious Funds	1,346	839	515	367	221	321	410
Funds of Funds	20	14	24	49	160	379	1,538
Protected Funds	2,846	923	460	162	158	282	244
Exchange Traded Funds	287	626	181	193	125	139	152
Participation Funds	1	1	5	13	95	158	573
Foreign Securities Funds	101	101	132	151	7	-	-
Private Funds	384	465	467	690	1	-	-
Guaranteed Funds	772	77	411	22	-	-	-
Total	30,300	30,554	31,191	36,119	38,887	44,870	44,870

Source: TCMs Report, 2017: 32

1.2.2. General Structure and Operations of Mutual Funds Industry in Turkey

The regulator of capital markets in Turkey is the CMB. Mutual funds in Turkey operate in accordance with the CMLw dated 06.12.2012 and numbered 6362 and CPIF with number of III-52.1 dated 09.07.2013 and numbered 28702 issued on the basis of the relevant articles of Law. However, the related communiqué does not include exchange-traded funds, real estate investment funds and venture capital investment funds. Since mutual funds emerged as an investment tool, they have evolved until today and have become increasingly widespread. CMLw in force enables funds as investment companies with fixed capital and investment companies with variable capital and contractual open-ended funds. However, mutual funds are mainly invested in Turkey have the structure of the open-end.

All the mutual funds in Turkey are formed in the structure, which comprises of four separate participants, namely, sponsor, portfolio management company, custodian, and investor. (Kılıç, 2002: 6).

Mutual funds can be founded only by portfolio management companies that are licensed by CMB. The main activity of these companies is to establish and manage investment funds (CMLw numbered 6362, Article:55). The portfolio management company is responsible for operating and distributing the fund and for appointing a custodian. Takasbank, the depositary, and clearing and settlement institution to BIST, is the custodian to all funds.

While the mutual funds do not have a legal personality, the funds are managed on the basis of fiduciary ownership which is accepted as a valid legal instrument by doctrines and convictions. Fiduciary ownership has been adopted by CMLw. Therefore, the assets of the fund are separate from the assets of the fund's founder. Investors transfer their savings to the fund by buying participation certificate and at the same time fund managers also manage the fund according to the provisions of the fund's internal regulations. This is the basis of the principle of fiduciary ownership (Özeroğlu, 2014: 399-400). In addition, the fund manager is separate from the founder of the fund. The reason for this is ensuring that mutual funds are managed in accordance with the interests of the investor, not on behalf of the founder.

On the other hand, the units of all mutual funds operating in Turkey are being traded through an electronic trading platform called the "Turkey Electronic Fund Distribution Platform" (TEFAS) which was established with the authorization of CMB and is operated by Takasbank. All banks, intermediary institutions, and portfolio management companies are members of this platform. It provides investors with access to all funds through a single investment account.

1.2.3. Classification of Mutual Funds

Mutual funds in Turkey have to be founded under the roof of the umbrella fund according to the CPIF in force. According to the definition of the CMB, an umbrella fund is an investment fund covering all funds issued under single internal regulations. Basically, those who desire to establish funds are responsible to organize an umbrella fund which they may collect under it and which has a roof function. Although the umbrella funds do not have the assets (property), they are used for

grouping mutual funds with different characteristics under their roofs. (Shares umbrella funds, debt instruments umbrella funds, etc.) In cases where the umbrella funds are liquidated or handed over for various reasons, it is necessary to liquidate or transfer the funds that are in line with these funds. CMB differentiates the umbrella mutual funds due to the risk variations. According to article 6 in “Communiqué regarding fundamentals of mutual funds”, mutual funds are listed as below;

a) Funds which continuously invest at least 80% of the fund’s total portfolio in;

1. Invested on domestic or foreign public and/or private debt instruments which are within the content of umbrella funds named as “Debt Instruments Umbrella Fund”,

2. Invested on the shares of domestic or/and foreign issuers which are within the content of umbrella funds known as “Share Umbrella Fund”,

3. Invested on gold or other precious metals which are traded in exchanges and other capital market instruments based on precious metals which are within the content of umbrella funds called “Precious Metals Umbrella Fund”,

4. Include funds composed of participation shares of other funds and exchange traded funds which are umbrella funds named as “Fund’s of Funds”,

b) Umbrella funds named as “Money Market Umbrella Fund “ which include funds the portfolio’s weighted average due rate of which is calculated daily and is maximum 45 days and the whole portfolio of which is constantly composed of money and capital market instruments with high liquidity and maximum 184 days of fall due,

c) Umbrella funds known as “Participation Umbrella Fund” which include funds the whole portfolio of which is constantly composed of lease certificates, participation accounts, corporate shares, gold and other precious metals and money and capital market instruments which are not based on other interest which is deemed appropriate by the board

d) Umbrella funds named as “Variable Umbrella Fund” which include funds which do not belong to any of above types in respect of portfolio limitations

e) Umbrella funds called as “Hedge Umbrella Fund” which include funds which have been founded to sell its participation shares to only qualified investors,

f) Repayment of a certain part of the whole or a certain amount above the investor's initial investment in certain terms within the limits of the essentials determined in information documents;

1. Umbrella funds named as "Guaranteed Umbrella Fund" which include funds which have been pledged relying on a convenient investment strategy and the guarantee granted by the guarantor,

2. The umbrella funds which include funds that are aimed within the limits of the best effort principle by relying on a suitable investment strategy are called as "Protected Umbrella Fund".

1.2.4. Taxation of Mutual Funds

The tax regulations of mutual funds are determined by the authorized public institutions and taxation plays a crucial role in the competitiveness of the mutual fund sector. Investors are not willing to pay tax which they do not have to pay. If tax regulations are not attractive for investors, they usually seek other financial instruments where tax regulations are more attractive. Therefore, professional fund managers try to minimize tax liability and maximize returns to attract investors. Taxation authorities in Turkey are the Ministry of Finance and tax offices. The taxation of mutual funds can be varied according to whether the taxpayer is an institution or individual. Matters related to taxation are addressed in the relevant articles of the Income Tax Law (ITL) numbered 193 and Corporate Tax Law numbered 5520.

a) **Taxation According to Portfolio Management Earnings:** The earnings which stem from the portfolio management of security investment funds are free of corporate tax as required by the (d) sub-weir numbered 1 of article 5 of Corporate Tax Law (CTL) numbered 5520 in terms of corporate tax regulations. On the other hand, in terms of income tax regulations, the earnings of fund portfolio management are subject to income tax withholding at the rate of 0 % in accordance with weir 8 of temporary article 67 of Income Tax Law (ITL).

b) **Taxation According to Participants:** The total income gained from all mutual funds for individual investors are subject to a 10 % stoppage, whereas it is 0

% to share mutual funds. On the other hand, the total income which is gained from participation certificates of all mutual funds for the portfolio management company is taxed at 0 %.

1.2.5. Audit in Mutual Funds

All accounts and transactions related to the fund of founders, managers, and depositors of mutual funds are under the control of the CMB. The founder of the mutual funds is obligated to appoint minimum one auditor with certain qualifications for each fund. Besides, mutual funds are inspected by independent external auditing companies once in 6 months or once in a year through an agreement issued. Annual inspection reports have to be sent to the CMB. The Board has the right to inspect mutual funds at any time (CMLw, article 35 and 36).

1.2.6. Resources That Provide Information About Mutual Funds

It is of great importance to obtain information about funds and to examine the structures, strategies, compositions and performances of the funds before investing in any investment fund. Accordingly, making an investment decision will be healthier by taking personal preferences and risk perception into consideration. Some basic sources of information can be listed as follows (Sermaye Piyasası Kurulu, 2016: 13-16);

1.2.6.1. Basic Information Resources

Another important issue is the resources from which information regarding mutual funds can be taken at the stage of investing in mutual funds. The investors can obtain the required info from the following documents after and at the moment of a public offering of the participation certificates of mutual funds.

1.2.6.2. Prospectus

It is the fund sale document which is prepared during the public offering of the participation certificates and it includes information about the fund. The registration statement covers info such as the founder of the fund, the address of the founder and the fund, places where the participation certificates of the fund can be purchased or sold, who the fund executives are and their experience in the field of the capital market, the fund's strategy of investment, investment limitations, the fund's spending, the portfolio structure and related tax arrangements. Registration statements are announced in Public Disclosure Platform (PDP) and the official website of the founder.

1.2.6.3. Investor Information Forms

Investor information forms, like registration statement, are prepared during public offering of the certificates of participation and they include basic information about the fund such as the founder of the fund, the address of the founder and the fund, places where the certificates of participation of the fund can be purchased or sold, the portfolio structure, etc. These information forms are announced in PDP and the official website of the founder; but also will not be announced in The Turkish Trade Registry Gazette and not be registered in the commercial register.

1.2.6.4. Internal Regulations

Internal regulations of the fund is an adhesion contract which includes general principals of operation, the preservation of the fund portfolio according to the principals of fiduciary ownership and portfolio management according to the terms of attorney agreement valid between the parties the founder, the owners of participation certificates and between the preserver and the manager.

1.2.6.5. Asset Allocation Reports

Asset allocation reports include information about the past performance of the fund and the movements of securities & certificates of participation within the month. These reports are announced to the public through PDP within six days following each month.

1.2.6.6. Daily Newspapers and Periodicals

The prices of the certificates of participation of mutual funds are announced regularly in many daily newspapers. It is possible to find the comparative seasonal incomes of mutual funds in periodic financial magazines. In addition, newspapers and magazines publish news such as funds launched or their certificates of participation are subject to public offering and info about fund portfolio managers. It is possible to find detailed information about the portfolio structure of all mutual funds on a recent monthly basis and portfolio distribution on a monthly basis in the monthly bulletin of the board.

1.2.6.7. The Financial Statements of the Fund

The annual financial statements (issued in comparison with the previous year) and income statements of the mutual funds, fund portfolio value statement, fund total value statement and reports of the independent auditors related to these statements are announced in PDP.

CHAPTER TWO

PERFORMANCE MEASUREMENT MODELS

The last stage of investment is the evaluation of performance. Performance measurement is important for both fund type and fund manager (Alexander and Sharpe, 1989: 369). In this chapter, first, the performance evaluation and its purposes, risk, return and performance concepts are explained and later on, performance measurement methods are examined. Finally, the studies conducted on performance evaluation of mutual funds in international literature and Turkey are examined.

2.1. THE PURPOSES AND EVALUATION OF PORTFOLIO PERFORMANCE

The evaluation of the results obtained after the decisions made in every subject are put into practice and the review of the investment decision through a feedback mechanism has a great importance and this whole period is called performance evaluation (Karacabey, 1999: 89). This is the stage which draws the attention of the saving owners who will mostly invest in mutual funds because the return which they will gain in the future depends on this evaluation. The evaluation which is done after the investment will make the investors see whether they have achieved the expected return from the investment or not (Ban and Ercan, 2005: 177).

There are two approaches in use for the performance evaluation of the mutual funds. The first approach is to compare the risk-adjusted returns of mutual funds with the calculated returns using the same methods of other funds that have similar purposes or the return of an indicator portfolio that represents those funds in the best way. For this comparison, while mutual funds are being graded among themselves according to their performance results at one side, the performance condition of each fund is being determined according to the index portfolio on the other side. The second approach is the determination of whether the financial securities that are in the portfolio of the mutual funds are sold and purchased at the right time. This

approach that is also called as “Market Timing” shows the ability of the fund managers to predict the direction of the market (Kılıç, 2002: 39).

The general purposes of the evaluation of the performance of the mutual funds are as follows (Seremet, 2002: 65);

- Mutual fund managers claim that the portfolio they are managing provides more income than a portfolio that is not managed. In order to affirm this claim it is essential to determine the performances of the portfolio that are managed and to compare these performance results with those of the portfolios which are not managed. The first purpose of the performance evaluation is to realize this comparison.
- The second purpose of the evaluation of the funds is to compare the portfolios, which are managed with each other. The investors may, then, be able to choose the mutual fund that has the best portfolio.
- The third purpose of the evaluation of the investment funds is internal auditing. The success rate of the mutual fund managers is determined in this way. If success is not found sufficient, its reasons are searched and required corrections are made.

Mutual funds, which form the subject of this study, aim maximum return by minimizing the investment risk through the portfolio management which they have formed by covering the stages of determination of the investment policy, securities analysis and selection of the portfolio. How successful the mutual funds are in reaching this aim is crucial both for individual and institutional investors.

The management of a portfolio includes activities of purchasing securities (such as stocks, bonds, etc.) for the portfolio, selling the securities in the portfolio and collecting the incomes of these securities (such as interest and dividend) within the limits mediated by legislation and internal regulations. Activities such as all kinds of researches and analysis, which are based upon the decisions of purchasing and selling of the securities, are also within the context of portfolio management. The securities investment process is composed of five basic stages as determination of the investment policy, analyzing the securities, construction of the portfolio, revising the portfolio, and evaluation of the portfolio performance (Alexander and Sharpe, 1989: 369).

The portfolio management starts with the determination of the risk, which will be undertaken with the investment, and the expected return of the investment. During the second stage, which is called as securities analysis, the financial instruments that will be in the portfolio and their weights within the portfolio are determined by using basic and technical analysis methods. This means converting the individual guesses on securities performance to estimation related to portfolio performance and choosing the effective portfolio among the possible ones, which are too many in number (Kerzner, 1990: 185). The determination of the success of the investment period by evaluating the results obtained at the end of these stages can only come true with the measurement and the evaluation of the portfolio performance (Fabozzi, 2001: 675). During the period of performance evaluation, the risk levels of the mutual funds are of great importance in the evaluation of the performance of the fund management and comparing it with alternative funds. Therefore, the funds must have the same risk level or if they are in a different risk group, their returns must be adjusted to the risk level. Not only the returns of the funds but also the risks that are undertaken should be taken into consideration in the measurement of the performance of the fund management and the evaluation should be made with the returns adjusted to the risk level (Fischer, 1987: 559).

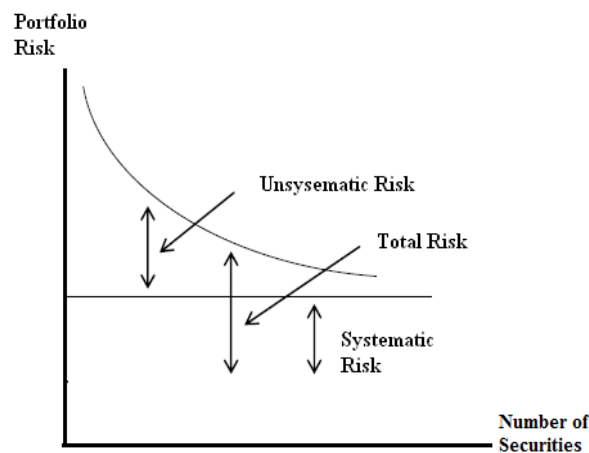
The high return provided by the mutual funds can be either a result of the high risk that has been undertaken or a result of the success of the fund managers. The returns should be adjusted to the risk for more realistic results and so, the determination of the portfolio efficiency must be based upon an analysis of the content of which is much wider than the calculation of the average return. Besides, the performance of the mutual fund must be measured by taking the average return of investment and risk into consideration together and it is crucial to select the convenient risk criteria in performance evaluation (Beyazoğlu, 2002: 13).

In this context, it is primarily useful to explain the concepts of risk and return in terms of portfolio management and performance evaluation.

2.2. RISK CONCEPT

Risk forms the basis of investment decisions. The investors should not ignore the risk they will undertake while they are turning towards investment. The maximum rate of return and the minimum rate of risk are desired in an optimum investment. When viewed from this angle, the risk is the state of realization of the possibilities that belong to return or risk is the objective measure of uncertainty (Ban and Ercan, 2005: 177). The attitudes of the investors in accepting risk might be different from each other. Therefore, the attitudes of investors against risk may be classified into three groups. They are; risk-averse investors who avoid risk, risk-neutral investors who are in different risk and risk lover investors who choose to take the high risk (Bodie et al, 2005: 170). Systematic risk is the risk component that cannot be eliminated by diversification. Unsystematic risk is a risk component that is specific to the entity itself and can be lessened by diversification because this risk type is related to the part of the return of a security that is free from the returns of other securities. The importance of the unsystematic risk in a portfolio, which includes too many securities in number, decreases and so the risk of a well-diversified portfolio stems from the systematic risk of the securities in the portfolio on a big scale (Neale and Pike, 2003: 336). It is possible to demonstrate the change that occurs in the portfolio risk because of diversification as in Figure 4.

Figure 4: Relationship between Diversification and Risk



Source: Neale and Pike, 2003: 335.

As shown in Figure 4, which illustrates the relationship between diversification and risk, the total risk of the portfolio decreases as long as the number of securities in the portfolio rises. However, this decrease in the total risk stems from the decreases in non-systematic risk by the help of diversification. It is not possible to reduce the systematic risk, which is indicated by a line parallel to the horizontal axis, through diversification because it is the source of risk, which affects the prices of all the securities in the market and it is out of the control of the investors (Bodie et al, 2005: 325).

The demonstration of the total risk of a portfolio, which is composed of its systematic and unsystematic risks, through a formula, is as follows (Alexander and Sharpe, 1989: 180):

Total Risk = Systematic Risk + Unsystematic Risk

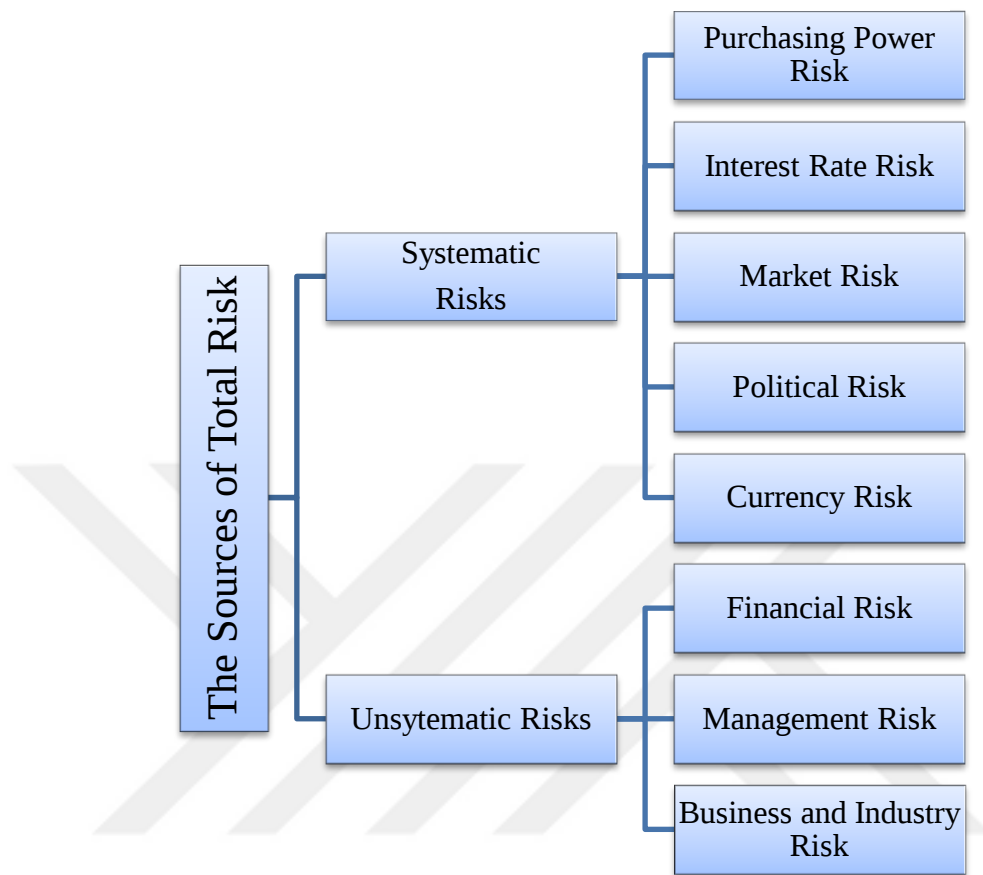
$$\sigma^2(r_p) = \beta_p^2 \sigma^2(r_m) + \sigma^2(e_p)$$

where; $\sigma^2(r_p)$ denotes Total Risk, $\beta_p^2 \sigma^2(r_m)$ is Systematic Risk, β_p is the sensitivity of the portfolio return to the market, $\sigma^2(r_m)$ is the variance of the market return, and $\sigma^2(e_p)$ is Unsystematic Risk.

Systematic and unsystematic risk components also include various risks within themselves. It is possible to demonstrate the total risk sources, which are composed of systematic and unsystematic risks, as in Figure 5.

Figure 5: The Sources of Total Risk

Source:



Hearth and Zaima, 1995: 419.

2.3. RETURN AND PERFORMANCE CONCEPTS

There are two types of returns that securities can provide to investors. The first is the capital gain which derived from the positive change in the market price of the securities, and the second is the dividend for the stock and interest gain for the fixed income securities (Gitman and Zutter, 2012: 311). In the case of investment decisions relating to securities, preference should be made between return and risk. Investing in securities with high return and low risk is the right decision. However, the risks of securities with high returns are also high (Block and Hirt, 2003: 12). The risk is usually expressed by the standard deviation of the return on the investment. The expected return on investment is the weighted average of past returns (Van Horne and Wachowicz, 1992: 69).

The expected return on a security is the sum of the weighted average of the returns in a given period of time. The expected return on single security can be calculated using the formula below;

$$E(R) = \sum_{x=1}^n P_x \cdot R_x$$

Where $E(R)$ denotes the expected return, P_x the probability of x th outcome, and R_x is the rate of return of x th outcome and n is the number of possible outcomes. However, since investing in single security is risky, investors diversify the portfolio by creating different securities in order to distribute the risk (Farrell, 1983: 37).

The expected return on a portfolio is the weighted average of returns on the securities in the portfolio. The expected return of the portfolio can be calculated using the formula below.

$$E(R_a) = \sum_{x=1}^n w_x \cdot E(R_x)$$

Where $E(R_a)$ denotes the expected return of portfolio a , w_x is the weight of the security x in the portfolio, $E(R_x)$ is the expected return of security x in the portfolio and n is the number of securities in the portfolio. It is necessary to calculate not only the expected return of the investment but also the risk in order to make an investment decision (Block and Hirt, 2003: 590).

Variance (σ^2) or the standard deviation (σ) which is the square root of variance is used mostly in the measurement of risk. Variance is obtained by the sum of multiplication of the associated probabilities to the squared differences of each possible return from the expected return. The variance of the securities can be calculated using the formula below (Van Horne, 2002: 38);

$$\sigma^2 = \sum_{x=1}^n P_x \cdot [R_x - E(R_x)]^2$$

Where (σ^2) denotes the variance, P_x is the probability of, R_x is the rate of return achieved at x th outcome and $E(R_x)$ the expected return of x th outcome and n is the number of possible outcomes.

The variance of a portfolio is not the weighted average of all securities, as in the expected return of the portfolio. Because it is not possible that the returns of

securities to move independently of each other. Therefore, it is necessary to reveal the relationship between the returns of securities in the portfolio in order to calculate the variance of the portfolio. Accordingly, the variance of a portfolio, which has two securities, can be calculated with the help of the following formula (Farrell and Reinhart, 1997: 22);

$$\sigma_a^2 = \sum_{x=1}^n \sum_{y=1}^n w_x \cdot w_y \cdot Cov (R_x, R_y)$$

Where (σ_a^2) denotes the variance of portfolio a, (w) is the weight of each securities in the portfolio, $Cov (R_x, R_y)$ is the covariance of the securities.

The covariance shows the direction of the changes in two securities' returns in over time. Since the size and smallness of the covariance do not have a meaning, it takes a value between $-\infty$ and $+\infty$. The sign of covariance indicates the direction of the movements of the two securities' returns. Accordingly, the covariance of the returns of two securities can be calculated with the help of the following formula (Neale and Pike, 2003: 314);

$$Cov (x, y) = \sum_{i=1}^n \left[P_i * (R_{xi} - E(R_x)) * (R_{yi} - E(R_y)) \right]$$

Where $Cov (x, y)$ denotes the covariance of the two securities, R_{xi} is the rate of return on security x achieved at i th outcome, R_{yi} is the rate of return on security y achieved at i th outcome, $E (R_x)$ is the expected return on security x, $E (R_y)$ the expected return on security y, P_i is a probability of i th outcome, and n is the number of possible outcomes.

Variance and standard deviation indicators show how much each possible return deviates from the expected return. The higher the value of standard deviation or variance, the higher the risk (Block and Hirt, 2003: 588).

2.4. THE PERFORMANCE MEASUREMENT MODELS

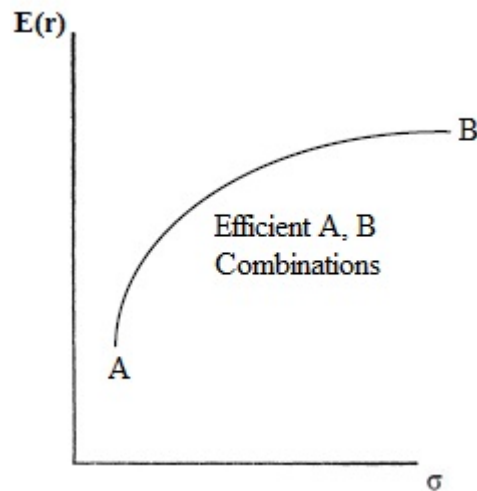
Whether the results of the investments carried out are satisfactory is determined by comparing the investment results with various alternatives. The evaluation of the investment performance is not only important from the point of the investor but also it is essential for the fund managers to determine their own

performance and the performance of the funds, which they manage on the behalf of investors. Portfolio management companies can make use of these standards while evaluating the performances of the fund managers. Investors might use different methods when they wish to measure the performance by comparing investment results. The general performance of the portfolio is determined at the beginning of the period by the value comparison of the difference between the values at the end of the term. The ratio found shows the portfolio return and it is used by comparing with any index or investment instrument but it is convenient only for the short term (Aksoy and Tanrıöven, 2007: 659).

The methods that have been developed towards evaluating mutual fund performance are based on the studies conducted in the 1960s and these methods have gained importance from the point of view of the science of finance by the help of the portfolio theory of Markowitz (1952) and emergence with the CAPM was introduced by Treynor (1962) Sharpe (1964), Lintner (1965), and Mossin (1966) (Simons, 1998: 42).

In the traditional portfolio management, it is thought that the risk factor can be lessened just by increasing the number of securities in the portfolio without considering the relationships among the returns of the securities. This approach has become invalid by the theory developed by Markowitz who is the founder of modern portfolio management. Markowitz, in his modern approach, has put the idea that portfolio risk cannot be decreased only by diversification, the direction and the degree of the relation among the securities in the portfolio have also an impact on the decrease of the risk through "Mean-Variance Model". This model, which has been developed by the Markowitz, is the mathematical figure of the expression "Don't put all the eggs in the same basket!" (Markowitz, 1952: 89). The investors, in the risk-return space, will form their preferences along the AB line, which is dominant on the portfolio possibilities curve in Figure 6 in order to receive the maximum return for a given level of risk or the minimum risk for a given level of return through all combinations of securities. Markowitz (1952: 82) has defined the portfolio on this line as "Efficient Frontier". Efficient Frontier helps the investors to form their portfolio according to their preferences (Block and Hirt, 2003: 594).

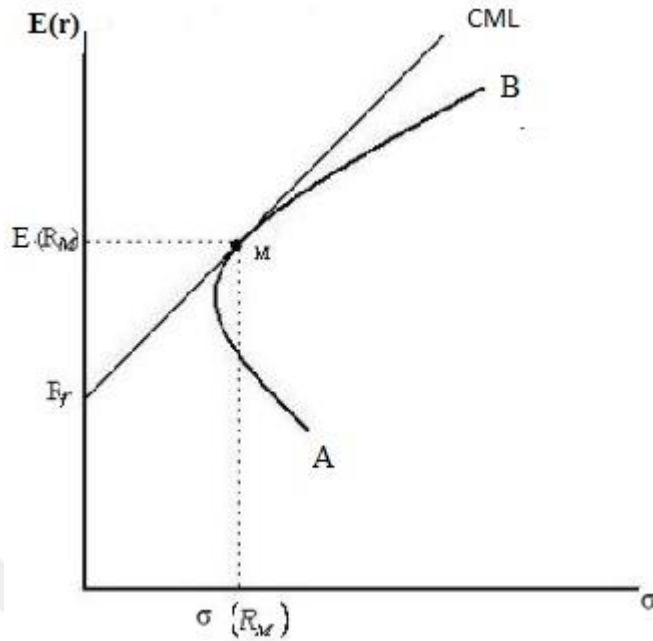
Figure 6: Portfolio Possibilities Curve



Source: Markowitz, 1952: 88.

In Figure 6, the vertical axis denotes the expected return on the portfolio and the horizontal axis shows the standard deviation (risk of portfolio). The securities that will provide a return 100 % without carrying any risks (also called risk-free securities) can be added to the risk-return space. When a risk-return line is drawn which will be tangent to the efficient frontier of the risky securities, all portfolios, which would lie along this line, will be more efficient than the portfolios which exist on the efficient frontier of the risky securities. It is possible to see this in Figure 7. The line that combines the risk-free security and the market portfolio, in other words; the line that is drawn tangent from risk-free rate to the efficient portfolios frontier is called "Capital Market Line" (CML) (Block and Hirt, 2003: 598). The risk-return combination on the M point which is illustrated in Figure 7 belongs to the optimum portfolio which can be made up of risky securities This portfolio is called "Market Portfolio" (Alexander and Sharpe, 1989: 169). The result which the CML ensures that is the standard deviation is the convenient risk measure for efficient portfolio and the expected return in case of investing in an efficient portfolio is directly proportional to the standard deviation of the portfolio (Block and Hirt, 2003: 600).

Figure 7: Capital Market Line



Source: Block and Hirt, 2003: 600.

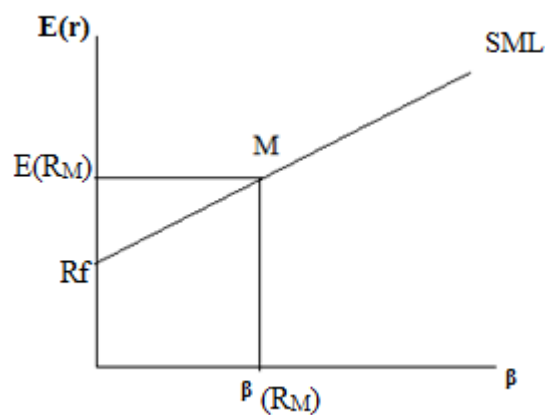
In Figure 7 which is based on Figure 6 which illustrates an efficient set of portfolios would lie along the AB line, the vertical axis denotes expected return on the portfolio and the horizontal axis shows standard deviation (risk of portfolio). In addition, R_f represents the return available on the risk-free security, $E(R_M)$ is the expected return of market and $\sigma(R_M)$ is the standard deviation of the market.

CML has represented the equilibrium relationship between returns and risks for efficient portfolios, in other words, the return that an efficient portfolio, the risk of which is known, has to provide its investors with (Alexander and Sharpe, 1989: 173). However, the same relation is not valid when the subject matter is an inefficient portfolio and it is essential to look for a new relation for this situation (Jones, 1991: 164). Although all investors desire to form an efficient portfolio, it can not be expected for investors to form an efficient portfolio that is composed of the combination of the just risk-free securities with a market portfolio at various ratios. It can be impossible for the market portfolio to include all present securities in suitable ratios for there are too many investment instruments in countries the capital market of which is highly developed. In addition to this, because the investors desire to

obtain earnings by purchasing low-priced securities whereas selling the high-priced ones when needed, the risk-return comparison should be made by comparing the return that the security should provide according to the risk it bears and the expected return on that security. CAPM is developed in this way for ineffective portfolios (Bolak, 1998: 36). When the market is in equilibrium, CAPM provides the determination of return and risk of a portfolio or security and establishing a relationship among them. CAPM has been developed by being based upon a premise that supports that the rate of return that the investors are expecting from any security is equal to the risk-free interest rate and to the risk-premium in the condition when risk reflects diversification (Alexander and Sharpe, 1989: 171).

Security Market Line (SML), which shows the risk-return relation for inefficient portfolios, is illustrated in Figure 8. While investing in any security, the securities the expected return of which is more than the return, which SML shows, are thought to have priced low. Therefore, these securities are invested in (Jones, 1991: 676).

Figure 8: Security Market Line



Source: Jones, 1991: 678.

In figure 8, the vertical axis denotes expected return on the portfolio and the horizontal axis shows beta (systematic risk of portfolio). In addition, R_f is the return available on the risk-free security, $E(R_M)$ is the expected return of market and $\beta(R_M)$ systematic risk of the market.

Before the 1960s, although the risk was known to be crucial in investment success, portfolio performance has been evaluated as the rate of return on investment. The reason for omitting risk was that the knowledge about how the risk is computed was inadequate. In the course of time, researchers have shifted to the portfolio performance evaluations in which risk can be measured as either beta or standard deviation by the help of the development of the modern portfolio theory and CAPM. However, since there was no performance evaluation model that combines both risks and returns, the performance evaluation models considering these two factors separately were developed (Erzurumlu and Gürsoy, 2001: 44).

The studies conducted on the performance evaluation of funds in the 1970s are based on Efficient Market Theory (EMT) developed by Fama (1970). According to EMT, which describes the behavior of a perfect market, prices of securities in financial markets fully reflect all available information at any given time and in a liquid market (Gitman and Zutter, 2012: 278). The basic hypothesis of these studies that are conducted in the 1970s is that EMT is valid and the evidence to support this theory is based on the research of the ability of the portfolio managers to choose the securities which are evaluated in a wrong way either by chance or consciously (Erzurumlu and Gürsoy, 2001: 45).

There are two approaches to performance evaluation. The first approach consists of comparing the risk-adjusted returns of mutual funds with those of other funds with similar objectives or with the return of a reference portfolio that best represents those funds. The second approach is based on testing whether financial securities in the portfolio are bought and sold at the right time. This approach is called market timing and demonstrates the fund manager's ability to foresee the direction of the market. It is very important to choose the appropriate risk measure in performance evaluation (Ceylan and Korkmaz, 2006: 552).

Accordingly, the performance of mutual funds depends on the relationship between risk and return. The high return provided by the mutual funds may be either a result of the high risk that has been undertaken or a result of the success of the fund managers. If the expected return remains the same, in order to reduce the risk, the portfolio should be diversified and therefore the risk should be distributed (Ural, 2010: 41).

The methods developed to evaluate the mutual fund performance are mainly based on the studies conducted in the 1960s. The models, which measure the selection ability of the fund manager, are called Single Index Models. However, the portfolio performance will not only be affected by the manager's ability to choose the right securities but also by the risk level of the portfolio. The models that measure the selection ability of the portfolio manager as well as the ability to foresee market movements (market timing) are called Multi Index Models or Timing and Selectivity Performance Measures. Single Index Models classes into two categories based on total risk and systematic risk (Brown et al, 2014: 675).

2.4.1. Single Index Models That Based on Total Risk

Single Index Models that are based on total risk are divided into two classes as Sharpe Ratio and M^2 Ratio.

2.4.1.1. Sharpe Ratio

The portfolio performance model which created by Sharpe (1966) called as Sharpe Ratio is based on EMT and CAPM (McLeavey and Solnik, 2004: 639). This ratio gives the slope of all possible effective portfolios between the return of a fund and the risk-free rate and considers both the expected rate of return and diversification together (Dowd, 2000: 210). The total risk of the portfolio is expressed through the standard deviation in this performance measure. Sharpe Ratio expresses the excess return, which is demanded by investors over the risk-free rate compared to the total portfolio risk that is measured by the standard deviation, and adjusts the past performance of the portfolio for the excess risk that the investor bears. Sharpe Ratio is calculated as shown below (Blake, 2000: 564).

$$\frac{r_p - r_f}{\sigma_p} = \frac{\text{risk premium}}{\text{total risk}}$$

where, r_p is average portfolio return, r_f is the risk-free rate of return, and σ_p is standard deviation of portfolio (total risk).

The rate rises as a result of the increase in return or the decrease in the standard deviation whereas the rate falls in case of the decrease in return or the rise of standard deviation. The higher the calculated value the better the portfolio performance. Sharpe Ratio is effective in the determination of especially the performance of the total investment portfolio because it does not consider the correlation between the market portfolio and the portfolio that is being examined (Dowd, 2000: 213).

2.4.1.2. Risk Adjusted Performance Ratio (M^2)

M^2 is another risk-adjusted portfolio performance measure that is closely related to the Sharpe Ratio. Although the Sharpe Ratio is very useful in ranking portfolio performance, it is not easy to interpret the numerical values (Hasan and Samarakoon, 2005: 625). The M^2 performance measure was developed by Modigliani and Modigliani (1997) to find a solution to this shortcoming of Sharpe Ratio. This ratio gives similar results as the Sharpe Ratio in the performance ranking of the portfolios but is more easily understood and interpreted (Modigliani and Modigliani, 1997: 49). M^2 performance ratio considers the total risk as risk measurement just as Sharpe Ratio, but it is easier to interpret the performance of the portfolio returns to the benchmark portfolio (Bodie et al, 2002: 869). Stock exchange returns or sector index returns, in general, are used as the benchmark portfolio.

M^2 measurement is formulated as follows (Scholz and Wilkens, 2005: 59):

$$M^2 = r_f + \left(\frac{r_p - r_f}{\sigma_p} \right) \times \sigma_m$$

where, r_p is the average return on the portfolio, r_f is risk-free return, σ_p is the standard deviation of a portfolio, and σ_m is the standard deviation of benchmark returns. According to the formula above, term in the brackets equals to Sharpe Ratio, hence the formula can also be formulated as shown below:

$$M^2 = r_f + (\text{Sharpe Ratio} \times \sigma_m)$$

In this method, firstly, the risk-free rate is added into the mutual fund portfolio that is managed and the adjusted mutual fund that is obtained in this way is compared to the market. As a result, the standard deviations of the adjusted mutual

fund and the market will be the same. Thus, it will be easier to compare the returns of the two portfolios that have the same standard deviation (the same risk). The greater the M^2 , the higher the performance of the fund (Bodie et al, 2002: 869).

2.4.2. Single Index Models That Based on Systematic Risk.

Single Index Models that are based on systematic risk are divided into five classes as Treynor Ratio, Jensen's Alpha, T2 Measure, Information Ratio and Fama Measure.

2.4.2.1. Treynor Ratio

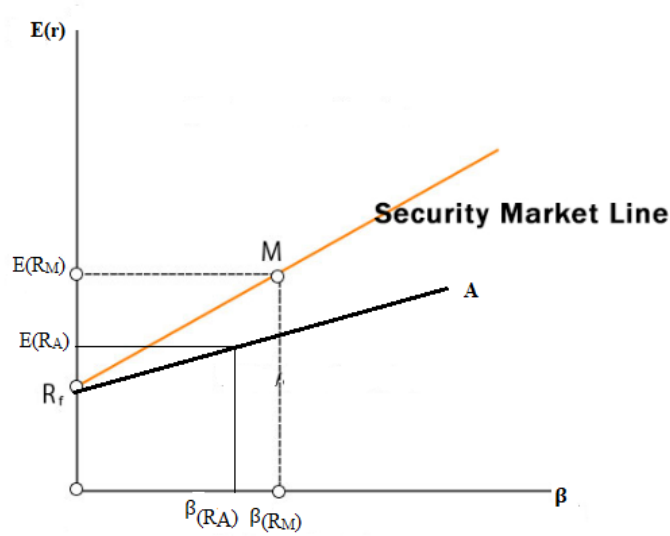
The first risk-adjusted portfolio performance measure was developed by Treynor (1965). The performance measure that Treynor has developed has the same characteristic features as Sharpe Ratio basically. Treynor Ratio is computed by a division of the portfolio return in excess of the risk-free rate per unit of systematic risk rather than total risk. (Levy, 2002: 511). However; while Treynor makes this calculation, he uses the beta coefficient which is the indicator of systematic risk that is the risk of the portfolio which can not be eliminated through diversification (Hasan and Samarakoon, 2005: 619) Beta, which is the slope of portfolio's characteristic line and represents the sensitivity of fund returns to movements of the market portfolio, is the indicator of the variability of portfolio return against the market. Therefore, the higher the slope, the more sensitive the portfolio is to the market. The formula of the Treynor Ratio is as follows (Farrell and Reinhart, 1997: 519):

$$\frac{r_p - r_f}{\beta_p} = \frac{\text{risk premium}}{\text{systematic risk}}$$

where r_p is the average portfolio return, β_p is the portfolio beta (systematic risk), and r_f is the risk-free rate.

Unlike Sharpe Ratio, Treynor explains portfolio performance according to the SML, not CML (Alexander and Sharpe, 1989: 402). Figure 9 illustrates this in below;

Figure 9: Risk-Adjusted Portfolio Return according to Treynor Ratio



Source: Block and Hirt, 2003: 625

where the vertical axis denotes expected return on the portfolio and the horizontal axis shows beta (systematic risk of portfolio). In addition, R_f is the return available on the risk-free security, $E(R_M)$ is the expected return of market and $\beta(R_M)$ is the systematic risk of market, $E(R_A)$ is the expected return of portfolio A and $\beta(R_A)$ is the systematic risk of portfolio A.

If the risk-adjusted return on a portfolio, which is computed according to Treynor Ratio, is located above the SML is interpreted as overvalued or the risk-adjusted return on a portfolio is located below the line is undervalued. Hence, portfolio A in Figure 9 did not beat the market.

2.4.2.2. Jensen's Alpha

An important method used to measure portfolio performance was developed by Jensen (1968) by taking 115 investment funds into the account. The index models of Treynor (1965) and Sharpe (1966) allow a relative performance ranking according to portfolio risks. Jensen (1968), on the other hand, developed an absolute performance measure instead of a relative performance measure by taking risk into consideration (Jarrow et al, 1995: 583) In other words; Jensen (1968) has developed

some standards for portfolio performance. The aim of this method is to compare their actual excess returns with what should be required in the market, based on their portfolio beta (Block and Hirt, 2003: 624).

Jensen's Alpha Ratio is based on the CAPM, which was developed in the mid-1960s and is an important tool in calculating the risk-adjusted return. The model was developed with the help of independent studies proposed by Sharpe (1964), Linther (1965), and Mossin (1966) (Hasan and Samarakoon, 2005: 619). Jensen's Alpha Ratio is formulated as follows (Jensen, 1967: 395):

$$r_p = r_f + \beta_p(r_m - r_f) + e_p$$

Where; r_p is the average return of the portfolio, r_f is risk-free rate, β_p is the portfolio beta (systematic risk), r_m is the average return of the market, and e_p is error term.

This equation consists of the sum of the expected return on any security, risk-free interest rate, systematic risk premium and error term. If the managers have a superior forecasting ability, the portfolio will earn more than the normal risk premium for its level of risk. The existence of a constant term is required for such a forecasting ability to be in the formula. By adding this constant term, called Alpha, to the formula, Jensen's Alpha Ratio is obtained as follows (Jensen, 1967: 396).

$$r_p - r_f = \alpha_i + \beta_p(r_m - r_f) + e_p$$

where r_p is the average return of the portfolio, r_f is risk-free rate, α_i is the constant term, β_p is the portfolio beta (systematic risk), r_m is the average return of the market, and e_p is error term.

According to Jensen (1967: 396), the α_i in the model tests the ability of portfolio managers. If $\alpha_i > 0$, it suggests that there is an excess return for its level of risk and indicates the superior success of portfolio management. Because the portfolio has outperformed those that are not managed professionally. If α_i equals to zero, it is thought that portfolio management is as successful as those which are not managed professionally. Finally, if $\alpha_i < 0$, it is interpreted that there is an unsuccessful portfolio management or the portfolio manager fails to beat the market with his stock picking skills.

2.4.2.3. T^2 Measure

Another performance measure, which makes risk adjustment by adding risk-free securities to the portfolio, is called T^2 and T^2 which is a deviant of Treynor Ratio converts the Treynor Ratio into the percentage return and makes it easier to interpret and compare (Hasan and Samarakoon, 2005: 621; Yücel, 2016: 152).

$$T^2 = R_i^* - R_m$$

R_i^* : Adjusted return of portfolio i

R_m : Market return (benchmark)

The return of the fund that has been adjusted to the market is calculated as follows (Bodie et al, 2004: 689).

$$R_i^* = \left[R_i \frac{\beta_m}{\beta_i} + \left[1 - \frac{\beta_m}{\beta_i} \right] R_f \right]$$

If R_i^* is placed into the formula above, the formula becomes:

$$T^2 = \left[R_i \frac{\beta_m}{\beta_i} + \left[1 - \frac{\beta_m}{\beta_i} \right] R_f \right] - R_m = \left[\frac{R_i - R_f}{\beta_i} \right] \beta_m - (R_m - R_f)$$

Since $\beta_m = 1$, final version of formula is as given:

$$T^2 = \text{Treynor ratio} - (R_m - R_f)$$

where β_m represents market beta value and β_i is portfolio beta value, and R_f is risk-free rate. Among the alternatives, the higher the T^2 performance measure is preferred.

2.4.2.4. Information Ratio (Appraisal Ratio)

Treynor Ratio and Jensen's Alpha measure the performance by taking the only systematic risk of funds into the account; hence, they both omit non-systematic risk (specific risk). Information Ratio makes this adjustment by dividing the fund's alpha to the non-systematic risk of the fund as shown in the following formula. (Bodie et al, 2005: 868):

$$\text{Information Ratio} = \frac{\alpha_p}{\sigma_s}$$

Where, α_p expresses the Jensen Alpha of the fund, σ_s expresses the non-systematic risk of the fund.

The higher the ratio calculated in the formula, the higher the fund performance will be accepted. Information ratio, as exactly in Jensen Ratio, attempts to exhibit whether or not the fund performance is superior or inferior according to the benchmark index rather than the comparison of a fund group among themselves. On the other hand, Jensen's Alpha Ratio and Information Ratio give closer results for the funds with low non-systematic risk. Nevertheless, serious differences occur between two methods in terms of results in the funds with high non-systematic risk (Kılıç, 2002: 78).

2.4.2.5. Fama Measure

Fama (1972: 551) states the returns on managed portfolios can be judged relative to the selected portfolios with similar levels of risk, by dividing the portfolio performance into its components. Fama measured portfolio performance by the excess return over the expected return against the total risk premium and stated that the portfolio performance depends on the manager's security selection and market timing ability (Fama, 1972: 557-561).

According to Fama, this measure is formulated as follows:

$$\text{Fama Measure} = (R_p - R_f) - \left[\frac{\sigma_p}{\sigma_m} \right] (R_m - R_f)$$

In this formula, σ_p is portfolio risk, σ_m is market risk, R_p is the return on the portfolio, R_f is risk-free rate, and R_m is the market return. In the case of Fama

Measure gives a positive result, the portfolio provides an excess return above the expected return or vice versa (Fama, 1972: 560).

2.4.3. Multi Index Models

In performance measurement, Single index models evaluate only the security selection ability of the portfolio managers. Another important factor in performance measurement is the market timing ability of the portfolio manager, which indicates the success of forecasting market movements. The security selection ability and market timing ability of the portfolio managers can be evaluated together with the help of multi index models (Ural, 2010: 49).

Timing ability can be defined as the strategy of changing the weight of securities on the portfolio to obtain gains in the bull market or to avoid losses in the bear market (Becker et al, 1994: 528). Two basic methods are used to measure the selection and timing ability of the portfolio managers, which indicate the success of forecasting market movements. These multi index models are Quadratic Regression Model, which was developed by Treynor and Mazuy (1966) and Dummy Regression Model, which was developed by Henriksson and Merton (1981) (Bodie et al, 2005: 879).

2.4.3.1. Quadratic Regression Model

Treynor and Mazuy (1966) investigated whether or not the managers of the mutual fund are successful to forecast the major turns in the stock market. The model is based on the assumption that the systematic risk (beta) of the portfolio will not be constant over time and that the fund risk will change due to the fund manager's efforts to anticipate market movements. Therefore, Treynor and Mazuy have added a new term (γ_p) to the basic linear model used to measure the timing ability of managers. (Mazuy and Treynor, 1966: 132; Jagric et al., 2007: 238) The model is formulated as follows.

$$R_p - R_f = \alpha_p + \beta_p(R_m - R_f) + \gamma_p(R_m - R_f)^2 + e_p$$

Unlike Jensen, the term γ_p is added in the quadratic model. In this equation, α_p symbolizes the security selection ability of fund managers, β_p demonstrates the systematic risk of the fund and γ_p represents the market timing ability of the fund manager. The positive coefficient γ_p indicates that the fund manager has high market timing ability, while the negative γ_p coefficient indicates that the manager has no timing ability (Alexander and Sharpe, 1989: 406).

This model tests the non-linear relationship between the fund's excess return and the market's excess return. As soon as the market starts to go up, fund managers should immediately incorporate high-beta securities into the portfolio. When the market starts to go down, it is necessary to prevent loss of the portfolio by shifting from high-beta securities to low-beta securities. When the market's return decrease, low-beta funds or when the market's return increase, high- beta funds will be ranked higher (Becker et al, 1994: 556).

2.4.3.2. Dummy Variable Regression Model

In the quadratic regression model developed by Treynor and Mazuy (1966), it is assumed that the portfolio is evaluated according to the rise and fall of the market and that the portfolio has different beta values in each changing situation. In the dummy variable regression model developed by Henrikson and Merton (1981), similarly, the portfolio performance is evaluated according to the rise and fall of the market and the beta value of the portfolio which vary in each changing situation. However, the basis of the Henrikson and Merton model is based on that the portfolio managers can only anticipate the direction of the market but cannot foresee how long this trend will last. In the model, two linear regression with dummy variables are used to measure the timing ability of the managers in the bull and bear markets since the portfolio manager has the ability to choose between two securities, only stock and treasury bills (Alexander and Sharpe, 1989: 408; Jagric et al, 2007: 238). Model is formulated as follows:

$$R_p - R_f = \alpha_p + \beta_p(R_m - R_f) + \gamma_p[D (R_m - R_f)] + e_p$$

where α_p symbolizes the security selection ability of portfolio managers, β_p represents the systematic risk of the portfolio and γ_p indicates market timing ability

of the portfolio manager and D is the dummy variable that express the up and down markets.

In the formula; the variable D takes the value of one when $R_m > R_f$, whereas variable D takes the value of zero when $R_m < R_f$. If γ_p has a positive value, it means that there is a successful market timing and that the success is due to the manager's forecasting ability rather than chance and that a successful timing is performed (Brown et al., 2003: 641). Many studies conducted to measure the success of portfolio managers in market timing have ascertained that managers failed in the market timing (Yıldız, 2006: 120).

After explaining the performance measurement methods in detail, in this part of the study, the studies on performance evaluation of mutual funds that are conducted in international literature and Turkey will be examined.

2.5. EMPIRICAL STUDIES IN INTERNATIONAL LITERATURE

Risk and return concepts have been investigated separately in the studies which were conducted before 1960. In the mid-1960s, Treynor (1965), Sharpe (1966) and Jensen (1967) developed three performance measurement models, which are referred to by their names, by making use of CAPM. In addition, Treynor and Mazuy (1966) and Henriksson and Merton (1981) have also developed models for the timing abilities of portfolio managers. In this part of the study, the studies in the international literature on performance evaluation that was conducted will be examined.

Smith and Tito (1969: 458) measured the performance of 38 mutual funds in the analysis period between 1958 and 1967. In the study Sharpe Ratio, Treynor Ratio, Jensen's Alpha Ratio were used as the performance measure. In addition, the efficiency of the performance measuring methods was aimed to be tested as well as the performances of the mutual funds at the end of the study. The study showed that there was a high correlation among the results of the performance criteria and the performances of the funds remained low when compared with the return of the market (Smith and Tito, 1969: 470).

Carlson (1970: 1) evaluated the mutual fund portfolios, which consist of common stock funds, balanced funds, and income funds, for the period 1948-1967. The author aimed to test the predictive value of past results in forecasting the future performance of mutual funds and whether fund performance against the market is greatly influenced by fund type, time period and market index. New York Stock Exchange (NYSE) Composite Index, the Standards & Poors (S&P) Composite Stock Price Index, and the Dow Jones Industrial Index were used as the market index in the study. As a result of the study, Carlson (1970: 22) stated that the past performance of the common stock funds was not successful in anticipating their future performance, in other words; the performance did not show continuity. Carlson (1970: 23) also stated that the reason for the funds to provide more earnings than the market average was related to the chosen analysis period and market index, not because of the greatness of the fund or the rate of fund expenses to the return of the fund which was corrected according to the risk.

Mc Donald (1974: 311) aimed to measure and evaluate the objectives and returns of 123 American mutual funds using their monthly returns in the period 1960-1969. In line with this aim, the performance characteristics of each fund are analyzed by Sharpe Ratio, Treynor Ratio and Jensen's Alpha in the study. The results of the study indicated that the average returns of the funds with more "aggressive" objectives produced better performance in this period according to the mean return to beta (Mc Donald 1974: 331).

Lehman and Modest, (1987: 233), in their study, attempted to investigate if conventional measures of abnormal mutual fund performance are sensitive to the reference portfolio chosen in order to evaluate normal performance. In the finance literature, CAPM is used by many investigators as a reference benchmark to evaluate the mutual funds' performance and there is much evidence showing that the use of CAPM as a reference benchmark is inefficiency. The apparent inefficiency of the market proxies and concern over the testability of the CAPM have caused investigators to find out alternative Arbitrage Pricing Theories (APT) (Lehman and Modest, 1987: 234). In line with their aim, Lehman and Modest (1987: 233) employed the standard CAPM benchmarks and different kinds of APTs and have constructed a few reference portfolios. The Center for Research in Security Prices

(CRSP) equally weighted and value-weighted indices of NYSE stocks are used for the implementation of CAPM and a two-step procedure is used for the construction of APT. Firstly, the sensitivities to the common factors are estimated for a collection of individual securities. In the second step, these estimated factor loadings are used to construct basis portfolios to mimic the common factors (Lehman and Modest, 1987: 239). In the context of the study, Lehman and Modest (1987: 243) analyzed the performance of 130 mutual funds over the fifteen-year period 1968 through 1982. At the end of the study, Lehman and Modest (1987: 245) reached the conclusion that there is little similarity among mutual fund rankings obtained from the standard CAPM benchmarks and different kinds of APTs and thus it is crucial to choose the suitable model for risk and return. On the other hand, interestingly, Jensen measure is found sensitive to the security pricing models to measure the normal performance.

Grinblatt and Titman (1993: 48) aimed to examine whether there are mutual fund managers who have stock selection abilities that generate abnormal returns or not. In line with this aim, they tested the quarterly holdings of 155 mutual funds from 1974 to 1984 by using Jensen Measure. The Jensen measure of the funds was calculated with four sets of benchmark portfolios. These benchmarks are the monthly rebalanced equally-weighted portfolio of CRSP securities, the CRSP value-weighted index, ten-factor portfolios created by Lehman and Modest (1987), and the eight-portfolio benchmark developed by Grinblatt and Titman (1988). As a result of the study, Grinblatt and Titman (1993: 66) indicated that the CRSP-listed quarterly holdings of mutual fund portfolios, on average, achieved positive abnormal investment performance, and abnormal performance was found in the aggressive growth funds, and not all mutual fund managers achieved superior performance. However, they stated that the return of the mutual funds is above normal in the comparison they made without using a reference portfolio and when the management expenses are added this extra return is balanced. The authors also have claimed that investors can get a return more than normal by following the fund managers.

In the same year with Grinblatt and Titman (1993), Blake et al (1993: 373) used separate models which were linear and non-linear in their study with which the performance of the weighted bond mutual funds was aimed to be measured. They paid attention to terminate the tendency to survive off the weighted bond mutual

funds and keeping their number high in the selection of the data necessary for the two models. The sample included two different samples of the bond funds being traded in the USA market for the years from 1979 to 1989. The sample included two different samples of the bond funds being traded in the USA market for the years from 1979 to 1989. The first of these samples consists of the 46 nonmunicipal bond funds and the second sample consists of all bond funds that existed at the end of 1991. They used several Lehmann Brothers indices consisting of various government, mortgage, and investment-grade corporate bond indices from in order to measure performance in this study. The linear model was used in the study can be thought of as a single index model similar to the market model used in the evaluation of common stocks. The results obtained through this model showed that the performance of the weighted bond mutual fund underperforms relevant indexes and, on average, a percentage-point increase in expenses leads to a percentage-point decrease in performance. It was also reported that the weight of the non-linear model closely matched actual composition weights. In addition, in the study, it was emphasized that there was no strong evidence indicating that the post-performance of the weighed bond mutual funds would be a sure sign in the prediction of their future performance (Blake et al, 1993: 402).

Study of Kahn and Rudd (1995) is one of the essential papers which attempts to investigate the persistence of mutual fund performance. To investigate fund persistence, Kahn and Rudd (1995: 45) employed 300 active domestic equity funds that operated between the years 1983 and 1987 and fixed-income mutual funds which operated between the years 1986 and 1990. In the study, Kahn and Rudd (1995: 46) used a variety of performance metrics based on “alphas” plus style analysis and measured the persistence of mutual funds’ performance in terms of total return, selection return and information ratios of the managers and investigated the persistence by using the equation shown below through regression analysis regressing Period 2 performance against Period 1 performance.

$$\text{Performance (2)} = a + b * \text{Performance (1)} + \epsilon$$

In doing so, Kahn and Rudd (1995: 45) used contingency tables to test persistence. They categorized funds as winner and loser for each Period. If the "b" is significant and positive, it means that winners in Period 1 remain winners in Period

2. Hence, there is evidence for persistence. At the end of the study, Kahn and Rudd (1995: 49) found no evidence for persistence between equity mutual funds managers, but found selection returns, information ratios and performance persistence for fixed-income funds even after controlling for fund style and management fees.

Blake et al (1996: 134) examined mutual fund predictability for common stock funds which operated in USA markets between 1977 and 1993 and measured performance using risk-adjusted returns. To examine predictability, Blake et al (1996: 137) designed a sample that is free of survivorship bias and in order to measure and compare performance, they adjusted for the risk to the fund. In the study, a fund's risk-adjusted performance is based on the intercept (α_i) from a four-index model. The model is;

$$R_{it} = \alpha_i + \beta_{iSP} R_{SPt} + \beta_{iSL} R_{SLt} + \beta_{iGV} R_{GVt} + \beta_{iB} R_{Bt} + \epsilon_{it}$$

Where, R_{it} denotes the excess return on fund i in month t , R_{SPt} is the excess return on the S&P 500 Index in month t , R_{SLt} is the difference in return between a small-cap and large-cap stock portfolio based on Prudential Bache indexes in month t , R_{GVt} is the difference in return between a growth and value stock portfolio based on Prudential Bache indexes in month t , R_{Bt} the excess return on a bond index in month t , measured by a par-weighted combination of the Lehman Brothers Aggregate Bond Index and the Blume/Keim High-Yield Bond Index, β_{ik} is the sensitivity of excess return on fund i to excess return on index k ($k = SP, SL, GV, B$), and ϵ_{it} is the random error in month t .

The equation was used to calculate both 1-year and 3-year risk-adjusted performance measures, which they referred to as "alphas." At the end of the study, Blake et al (1996: 156) found that past performance could be used in the prediction of the future risk-adjusted performance. The past performance of the funds formed through modern portfolio theories was a successful indicator in the prediction of future performance while deciding the content of the common stock funds. It was also shown in the study that it was possible to reach a higher performance by creating a new portfolio, which was traded actively and provided a high return, by making use of an index fund with the same level of risk. It was also mentioned that the risk-adjusted return of the portfolio, which was formed according to the techniques proposed by modern portfolio theory, was little but statistically significant positive in

the period during which the risk-adjusted return of the mutual funds was negative for the same time interval.

Plantinga et al (2001: 6) examined the downside risk of the performances of the risk-adjusted mutual fund trading in the Euronext markets. The data needed to let models formed in the research run were provided from the 72 monthly data of securities mutual funds traded in Belgium, France, and the Netherlands between 1994 and 1999. The relation between the risk choices of the investor and the risk-adjusted performance measurement was examined in the study. The researchers put forth the idea that upside potential ratio would be a better alternative than Sharpe ratio in the use of options and in the more sensitive evaluation of the prediction ability by looking at the results they achieved (Plantinga et al: 2001: 13).

Artikis (2003: 1), in the study, aimed to evaluate the performance of ten domestic balanced mutual funds operating in the Greek financial market over the period from January 1995 to December 1998. In doing so, he ranked the mutual funds on the basis of total risk, systematic risk, coefficient of variation, their return, and the Ratios of Treynor, Sharpe, and Jensen. According to the performance test results using these measures, Artikis (2003: 4) found that balanced mutual funds have a lower return than the return of the General Index of the Athens Stock Exchange (ASE) over the evaluation period. However, there was a positive correlation among return and risk in the majority of the balanced mutual funds, and the beta coefficients of all funds were lower than one. Artikis (2003: 7) also found that the ranking of balanced mutual funds varied to some extent between the measures used in the study while certain funds were ranked in the same order regardless of the measures used and seven mutual funds had superior performance whereas the other three had performed poorly according to the Jensen measure.

Lazaridis et al (2005: 101) evaluated the risk-adjusted performance of Greek equity funds during the period 1997-2000. The study is based on weekly data for equity mutual funds and includes 23 equity funds that existed for the whole period under consideration. Mutual funds were ranked according to Sharpe Ratio, Treynor Ratio, and Jensen Ratio. Lazaridis et al (2005: 111) found that equity funds have neither the same risk nor the same return and there are big differences among the equity mutual funds with respect to risk and return. In addition, equity funds had a

positive return for the first three years and a negative return for the fourth year. However, the beta of all mutual funds was smaller than one for the four-year period. According to Lazaridis et al (2005: 101) the investor should know the long-term behavior of mutual funds in order to make the right investment decision.

Arugaslan et al (2008: 10) evaluated the performance of the 20 largest US-based mutual funds using risk-adjusted returns during 1995-2004. In the study, M^2 measure, which is a risk-adjusted performance measure, and a variation of the Sortino Ratio to account for downside risk were used to measure these equity funds. This study was conducted for the five-year period 2000-2004 and for the ten-year period 1995-2004. Mutual fund performances were compared to national and international benchmark portfolios. According to the results that Arugaslan et al (2008: 14) stated that the risk has a big impact on the attractiveness of funds. This means that the funds with the high returns may lose their attractiveness once the degree of risk is factored into their performance or funds with low risk may look very attractive once their low risk is had been factored into the analysis.

Huang et al (2011: 2581) aimed to investigate the performance results of risk-shifting behavior to evaluate the financial costs and gains to the investors. In line with this aim, they used the quarterly holdings of a sample of 2,979 U.S. equity funds over the period between 1980 and 2009 using the CAPM, Fama-French three-factor model (Fama and French, 1993), Carhart Four factor model (Carhart, 1997), Ferson and Schadt model (Ferson and Schadt, 1996), and the Pastor and Stambaugh models (Pastor and Stambaugh, 2003). However, to measure the risk shifting of mutual funds, they developed a measure that is stated as the difference between a fund's present volatility and their past volatility. To estimate the volatility of fund f at time t , they computed the square root of VAR (RH_{ft}). They calculated RH_{ft} as follow;

$$RH_{ft} = \mathbf{w}_{f,t}^i \mathbf{R}_t^i = \sum_{i=1}^N w_{f,t}^i R_t^i$$

Where $\mathbf{R}_t$ is the vector of the returns for all available securities and $\mathbf{w}_{f,t}$ is the vector for the portfolio weights invested in these securities by fund f at time t . The variance of the holdings return of mutual funds f at time t depends on the weights invested in the different securities and on the $N * N$ variance-covariance matrix of the individual securities Σ and $VAR (RH_{f,t})$ can be formulated as follows;

$$VAR (RH_{f,t}) = VAR(w_{f,t}^i R_t) = w_{f,t}^i VAR (R_t) w_{f,t} = w_{f,t}^i \sum_t w_{f,t}$$

According to the results obtained from their calculations, Huang et al (2011: 2612) expressed that risk-shifting mutual funds performed worse than mutual funds that keep the level of risk. In addition, they also expressed that the funds that tend to increase the level of risk have performed poorly after increasing the level of risk.

Vysniauskas and Rutkauskas (2014: 403) aimed to test the worked out ratios and distinguish among the best ones. In line with this aim, Vysniauskas and Rutkauskas (2014: 404) evaluated the performance of 10 mutual funds registered in Lithuania for the period from 02.01.2012-15.10.2013 analyzing the monthly prices. They calculated and interpreted the beta coefficients, standard deviations, and returns of funds and Sharpe Ratio, Treynor Ratio and Jensen Ratio that are based on these data. As a result, Vysniauskas and Rutkauskas (2014: 406) found that not all funds have outperformed benchmark indexes, and thus they explained that it is better to manage mutual fund portfolios individually. In addition, they also found that only the Jensen ratio has shown the best performance while other performance measures have no relations among their values and performance of funds. On the other hand, the hypothesis which states that there is a relationship between low transaction cost and mutual funds' fees were rejected in their study. Lastly, Vysniauskas and Rutkauskas (2014: 407) stated that the most successful fund according to Sharpe Ratio was the OMX Baltic Benchmark Fund, whereas the SEB Actively Managed 100 Fund was according to Treynor Ratio. The highest performing fund is Finasta New Europe TOP-20 Sub-fund according to results based on Jensen's Alpha. The most unsuccessful fund in all three methods has been Finasta Baltic Fund.

Osha (2017: 85) conducted a study on the performance of Indian equity diversified mutual funds from January 2013 until February 2017. The aim of the study was to analyze the relationship between risk and return of Indian equity diversified mutual funds based on total risk and systematic risk. Analysis has been made using risk-adjusted performance measures such as Sharpe Ratio and Treynor Ratio and various financial measures such as Average Return, Standard Deviation, and R^2 . In a nutshell, Mamta and Osha (2017: 91) stated that the results obtained provide thirty percent of Indian equity diversified mutual funds have shown higher and superior returns and the other remaining of funds have shown inferior returns

according to average return results. In addition, in terms of standard deviation, ninety percent of the funds are less risky than the market. Most of the funds have a positive beta of less than one and in terms of R^2 , all mutual funds indicate a higher diversification of the portfolio. According to the results of risk-adjusted performance measures, only one fund has shown higher performance in the terms of Sharpe Ratio, and four funds have shown superior performance in terms of Treynor Ratio.

Curto et al (2018: 6), in their study, used 163 European equity mutual funds that followed active management strategies for the period from January 2000 to December 2016 and aimed to examine the selection and timing abilities of fund managers. In line with this aim, the hypothesis that says the fund managers show successful performance to anticipate market movements was tested. In doing so, Quadratic Regression models proposed by Treynor and Mazuy (1966), Dummy Variable Regression Model proposed by Henriksson and Merton (1981), and a model that consists of a very similar equation proposed by Jensen (1968) as in single index models were used. The scope of the study was divided into two sub-sections as the Pre-crisis period and crisis period to isolate the effects of the crisis that emerged over the study period. Curto et al (2018: 8) stated that the results reached using these models in the study did not support the hypothesis that was tested. In addition, fund managers exhibited negative selection ability and positive market timing ability in the pre-crisis period and the opposite was correct in the crisis period. On the other hand, Curto et al (2018: 12) also stated that the selection ability of fund managers was mostly low since fund managers do not have the ability to predict market movements.

Besides international literature, there are studies that have been conducted mutual funds traded in TCMs and it is observed that these studies are focused on fund performances and returns.

2.6. STUDIES IN TURKEY

Karacabey (1999: 84) conducted a study on the performance of 10 Turkish A type equity funds for the period from January 1997 to June 1999. In the study, Karacabey (1999: 85) aimed to measure the selection and timing ability of the fund

manager by using the Quadratic Regression Model and Dummy Variable Regression model separately. At the end of the study, Karacabey (1999: 94) stated definitely that beta coefficients of funds were quite low. On the other hand, Karacabey (1999: 95) also stated that fund managers did not have the selection and timing ability due to their negative values at % 5 significance level.

Karacabey and Karatepe (2000: 62) evaluated the performances of 9 A type mutual funds for the period from January 1997 to July 1999. In the study, to measure, the performance of funds Karacabey and Karatepe (2000: 58) used Sharpe Ratio, Treynor Ratio, Jensen Alpha and GH1 and GH2 methods, which are developed by Graham Harvey and based on increasing and decreasing the risk level of the index to the risk level of the fund or vice versa. To equalize the risk levels he used a formula shown below;

$$GH1A = R_A - R_{index}^*(\sigma = \sigma A)$$

$$GH1B = R_B - R_{index}^*(\sigma = \sigma B)$$

Where; R_A denotes return of fund A, R_B is the return of fund B, and R_{index}^* is the return of the index whose risk level is equal to the risk of the fund.

Although Graham Harvey method has been developed as an alternative to traditional portfolio evaluation methods, at the end of the study, Karacabey and Karatepe (2000: 63) stated that there were no big differences among the results that the methods have produced. They (2000: 63) also stated that none of the 9 A type mutual funds has shown superior performance than the market.

Another study similar to the work of Karacabey and Karatepe (2000) which was conducted by Erzurumlu and Gürsoy (2001: 44) attempted to measure the performance of 55 A type and 77 B type mutual funds in Turkey with alternative indices such as Treasury bill rates and Istanbul Stock Exchange 100 index over the period of January 1999 – June 2000. In doing so, they used the Sharpe Ratio, Treynor Ratio, Jensen Alpha and Graham Harvey method. To test whether these measures make similar ranking or not, Erzurumlu and Gürsoy (2001: 47) also used Spearman rank correlation analysis and the Wilcoxon Signed Rank test was utilized to analyze the significance of differences in Sharpe Ratio. Erzurumlu and Gürsoy (2001: 52) concluded at the end of the study that A type and B type funds have shown similar performance and these measures ranked A Type funds in the same

manner, but in B type funds rank correlation coefficients were lower. On the other hand, while it is spread that funds have shown lower performance than the market, Erzurumlu and Gürsoy (2001: 52) stated that the Treasury bill is the best investment instrument either in all periods of analysis or previous times.

Arslan (2005: 16) stated that there are many studies in the financial literature that measure the selection ability of fund managers, which is affected by various factors such as the personal characteristics, and education levels of managers. Arslan (2005: 16), in his study, aimed to investigate whether similar performance evaluation methods are applicable in TCMs or not and he tested statistically. In line with this aim, Arslan (2005: 10) analyzed the performance of 45 A Type mutual funds returns for the period of January 2002 – December 2005 using a linear and quadratic regression model. In doing so, he also profited by Cronbach Alpha Model that measures the internal consistency of the data set and based on the correlation among variables to test their reliability statistically. According to the result of the study, Arslan (2005: 13) stated that the average returns of mutual funds diverged from the market return to a great extent and the value of beta coefficients are quite low to predict future price movements in TCMs. Besides, the “c” coefficient was positive for only three funds, that is to say, only managers of these funds have accomplished the right timing. At the end of the study, Arslan (2005: 16) concluded that the methods have been used to measure fund performances produce conflicting results and TCMs are far from being a predictable environment structurally.

Akel (2007: 159) evaluated performances of 51 A Type and 51 B Type Mutual Funds in Turkey based on the data covers the period of January 2000 - December 2004. In the study, Akel (2007: 160) aimed to examine the performance of funds using Sharpe Ratio, Treynor Ratio, and Jensen Alpha and find out if the fund managers have timing abilities using the Quadratic Regression Model and Dummy Variable Regression Model. In addition, Akel has also analyzed the performance persistence of the funds. As a result of the study, Akel (2007: 172) reported that A Type mutual funds provide a lower return than the indicator index and none of the A Type funds have the timing and selection ability. Besides, according to the results of quadratic regression five funds in B type funds provide positive results in terms of the timing ability, whereas eight funds in B type funds

have shown positive performance results according to the dummy variable regression. However, Akel (2007: 172) also reported that A Type funds show performance persistence for the short term, but not for the long term and B Type funds tend to persist their performances for short term as well as long term. All in all, Akel (2007: 173) concluded that B Type mutual funds are more successful than A Type mutual funds in terms of both performance and persistence.

Karakurum et al (2008: 89), aimed to evaluate the past performances of mutual funds in Turkey by using the internationally recognized performance evaluation measures such as Treynor Ratio, Sharpe Ratio, T2 measure, and etc. and help investors in their decision making process by grading and ranking the mutual funds. In line with this aim, a risk-based performance evaluation was conducted using 15 B Type mutual funds consist of variable funds, bond funds, and liquid funds and 5 A Types mutual funds consist of only variable funds, 20 funds in total by forming a data set consisting of these funds daily closing prices between the dates 1 January 2003 and 31 December 2005 for three years long. As a result of the study, It has been observed that İşbank Type B Bond-Bills Fund outperforms all other funds and within the 20 funds, İşbank Type B Liquid Fund showed the lowest score according to the performance evaluation method. When the performances are analyzed according to the raw returns only Garanti A Type Variable Fund has the best performance result. On the other hand, while A type variable funds provide high returns, they do not show the same success according to the fund performance evaluation methods. This is because A type of variable fund contains too much risk compared to other funds. However, when B Type mutual funds are analyzed, the results were exactly the opposite. In the analysis, it was reported that the ranking of the fund with the highest rate of return in terms of the performance evaluation system is incompatible with the ranking of the fund with the highest performance evaluation grade. On the other hand, while A type variable funds mostly provide high returns, these funds do not show the same success according to the fund performance evaluation methods. This is because A type variable funds contain too much risk compared to other funds. Furthermore, when B Type mutual funds are analyzed the results are exactly the opposite. Apart from these, the ranking results according to the

return rates of the funds show similarities with the ranking results obtained according to the fund performance evaluation methods (Karakurum et al, 2008: 103).

Omağ (2010: 235) examined the performance of A Type and B Type Turkish Mutual Funds for the period between 2000 and 2008 by using traditional performance measures such as Sharpe Ratio, Treynor Ratio and, Jensen Alpha. Omağ (2010: 246) concluded that the performances of mutual funds were below expectations and mutual funds have shown lower performance than the market according to Sharpe and Treynor Ratios. On the other hand, Omağ (2010: 235) observed that performance measures gave different results for all mutual funds. Thus, Omağ (2010: 47) suggested using all performance measures together.

Gözbaşı (2010: 104) aimed to evaluate the performance and pricing efficiency of the exchange-traded funds operating in the TCM. In line with this aim, Gözbaşı (2010: 109) first evaluated the performance of exchange-traded funds traded on BIST with conventional A-type index funds, stock funds, and B-type gold funds by using conventional performance methods based on the modern portfolio theory, tracking-error analysis, and the Markowitz mean-variance model. In the next step of the study, Gözbaşı (2010: 138) analyzed the pricing efficiency of exchange-traded funds and investigated the reasons of pricing deviations monitored in exchange-traded funds by using causality analyses of Granger (1969) and Dolado and Lütkepohl (1996), panel regression models, cointegration tests developed by Johansen (1988) and Johansen and Juselius (1990), persistence profile analysis developed by Lee and Pesaran (1993) and Pesaran and Shin (1996). As a result of the evaluations made in the study, Gözbaşı (2010: 185) revealed three important results. The first one was that passive funds operating in Turkey have shown superior performance than funds managed actively. The second one was that pricing deviations in the exchange-traded funds traded on BIST were of mostly temporary nature and the last one was that the factors that increase the mispricing level of exchange-traded funds were low daily transaction volume, high transaction costs, bull markets, increasing intraday volatility, and B-type funds. As a result of the evaluations made, it is observed (2010: 185) that passive character mutual funds operating in the TCM have superior performance than the ones actively managed and the faulty pricing realized is mostly temporary and the factors that increase the faulty

pricing level in the exchange-traded funds are high transaction costs, increased volatility in the day, daily low trading volume, the emerging markets, and the fund is B type.

Coşkun et al (2011: 82) evaluated 80 pension funds traded in Turkey for the period between September 2008 and October 2010. Coşkun et al (2011: 84) aimed to find out the pension funds that have the highest and lowest performance using Sharpe Ratio and M^2 measure based on standard deviation. Coşkun et al (2011: 88) reported that the methods used in the study gave similar results and not all funds had a higher performance than the index. In a nutshell, the author determined that the pension funds do not show successful performance.

Yolsal (2012: 350) evaluated the performances of twenty A Type mutual funds which are issued by intermediaries and banks. In the study that covers the period for between 02.01.2009 and 15.02.2012, Yolsal (2012: 350) used Sharpe Ratio, Treynor Ratio and Jensen Alpha and used the quadratic regression and dummy variable regression methods in order to measure the timing ability of the funds. Eventually, Yolsal (2012: 359) stated that the funds, which are issued by intermediaries, have a lower average return compared to the funds managed by banks, but that the fund with the highest average return was found to be an intermediary fund. Considering fund performances in the context of Sharpe and Treynor Ratios, Yolsal (2012: 360) has emphasized that the funds managed by the banks perform better than the intermediary funds. Nevertheless, only four funds were successful according to the Jensen Alpha. Furthermore, he stated the funds that are issued by intermediaries were unsuccessful in terms of timing ability, but funds managed by the bank were more successful than the intermediary funds. At the end of the study, Yolsal (2012: 360) conducted that intermediary funds are not successful as much as funds managed by banks and stated that bank funds have higher risk but also have higher returns against this risk. Lastly, at the end of the study Yolsal (2012: 360) added that Strategy Portfolio Second Equity Fund (STH) that is intermediary funds and gives the best results in the methods used is an exception.

Ayaydın (2013: 67) conducted a study to exhibit the highest and lowest performances of 34 flexible and balanced pension funds operating in Turkey during the period between 4 Jan 2010-7 Jan 2013. The aim of the study (2010: 61) is to test

whether managers of pension funds are able to succeed in the market process. To test this, Ayaydın (2013: 67) used Sharpe Ratio and M^2 measure, based on the standard deviation, and Treynor Ratio, T^2 measure, and Jensen's Alpha based on systematic risk in the study. According to the results obtained in the study, Ayaydın (2013: 74) stated that pension funds perform poorly than the market. Namely, according to the ranking results that take total risk into account, only 9 funds out of 34 funds outperformed the market portfolio and the remaining underperformed the market portfolio. Furthermore, according to the ranking results which take systematic risk into account, only 12 funds out of 34 funds outperformed the market portfolio and the remaining underperformed the market portfolio. Ayaydın (2013: 75), at the end of the study, also stated that the findings achieved in the study support the study results in the literature.

Tan and Ünal (2015: 37) aimed to evaluate the performance of A-type Turkish funds over the period from 09 January 2009 to 31 October 2014. In the study, 15 A-type equity funds and 18 A-type variable funds were selected and Sharpe Ratio, Treynor Ratio, Jensen's Alpha, and Quadratic Regression Model were used to measure the performance of these funds. As a result of the study, Tan and Ünal (2015: 41) stated that the funds that have higher results had better risk-adjusted performances according to Share and Treynor Ratios. Strategy Securities A Type Equity Fund, Alternatif Bank A-type Equity Fund, Alternatif Bank A-type Variable Fund, Gedik Securities A Type Equity Fund and Finans Yatırım Securities A-type Variable Fund are the five funds which outperformed in terms of Sharpe Ratio and Strateji Securities A Type Equity Fund, Alternatif Bank A Type Variable Fund, Alternatif Bank A-type Equity Fund, Garanti Bank A-type Variable Fund and Gedik Securities A-type Equity Fund are the five funds which outperformed in terms of Treynor Ratio. However, Tan and Ünal (2015: 42) also stated that Jensen's Alpha indicates that fund managers did not have selection ability and only five out of these funds had positive and statistically significant results. In terms of the result of the Quadratic Regression Model, eight out of the funds had positive market timing ability, but solely three of them were statistically significant. At the end of the study, Tan and Ünal (2015: 44) concluded that Turkish equity and variable fund managers

did not have both selectivity skills and market timing ability during the quantitative easing era in general.

Aygören et al (2017: 115) conducted a study on the performance of 146 individual pension funds that were managed by 11 different companies in Turkey in the period between 2010 - 2016. Aygören et al (2017: 116) aimed to understand how the performance of the selected pension fund companies change when new funds added to the portfolio over the period and aimed to see the changes in ranking positions of individual pension fund companies. To test this, Aygören et al (2017: 117) have created four different study periods that are (2010-2016; 2011-2016; 2012-2016; 2013-2016). Analysis has been made using different performance evaluation methods such as Sharpe Ratio, M2, Treynor RAtio and Jensen Alpha. The authors clustered the results into two groups as average positive performance ratios and averaged negative performance ratios. According to the average positive performance ratio results, Aygören et al (2017: 118) stated that AVIVA fund and VAKIF fund have shown higher performance than other companies have in almost all performance models. NN HA fund had the lowest value for the period 2010 - 2016 and 2011 - 2016, whereas the FIBA fund had the lowest value for the period 2012-2016 and 2013 - 2016. Besides, the performance values of all companies were varying in terms of negative performance values. In other words, the funds were different for the four study periods. However, Aygören et al (2017: 119) interestingly stated that not all funds have shown negative performance results according to the Jensen Alpha.

Arslan and Çelik (2018: 65) evaluated the performances of 157 pension mutual funds between January 2014 and December 2017 using Sharpe Ratio based on standard deviation and Treynor Ratio and Jensen's Alpha based on systematic risk. When the performance analysis of the study is examined, in terms of Sharpe Ratio, Arslan and Çelik (2018: 71) stated that 48 out of 157 pension mutual funds outperformed the BIST-100 index that is used benchmark in the study and the remaining of these funds underperformed the BIST-100 index. Moreover, 90 % of the funds that outperformed the market include public foreign debt pension mutual funds whereas, 90 % of the funds that underperformed the market include liquid and money market pension mutual funds. On the other hand, in terms of Treynor Ratio,

Arslan and Çelik (2018: 71) also stated that 21 out of 157 pension mutual funds outperformed the market index and the remaining of 136 funds underperformed the market index. Almost all of the funds that outperformed include equity pension mutual funds while the funds that underperformed include liquid and money market pension mutual funds similarly to Sharpe Ratio results. In terms of Jensen's Alpha, almost half pension mutual funds have shown successful performance. While the successful funds include public foreign debt pension mutual funds and equity pension mutual funds, unsuccessful funds include only public debt pension funds. At the end of the study, Arslan and Çelik (2018: 71) concluded that the funds, in general, do not show better performance than the market and equity pension funds are the most successful funds among all types of pension funds. In addition, Arslan and Çelik (2018: 71) also concluded that the successful results showed by pension mutual funds support the opinion that the stock market will gain in the long term advocated by investment experts.

CHAPTER THREE

METHODOLOGY AND EMPIRICAL FINDINGS

Investment of savings has been the center of interest for all investors for a long time. Therefore, various analyses have been made and techniques have been developed in order to invest the present capital in the securities that will provide the highest return. The collection and investment of the idle funds possessed by the small investors have an important place in the development and gaining depth of the capital market. The occurrence of new instruments in the capital markets and the presence of some uncertainties related to the future have prompted the investors to manage their portfolios more professionally. It is quite difficult for small investors to form an optimal portfolio through their own knowledge of finance. Mutual funds are the primary financial companies that grow and develop rapidly in Turkey as well as the world. For this reason, measuring and evaluating the performance of mutual funds is of great importance in new investment decisions of all individual or institutional investors. In this case, the most important problem that exists in the financial markets is which portfolios formed by different portfolio managers or managed through different methods have shown the highest performance. In accordance with this purpose, the performances of mutual funds have been evaluated by making the required calculations according to the performance measurement methods introduced in Chapter 2.

3.1. AIM OF THE STUDY

As explained in Chapter 1 in detail, mutual funds are financial instruments that are managed professionally. Therefore, they are expected to perform successfully. This study aims to analyze the performance of mutual funds in Turkey for the period from January 2006 to December 2018 by using different performance measurement methods introduced in Chapter 2. In line with this aim, the following hypotheses are tested.

H₁: The performance ranking of mutual funds does not change according to all single index models.

H₂: The performance ranking of mutual funds does not change according to single index models that take total risk into the account.

H₃: The performance ranking of mutual funds does not change according to single index models that take systematic risk into the account.

H₄: The mutual funds show successful performance in terms of the security selection ability or market timing ability.

H₅: The mutual funds show the security selection ability and market timing ability simultaneously.

H₆: Single Index Models and Multi Index Models show similar performance results in terms of the security selection ability of fund managers.

3.2. DATA SET AND PRELIMINARY TESTS

Due to limited data availability, this study has a few limitations. At this stage, all share mutual funds data are aimed to be included into the analysis and to keep the data set as wide as possible on the yearly basis. On the other hand, including all mutual funds into the analysis and evaluating their performances have not become possible due to the fall in the number of funds that were taken into the analysis as long as the data set extends. Accordingly, 34 share mutual funds that have continuous data and are always active, not liquidated within the period from January 2006 to December 2018 have been included in the analysis. These funds are listed in Table 9 with their names and codes.

Table 9: Share Mutual Funds with Codes used in the Study

Code	Fund Name
TI2	İŞ PORTFÖY HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
TI3	İŞ PORTFÖY İŞ BANKASI İŞTİRAKLERİ ENDEKSİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
IGH	ING PORTFÖY BİRİNCİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
ICF	ICBC TURKEY PORTFÖY HİSSE SENEDİ FONU(HİSSE SENEDİ YOĞUN FON)
AK3	AK PORTFÖY HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
YAU	YAPI KREDİ PORTFÖY BIST 100 ENDEKSİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
EC2	GLOBAL MD PORTFÖY BİRİNCİ HİSSE SENEDİ FONU(HİSSE SENEDİ YOĞUN FON)
YHS	YAPI KREDİ PORTFÖY BİRİNCİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
TKF	TACİRLER PORTFÖY HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
ST1	STRATEJİ PORTFÖY BİRİNCİ HİSSE SENEDİ FONU(HİSSE SENEDİ YOĞUN FON)
IYD	İŞ PORTFÖY TEMETTÜ ÖDEYEN ŞİRKETLER HİSSE SENEDİ (HİSSE SENEDİ YOĞUN FON)
GHS	GARANTİ PORTFÖY HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
HAF	HALK PORTFÖY HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
GAF	GEDİK PORTFÖY BİRİNCİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
YAS	YAPI KREDİ PORTFÖY KOÇ HOLDİNG İŞTİRAK VE HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
DAH	DENİZ PORTFÖY HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
VEF	VAKIF PORTFÖY BİST30 ENDEKSİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
HBU	HSBC PORTFÖY BİST 30 ENDEKSİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
TYH	TEB PORTFÖY HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
TIE	İŞ PORTFÖY BIST 30 ENDEKSİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
ADP	AK PORTFÖY BİST BANKA ENDEKSİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
TZD	ZİRAAT PORTFÖY HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
GAE	GARANTİ PORTFÖY BİST30 ENDEKSİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
AYA	ATA PORTFÖY BİRİNCİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
FYD	QNB FINANS PORTFÖY BİRİNCİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
TAU	İŞ PORTFÖY BİST BANKA ENDEKSİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
TTE	İŞ PORTFÖY BİST TEKNOLOJİ AĞIRLIKLI ENDEKSİ HİSSE SENEDİ FONU(HİSSE SENEDİ YOĞUN FON)
AKU	AK PORTFÖY BİST 30 ENDEKSİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
TZK	ZİRAAT PORTFÖY TEMETTÜ ÖDEYEN ŞİRKETLER HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
YEF	YAPI KREDİ PORTFÖY BIST 30 ENDEKSİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
DZE	DENİZ PORTFÖY BIST 100 ENDEKSİ HİSSE SENEDİ FONU(HİSSE SENEDİ YOĞUN FON)
STH	STRATEJİ PORTFÖY İKİNCİ HİSSE SENEDİ FONU(HİSSE SENEDİ YOĞUN FON)
BZI	BİZİM PORTFÖY İNŞAAT SEKTÖRÜ KATILIM HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)
TZE	ZİRAAT PORTFÖY BİST 30 ENDEKSİ HİSSE SENEDİ FONU (HİSSE SENEDİ YOĞUN FON)

In the study, month-end closing values of each mutual fund during the analysis period were obtained from FINNET Fund Exper Programme. There should be a market proxy that represents the mutual funds in the most appropriate way in terms of portfolio structures in order to be used in the models in the performance evaluation of mutual funds. In the study, the BIST-100 index obtained from the CBRT was used as a market proxy. In addition, BIST-KYD 3 months GDS (Government Debt Securities) Indices, which are sensitive to interest rate changes in the market and assumed to follow the changes closely, are used as the risk-free rate of return. These data were also obtained from BIST. Logarithmic returns of data were computed over monthly closing values to obtain the return series of all variables. The calculation was made using the following formula.

$$r_t = \ln \left[\frac{p_t}{p_{t-1}} \right]$$

In the formula, r_t expresses monthly return, p_t is month-end value and p_{t-1} is the previous month-end value.

In addition, in this study, regression analyses are conducted through EViews 9.0 econometric software.

3.2.1. Descriptive Statistics

It is not possible that financial time series comply with normal distribution due to their high volatility in general. The main statistical features of the financial time series are; having extreme kurtosis and skewness values, having asymmetric characteristics during high volatility periods, having volatility clusters and showing changes in return volatility over time. Time series with at least one of these features that have non-normal distribution do not provide robust results (Gökbulut, 2011: 252; Brooks, 2008: 163).

Since descriptive statistics provide the most basic information about the variables subject to analysis, it is necessary to be calculated and interpreted before proceeding to econometric modeling. The smallest and largest values of descriptive statistics, which are important for the financial return series, are used to determine the lowest and highest return values subject to the analysis and the dates when these

values are observed. Thus, prosperity which is the highest point of the fluctuation and crisis periods which is the deepest point of the fluctuation can be determined. The developments in these periods should be taken into consideration in risk analysis and management (Weiss, 2012: 90; Ural, 2010: 79). Descriptive statistics of the study are given in Table 10.

Table 10: Descriptive Statistics for Monthly Mutual Fund Returns

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
TI2	0.005547	0.012629	0.142961	-0.217000	0.061549	-0.51166	3.488398
TI3	0.007863	0.017943	0.178837	-0.200977	0.065981	-0.68301	3.81043
IGH	0.005628	0.014271	0.123816	-0.201419	0.056942	-0.465858	3.150124
ICF	0.007599	0.012069	0.157228	-0.221839	0.057351	-0.573751	4.037269
AK3	0.006674	0.012690	0.192211	-0.228224	0.064058	-0.43996	3.660874
YAU	0.006301	0.012719	0.200704	-0.280908	0.070271	-0.550258	4.270587
EC2	0.003714	0.005142	0.117016	-0.129333	0.047608	-0.175713	2.794353
YHS	0.007792	0.010473	0.175198	-0.187184	0.061846	-0.307723	3.208456
TKF	0.008404	0.010998	0.119190	-0.105569	0.038035	-0.374498	3.540949
ST1	0.013375	0.016863	0.288283	-0.331275	0.07802	-0.582289	5.738958
IYD	0.005581	0.010376	0.115575	-0.159227	0.055121	-0.38849	2.833299
GHS	0.005237	0.010642	0.120922	-0.218235	0.065379	-0.53829	3.30138
HAF	0.009040	0.019894	0.115597	-0.180407	0.059394	-0.547792	3.000404
GAF	0.004167	0.010996	0.153576	-0.297879	0.062793	-0.947392	5.934605
YAS	0.010632	0.015719	0.214391	-0.311125	0.065989	-0.847283	6.104595
DAH	0.004550	0.005976	0.155727	-0.18972	0.059439	-0.314113	3.173822
VEF	0.00512	0.010463	0.179006	-0.29863	0.073794	-0.516144	4.140392
HBU	0.004518	0.011459	0.188231	-0.276136	0.073187	-0.454872	3.848487
TYH	0.007651	0.016854	0.193717	-0.23559	0.069013	-0.415095	3.435146
TIE	0.005734	0.008957	0.181731	-0.24794	0.072059	-0.362762	3.534306
ADP	0.004058	0.012242	0.123725	-0.158486	0.061315	-0.373407	2.636506
TZD	0.004869	0.007685	0.112467	-0.118918	0.04806	-0.213492	2.617858
GAE	0.004202	0.009724	0.177961	-0.297748	0.074391	-0.519336	4.16046
AYA	0.008543	0.012112	0.15746	-0.256236	0.070963	-0.519908	3.677706
FYD	0.011775	0.015334	0.206826	-0.194344	0.065102	-0.256439	3.350229
TAU	0.002027	0.005516	0.233371	-0.297765	0.085189	-0.197487	3.427185
TTE	0.008478	0.013017	0.186599	-0.25056	0.082224	-0.566313	3.464319
AKU	0.005429	0.010192	0.184746	-0.272318	0.072587	-0.452336	3.895566
TZK	0.005903	0.009267	0.113246	-0.152245	0.040104	-0.342371	4.055647
YEF	0.005432	0.010906	0.192714	-0.279802	0.073363	-0.457179	4.021389
DZE	0.004841	0.00945	0.198209	-0.26467	0.072976	-0.465965	3.767222
STH	0.013303	0.009113	0.219509	-0.101837	0.044778	0.693873	5.930757
BZI	0.005153	0.013376	0.175766	-0.292135	0.068011	-0.891131	5.275148
TZE	0.004557	0.009668	0.188383	-0.284400	0.073048	-0.489857	4.133488

According to Table 10, the returns of all mutual funds have positive mean values. When the difference between maximum and minimum values is considered as an indicator of volatility; ST1, TAU, YAS, YAU, and VEF are found as the most volatile five funds. When the standard deviation is taken, the most volatile funds are listed as TAU, TTE, ST1, GAE, and VEF that are ranked at the top five. In terms of skewness, only one fund returns, STH, has positive skewness value, whereas 33 funds have negative skewness values. This demonstrates that STH return is skewed to the right and the other fund returns are skewed to the left. The highest skewness of returns is only observed on STH, whereas the lowest is reported on GAF.

The most important indicators of the normal distribution are kurtosis and skewness. If the kurtosis value of the series is greater than three, the fat tails where the values are concentrated in the extreme region occur, whereas asymmetric effects occur if the skewness value of the series is different from zero, and value at risk analysis give inconsistent and misleading results (Brooks, 2008: 163). All of the funds have positive kurtosis values. While almost all of the mutual funds have kurtosis values that are higher than three, four funds (IYD, EC2, ADP, and TZD) are lower than three.

3.2.2. Unit Root Tests

The time series properties of data are deterministic and stochastic properties. The deterministic properties of the series are that whether or not there are usually fixed, trend and seasonal components in the series, whereas the stochastic properties of the series are mostly related to whether or not the variables are stationary (Tari, 2010: 374). One of the most important aspects of the time series is whether or not these series are stationary. The series analyzed must be stationary in order to obtain statistically meaningful relationships between variables (Brooks, 2008: 207). If there is a trend in the time series of variables, the relationship may appear as a spurious regression rather than being true. Therefore, whether regression refers to a real relationship or a misleading relationship is related to whether time series data are stationary or not (Baumöhl and Lyocsa, 2009: 12). In this study, in order to test whether or not the time series is stationary, the Augmented Dickey-Fuller (ADF)

(1979) and Philipps-Perron (PP) (1988) unit root tests are used. The ADF and PP results are shown in Table 11 and Table 12 below.

Table 11: Unit Root Test Results for ADF

VARIABLES	With Constant		With Constant & Trend	
	t-Statistic	Prob.	t-Statistic	Prob.
TI2	-12.791*	0,000	-12,751*	0,000
TI3	-11.908*	0,000	-11,918*	0,000
IGH	-12.154*	0,000	-12,115*	0,000
ICF	-12.497*	0,000	-12,456*	0,000
AK3	-12.314*	0,000	-12,274*	0,000
YAU	-12.284*	0,000	-12,250*	0,000
EC2	-12.442*	0,000	-12,408*	0,000
YHS	-12,747	0,000	-12,707*	0,000
TKF	-12.839*	0,000	-12,815*	0,000
ST1	-10.847*	0,000	-10,852*	0,000
IYD	-12.010*	0,000	-11,971*	0,000
GHS	-12.210*	0,000	-12,202*	0,000
HAF	-12.110*	0,000	-12,110*	0,000
GAF	-11.150*	0,000	-11,112*	0,000
YAS	-10.663*	0,000	-10,641*	0,000
DAH	-11.456*	0,000	-11,419*	0,000
VEF	-12.856*	0,000	-12,817*	0,000
HBU	-12.771*	0,000	-12,741*	0,000
TYH	-12.470*	0,000	-12,430*	0,000
TIE	-12.880*	0,000	-12,839*	0,000
ADP	-12.235*	0,000	-12,256*	0,000
TZD	-12.928*	0,000	-12,899*	0,000
GAE	-12.924*	0,000	-12,900*	0,000
AYA	-12.531*	0,000	-12,515*	0,000
FYD	-12.018*	0,000	-11,985*	0,000
TAU	-12.332*	0,000	-12,291*	0,000
TTE	-10.954*	0,000	-10,991*	0,000
AKU	-12.860*	0,000	-12,825*	0,000
TZK	-12.085*	0,000	-12,046*	0,000
YEF	-12.808*	0,000	-12,772*	0,000
DZE	-12.536*	0,000	-12,509*	0,000
STH	-11.475*	0,000	-11,576*	0,000
BZI	-11.026*	0,000	-11,007*	0,000
TZE	-12.910*	0,000	-12,883*	0,000
BIST INDEX	-12.428*	0,000	-12,387*	0,000
BIST-KYD GDS 91	-3.535*	0,008	-3,560**	0,037

*, ** denotes statistical significance at the 1 % and the 5 % levels, respectively.

According to the ADF and PP unit root test results presented in Table 11 and Table 12, unit root does not exist for any of the fund returns included in the analysis, as a result it can be stated that they are stationary.

Table 12: Unit Root Test Results for PP

VARIABLES	With Constant		With Constant & Trend	
	t-Statistic	Prob.	t-Statistic	Prob.
TI2	-12,794*	0,000	-12,753*	0,000
TI3	-11,901*	0,000	-11,916*	0,000
IGH	-12,155*	0,000	-12,113*	0,000
ICF	-12,532*	0,000	-12,495*	0,000
AK3	-12,317*	0,000	-12,278*	0,000
YAU	-12,284*	0,000	-12,249*	0,000
EC2	-12,458*	0,000	-12,423*	0,000
YHS	-12,746*	0,000	-12,706*	0,000
TKF	-12,847*	0,000	-12,824*	0,000
ST1	-10,962*	0,000	-10,964*	0,000
IYD	-12,009*	0,000	-11,969*	0,000
GHS	-12,209*	0,000	-12,201*	0,000
HAF	-12,109*	0,000	-12,110*	0,000
GAF	-11,151*	0,000	-11,113*	0,000
YAS	-10,635*	0,000	-10,613*	0,000
DAH	-11,452*	0,000	-11,414*	0,000
VEF	-12,857*	0,000	-12,818*	0,000
HBU	-12,772*	0,000	-12,742*	0,000
TYH	-12,470*	0,000	-12,431*	0,000
TIE	-12,881*	0,000	-12,841*	0,000
ADP	-12,235*	0,000	-12,255*	0,000
TZD	-12,929*	0,000	-12,903*	0,000
GAE	-12,924*	0,000	-12,900*	0,000
AYA	-12,532*	0,000	-12,515*	0,000
FYD	-12,023*	0,000	-11,990*	0,000
TAU	-12,332*	0,000	-12,291*	0,000
TTE	-11,231*	0,000	-11,198*	0,000
AKU	-12,861*	0,000	-12,826*	0,000
TZK	-12,084*	0,000	-12,044*	0,000
YEF	-12,810*	0,000	-12,774*	0,000
DZE	-12,536*	0,000	-12,509*	0,000
STH	-11,697*	0,000	-11,751*	0,000
BZI	-11,031*	0,000	-11,007*	0,000
TZE	-12,904*	0,000	-12,884*	0,000
BIST INDEX	-12,429*	0,000	-12,389*	0,000
BIST-KYD GDS 91 Days	-6,277*	0,000	-6,621*	0,000

* denotes statistical significance at the 1 % level.

3.2.3. Crisis Periods

In this study, crisis periods were used as a dummy variable in the regression model to measure the security selection ability and market timing ability of fund managers. To identify the crisis periods, the CMAX approach that was proposed by Patel and Sarkar (1998) is used. CMAX is the ratio that compares the index value at time t (BIST-100 Index were used in this study) to the maximum value of the index for the periods up to time t . The period until time t is usually chosen one or two years. The variable CMAX is widely used by stock market practitioners as a crisis indicator (Patel and Sarkar, 1998: 51). CMAX ratio can be formulated as follows;

$$CMAX_{i,t} = \frac{P_{m,t}}{\max(P_{m,t-24}, \dots, P_{m,t})}$$

In the formula, $P_{m,t}$ denotes the current closing value of the index at time t .

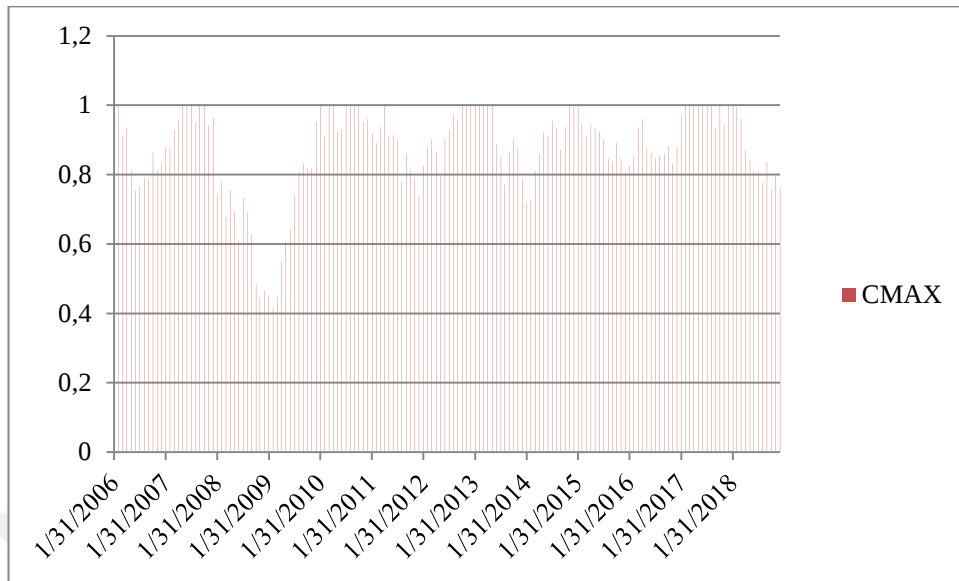
If $CMAX_{i,t} < \overline{CMAX}_t - \sigma_m$; $C_{i,t} = 1$ and crisis is observed.

Otherwise, $C_{i,t} = 0$

$C_{i,t}$ is the crisis indicator for country i and time t . 2, 1.5 or 1 standard deviations below the mean of the series could be used for the trigger level. One standard deviation is used in the study to capture all crises for the analyzed period since the BIST-100 index is sensitive against fluctuations in the Turkish Economy. If the computed CMAX value is 1, it means that prices increase over the period or if prices decrease, it means that CMAX is getting closer to 0. When CMAX drops below a threshold level (mean of CMAX minus standard deviation), a crisis is detected (Patel and Sarkar, 1998: 51).

Crisis periods determined by using the CMAX ratio are illustrated in Figure 10. Over the periods from January 2006 to December 2018 two crisis periods are detected. The first crisis is observed from March 2008 to July 2009, which corresponds to the 2008 global financial crisis, and the last crisis is observed from January 2014 to February 2014, which can be expressed as a short time Turkish financial crisis.

Figure 10: Crisis Periods in BIST



3.3. RESULTS OF SINGLE INDEX MODELS BASED ON TOTAL RISK

The analysis results obtained using Single Index Models that take total risk into account are explained in detail below.

3.3.1. Results of Sharpe Ratio

As explained in Chapter 2, the Sharpe Ratio expresses the excess return, which is demanded by investors over the risk-free rate compared to the total portfolio risk. According to this ratio, the higher the result found when it is used, the higher the performance of the portfolio. The results of Sharpe Ratios of mutual funds are presented in Table 13.

Table 13: Results of Sharpe Ratio

Fund Name	Sharpe Ratio	Rank	Fund Name	Sharpe Ratio	Rank
ADP	-0,082310	31	ST1	0,054735	2
AK3	-0,037941	13	STH	0,093768	1
AKU	-0,050640	17	TAU	-0,083073	32
AYA	-0,007911	7	TI2	-0,057796	19
BZI	-0,058095	20	TI3	-0,018820	9
DAH	-0,076615	28	TIE	-0,046773	15
DZE	-0,058428	21	TKF	-0,018403	8
EC2	-0,113221	34	TTE	-0,007617	6
FYD	0,041023	3	TYH	-0,021058	10
GAE	-0,065894	27	TZD	-0,088126	33
GAF	-0,078629	29	TZE	-0,062256	24
GHS	-0,059146	22	TZK	-0,079819	30
HAF	-0,001081	5	VEF	-0,054000	18
HBU	-0,062661	25	YAS	0,023145	4
ICF	-0,026248	12	YAU	-0,039889	14
IGH	-0,061053	23	YEF	-0,050056	16
IYD	-0,063918	26	YHS	-0,021224	11
Average	-0,039413		Average	-0,039413	

According to the achieved results, that all mutual funds exhibit negative Sharpe Ratios except for STH, ST1, FYD, and YAS. The average Sharpe Ratio of all mutual funds is – 0.039413 for the same period. 13 of mutual funds have outperformed the average. STH, ST1, FYD, YAS, and HAF are 5 funds that exhibit the best performance respectively, whereas EC2, TZD, TAU, ADP, and TZK are 5 funds that exhibit the worst performance respectively.

3.3.2. Results of Risk Adjusted Performance Ratio: (M^2)

As explained in Chapter 2, the M^2 Performance Ratio considers the total risk or standard deviation as risk measurement just as Sharpe Ratio. In this method, the first risk-free rate is added into the mutual fund portfolio that is managed and the adjusted mutual fund that is obtained this way is compared to the market. The M^2 Ratio results of all mutual funds are presented in Table 14.

Table 14: Results of M^2

Fund Name	M^2	Rank	Fund Name	M^2	Rank
ADP	0,002910	31	ST1	0,013224	2
AK3	0,006249	13	STH	0,016161	1
AKU	0,005293	17	TAU	0,002852	32
AYA	0,008509	7	TI2	0,004755	19
BZI	0,004732	20	TI3	0,007688	9
DAH	0,003338	28	TIE	0,005584	15
DZE	0,004707	21	TKF	0,007719	8
EC2	0,000583	34	TTE	0,008531	6
FYD	0,012192	3	TYH	0,007520	10
GAE	0,004145	27	TZD	0,002472	33
GAF	0,003187	29	TZE	0,004419	24
GHS	0,004653	22	TZK	0,003097	30
HAF	0,009023	5	VEF	0,005040	18
HBU	0,004388	25	YAS	0,010846	4
ICF	0,007129	12	YAU	0,006102	14
IGH	0,004509	23	YEF	0,005337	16
IYD	0,004294	26	YHS	0,007507	11
Average	0,006138		Average	0,006138	

According to Table 14, all of the mutual funds have positive values. Average of M^2 Performance Ratio of all funds is 0.006138. 13 of mutual funds have outperformed average M^2 Performance Ratio and STH, ST1, FYD, YAS, and HAF are 5 funds that exhibit the best performance respectively, whereas EC2, TZD, TAU, ADP, and TZK are 5 funds that exhibit the worst performance respectively. Furthermore, it can be seen that the ranking is exactly the same as the Sharpe Ratio.

3.4. RESULTS OF SINGLE INDEX MODELS THAT BASED ON SYSTEMATIC RISK

The analysis results obtained using Single Index Models that take systematic risk into account are explained in detail below.

3.4.1. Results of Treynor Ratio

Unlike the Sharpe Ratio, it uses the beta coefficient as an indicator of portfolio risk instead of standard deviation. The results of the Treynor Ratio are presented in Table 15.

Table 15: Results of Treynor Ratio

Fund Name	Treynor Ratio	Rank	Fund Name	Treynor Ratio	Rank
ADP	-0.004764	34	ST1	0.005410	2
AK3	-0.002177	14	STH	0.006160	1
AKU	-0.003682	24	TAU	-0.008532	36
AYA	-0.000562	7	TI2	-0.003071	19
BZI	-0.004206	29	TI3	-0.001267	10
DAH	-0.004016	27	TIE	-0.003349	22
DZE	-0.004301	30	TKF	-0.000445	6
EC2	-0.003768	26	TTE	-0.000972	8
FYD	0.002542	3	TYH	-0.001405	12
GAE	-0.005037	35	TZD	-0.003110	20
GAF	-0.004608	32	TZE	-0.004585	31
GHS	-0.003588	23	TZK	-0.001916	13
HAF	-0.000061	5	VEF	-0.004073	28
HBU	-0.004641	33	YAS	0.001505	4
ICF	-0.001385	11	YAU	-0.002721	16
IGH	-0.002955	18	YEF	-0.003717	25
IYD	-0.002853	17	YHS	-0.001129	9
Average	-0.002273		Average	-0.002273	

The average Treynor Ratio of all mutual funds is -0.002273. According to this average, 14 mutual funds have exhibited higher than average performance. This Ratio is positive for only 4 funds. Although deviant results were obtained in analyzes made with the measures based on systematic risk, the Treynor Ratio exhibits the closest ranking to the measures based on total risk. According to Treynor Ratio results, STH, ST1, FYD, YAS, and HAF are 5 funds that exhibit the best performance respectively, whereas TAU, GAE, ADP, HBU, and GAF are 5 funds that exhibit the worst performance respectively.

3.4.2. Results of Jensen's Alpha

Jensen's Alpha is an absolute performance measure and gives relative performance ranking among funds, unlike Sharpe and Treynor Ratios. The results of Jensen's Alpha are presented in Table 16.

Table 16: Results of Jensen's Alpha

Fund Name	Jensen's Alpha	Rank	Fund Name	Jensen's Alpha	Rank
ADP	-0.001042	32	ST1	0.007254	1
AK3	0.001790	14	STH	0.006775	2
AKU	0.000099	22	TAU	-0.003941	34
AYA	0.003216	7	TI2	0.000822	19
BZI	-0.000399	27	TI3	0.002463	11
DAH	-0.000267	25	TIE	0.000434	20
DZE	-0.000516	28	TKF	0.005242	5
EC2	0.000017	24	TTE	0.001810	13
FYD	0.006643	3	TYH	0.002457	12
GAE	-0.001223	33	TZD	0.000914	18
GAF	-0.000886	31	TZE	-0.000798	29
GHS	0.000207	21	TZK	0.003115	8
HAF	0.003913	6	VEF	-0.000286	26
HBU	-0.000850	30	YAS	0.005364	4
ICF	0.002603	10	YAU	0.001091	16
IGH	0.000972	17	YEF	0.000063	23
IYD	0.001145	15	YHS	0.003083	9
Average	0.001508		Average	0.001508	

10 out of 34 funds have negative Jensen's Alpha. If Jensen's alpha is positive, it can be said that fund managers are successful and have selection ability. Because Jensen's Alpha is an indicator of the security selection ability of fund managers. In this situation, 24 funds have security selection ability. The average Jensen's Alpha of all mutual funds is 0.001508 and 14 funds have outperformed the average.

When the fund managers exhibited successful performance in portfolio management, Alpha demonstrates how much of this successful performance is achieved by returns adjusted for risk. In other words, Alpha implies whether or not fund managers are successful in either forecasting market returns or selecting overvalued securities for the portfolio, or both (Brown and Reilly, 2012: 1119).

According to Jensen's Alpha results, ST1, STH, FYD, YAS, and TKF are 5 funds that exhibit the best performance respectively, whereas TAU, GAE, ADP, GAF, and HBU are 5 funds that exhibit the worst performance respectively.

3.4.3. Results of T^2 Measure

T^2 Measure adjusts risk by adding risk-free securities to the fund and converts Treynor Ratio into the percentage return (Yücel, 2016: 152). The results of T^2 Measure are presented in Table 17.

Table 17: Results of T^2 Measure

Fund Name	T^2 Measure	Rank	Fund Name	T^2 Measure	Rank
ADP	-0.000983	32	ST1	0.009191	2
AK3	0.001603	14	STH	0.009941	1
AKU	0.000099	22	TAU	-0.004751	34
AYA	0.003219	7	TI2	0.000710	18
BZI	-0.000425	27	TI3	0.002513	10
DAH	-0.000236	25	TIE	0.000431	20
DZE	-0.000520	28	TKF	0.003335	6
EC2	0.000012	24	TTE	0.002809	8
FYD	0.006322	3	TYH	0.002375	12
GAE	-0.001257	33	TZD	0.000671	19
GAF	-0.000827	30	TZE	-0.000804	29
GHS	0.000193	21	TZK	0.001864	13
HAF	0.003719	5	VEF	-0.000293	26
HBU	-0.000861	31	YAS	0.005285	4
ICF	0.002395	11	YAU	0.001059	15
IGH	0.000826	17	YEF	0.000063	23
IYD	0.000927	16	YHS	0.002652	9
Average	0.001508		Average	0.001508	

T^2 Measure is negative only for 10 funds and positive for 24 funds. The average T^2 Measure of all funds is 0.001508. According to this, 14 of the funds have outperformed the average and STH, ST1, FYD, YAS, and HAF are 5 funds that exhibit the best performance respectively, whereas TAU, GAE, ADP, HBU, and GAF are 5 funds that exhibit the worst performance respectively.

3.4.4. Results of Information Ratio

Information Ratio or Appraisal Ratio represents different unsystematic risk levels by dividing Jensen's Alpha of funds to unsystematic risk of the funds. The results of Information Ratio are presented in Table 18.

Table 18: Results of Information (Appraisal) Ratio

Fund Name	Appraisal Ratio	Rank	Fund Name	Appraisal Ratio	Rank
ADP	0.401103	7	ST1	2.835595	3
AK3	-0.605709	20	STH	-10.821428	33
AKU	-0.261556	17	TAU	-1.172896	25
AYA	-5.194687	31	TI2	-0.215622	15
BZI	1.068328	5	TI3	-2.269719	28
DAH	0.071327	9	TIE	-0.798379	22
DZE	2.134264	4	TKF	-0.417843	18
EC2	-0.001854	10	TTE	0.410684	6
FYD	-3.296502	29	TYH	-1.894446	27
GAE	-7.201328	32	TZD	-0.111449	12
GAF	0.346046	8	TZE	3.371415	2
GHS	-0.090022	11	TZK	-0.219338	16
HAF	-1.427640	26	VEF	-11.876695	34
HBU	4.883824	1	YAS	-3.626405	30
ICF	-0.765361	21	YAU	-1.018054	24
IGH	-0.211274	14	YEF	-0.427998	19
IYD	-0.204535	13	YHS	-0.804580	23
Average	-1.159198		Average	-1.159198	

Table 18 represents that 9 out of 34 funds have positive Information Ratio. Funds with positive Information Ratio are HBU, TZE, ST1, DZE, BZI, TTE, ADP, GAF and DAH respectively. For that period, the average Information Ratio of all funds is -1.159198. According to the average, 24 funds have outperformed the average. According to the results of Information Ratio, HBU, TZE, ST1, DZE, and BZI are 5 funds that exhibit the best performance respectively, whereas VEF, STH, GAE, AYA, and YAS are 5 funds that exhibit the worst performance respectively.

3.4.5. Results of Fama Measure

According to Fama (1972), portfolio performance depends on the manager's selection and timing ability. The results of Fama Measure are presented in Table 19.

Table 19: Results of Fama Measure

Fund Name	Fama Measure	Rank	Fund Name	Fama Measure	Rank
ADP	-0.001967	32	ST1	0.008190	1
AK3	0.000787	13	STH	0.006448	2
AKU	-0.000030	17	TAU	-0.002798	33
AYA	0.003003	6	TI2	-0.000466	19
BZI	-0.000535	20	TI3	0.002073	8
DAH	-0.001568	29	TIE	0.000249	15
DZE	-0.000598	22	TKF	0.001211	12
EC2	-0.002999	34	TTE	0.003504	5
FYD	0.005941	3	TYH	0.002013	9
GAE	-0.001165	27	TZD	-0.001821	31
GAF	-0.001783	30	TZE	-0.000878	25
GHS	-0.000583	21	TZK	-0.001187	28
HAF	0.002919	7	VEF	-0.000278	18
HBU	-0.000910	26	YAS	0.004842	4
ICF	0.001376	11	YAU	0.000727	14
IGH	-0.000616	23	YEF	0.000013	16
IYD	-0.000754	24	YHS	0.001794	10
Average	0.000710		Average	0.000710	

As it is seen in Table 19, 16 funds are positive according to the Fama Measure and these funds provide higher returns compared to expected returns. The other 18 funds have a negative value. The average of all funds achieved using this measure is 0.000710 for the same period. As a result, 14 funds have outperformed the average. According to Fama Measure, ST1, STH, FYD, YAS, and TTE are 5 funds that exhibit the best performance respectively, whereas EC2, TAU, ADP, TZD, and GAF are 5 funds that exhibit the worst performance respectively.

3.5. RESULTS OF MULTI INDEX MODELS

Single Index Performance Models evaluate only the selection ability of the portfolio managers. However, when the effects of fluctuations occurred in the financial markets on capital asset returns are taken into consideration, the timing ability of fund managers in providing convenient portfolio structure comes into prominence. Quadratic Regression Model that was introduced by Treynor and Mazuy (1966) and Dummy Variable Regression Model that was introduced by Merton and Henriksson (1981) are used in measuring fund managers' timing ability that

expresses their success in predicting market movements. The security selection ability and market timing ability of fund managers have analyzed by the help of the regression models mentioned above. The calculated analysis results are presented in the form of tables below. The selection ability coefficient, which is seen on the table, measures the success of fund managers in portfolio diversification and it is expected to be a statistically significant positive value. Beta coefficient expresses the sensitivity of the fund in question against the market index and if the coefficient is bigger than 1, it means that the return of the fund in question is higher than market return but when the coefficient is smaller than 1, this means that fund return is lower than the market. The timing ability coefficient shows fund managers' success in forecasting market movements and this is expected to be a statistically significant positive value.

3.5.1. Results of Quadratic Regression Model

As explained in Chapter 2, the selection ability and market timing ability of fund managers can be measured by using the Quadratic Regression Model. In this model, the portfolio has a different beta value in every changing situation compared to the market's rise and fall. Table 20 presents the results of the Quadratic Regression Model.

Table 20: Results of Quadratic Regression Model

Fund Name	Security Selection (α_p)	Rank	Beta (β_p)	Rank	Market Timing (γ_p)	Rank
ADP	-0.003949	33	0.712213*	24	0.283506	2
AK3	0.001092	16	0.804364*	14	-0.085659	15
AKU	0.000103	22	0.925973*	8	-0.049522	13
AYA	0.003982***	8	0.879468*	11	-0.216744	24
BZI	0.003011	11	0.738107*	20	-0.741787	31
DAH	-0.002555	31	0.712630*	23	0.123688	6
DZE	-0.000359	25	0.929074*	7	-0.069729	14
EC2	0.003841**	9	0.575159*	30	0.111143	7
FYD	0.004560***	5	0.793858*	16	0.197646	4
GAE	-0.000595	27	0.944893*	2	-0.130649	17
GAF	0.002797	12	0.710852*	25	-0.897459**	33
GHS	0.000453	18	0.801412*	15	-0.229373	25
HAF	0.003509	10	0.644289*	28	-0.202294	23
HBU	-0.000801	29	0.931775*	5	-0.046754	12
ICF	0.004507***	6	0.603148*	29	-0.663716	29
IGH	-0.000208	24	0.666919*	26	-0.132840	18
IYD	-0.001477	30	0.664266*	27	0.082768	8
ST1	0.012164*	1	0.810537*	13	-0.858845	32
STH	0.007065**	4	0.224624*	34	-0.358682	27
TAU	-0.005541***	34	1.078943*	1	0.452170***	1
TI2	0.000139	20	0.767722*	18	-0.141257	19
TI3	0.004336	7	0.732926*	21	-0.499075**	28
TIE	-0.000203	23	0.924008*	9	0.057897	9
TKF	0.002224	13	0.387460*	33	-0.259514	26
TTE	0.008448	2	0.730588*	22	-1.122599**	34
TYH	0.001963	14	0.867760*	12	-0.024111	10
TZD	-0.003303***	32	0.562616*	31	0.212445	3
TZE	-0.000445	26	0.929223*	6	-0.104808	16
TZK	-0.000621	28	0.467132*	32	-0.144850	21
VEF	0.000353	19	0.932790*	4	-0.144325	20
YAS	0.008247**	3	0.753541*	19	-0.688357	30
YAU	0.001675	15	0.888803*	10	-0.198854	22
YEF	0.000111	21	0.936193*	3	-0.043328	11
YHS	0.000954	17	0.789542*	17	0.127764	5

*, **, *** denotes statistical significance at the 1 %, 5 % and 10 % levels, respectively.

According to Quadratic Regression Model, α_p coefficient, which shows the security selection ability of fund managers, is positive for 22 funds in all share mutual funds. However, only 7 funds (ST1, YAS, STH, FYD, ICF, AYA, and EC2 respectively) are found statistically significant (one fund at 1%, three funds at 5%

and three funds at 10% significance level). Therefore, the managers of these 7 funds have security selection ability. Beta coefficients, which show the fund sensitivity to market index, are significant at 1% significance level for all these funds and vary between 1.078943 (TAU) and 0.224624 (STH). (γ_p) coefficient is positive for 9 funds, but only 1 fund (TAU) is statistically significant at 10% level. So, the manager of TAU fund successfully timed to market.

Considered statistically significant results, the most important result achieved is that fund managers do not have security selection ability and timing ability simultaneously.

3.5.2. Results of Dummy Variable Regression Model

In the Quadratic Regression Model developed by Treynor and Mazuy (1966), it is assumed that the portfolio has a different beta value in every changing situation compared to the market's rise and fall, whereas the beta value varies and can only be either one or zero according to the rise and fall of the market in the Dummy Variable Regression model developed by Henriksson and Merton (1981).

Results of the Dummy Variable Regression are presented in Table 21.

Table 21: Results of Dummy Variable Regression Model

Fund Name	Security Selection (α_p)	Rank	Beta (β_p)	Rank	Market Timing (γ_p)	Rank
ADP	-0.003168	33	0.779753*	21	-0.277637*	33
AK3	0.000568	14	0.813766*	17	-0.020238	17
AKU	-0.000186	17	0.930032*	9	-0.006893	12
AYA	0.002661	5	0.902763*	10	-0.049478	20
BZI	-0.000741	19	0.738191*	23	0.108857	4
DAH	-0.001747	29	0.693679*	28	0.047996	6
DZE	-0.000789	20	0.937013*	7	-0.017470	16
EC2	-0.003656*	34	0.614224*	31	-0.152810*	28
FYD	0.005563**	3	0.793525*	18	-0.027920	18
GAE	-0.001282	26	0.947637*	2	0.009642	9
GAF	-0.001819	30	0.718879*	25	0.104020	5
GHS	-0.001127	22	0.844823*	13	-0.117885**	27
HAF	0.001534	8	0.742807*	22	-0.314361*	34
HBU	-0.001185	24	0.947075*	3	-0.046564	19

ICF	0.000863	11	0.632889*	29	-0.006223	11
IGH	-0.001185	23	0.698501*	27	-0.090770	24
IYD	-0.001454	27	0.705093*	26	-0.154791**	29
ST1	0.008117**	1	0.779901*	20	0.233389	1
STH	0.005722	2	0.175970*	34	0.222728	2
TAU	-0.002978	32	1.050412*	1	0.033125	7
TI2	-0.001211	25	0.833475*	14	-0.208891*	31
TI3	0.001353	10	0.780388*	19	-0.092350	25
TIE	-0.000030	15	0.936467*	8	-0.052039	23
TKF	0.000761	12	0.403024*	33	-0.016179	15
TTE	0.001879	6	0.822878*	15	-0.157185	30
TYH	0.001691	7	0.883306*	12	-0.050754	22
TZD	-0.002728	31	0.614287*	30	-0.211747*	32
TZE	-0.001051	21	0.937061*	6	-0.011957	14
TZK	-0.001549	28	0.487448*	32	-0.049649	21
VEF	-0.000418	18	0.937102*	5	0.006173	10
YAS	0.004952**	4	0.734270*	24	0.168604	3
YAU	0.000616	13	0.894312*	11	0.010016	8
YEF	-0.000151	16	0.940591*	4	-0.008987	13
YHS	0.001358	9	0.814582*	16	-0.106263**	26

*, ** denotes statistical significance at the 1 % and 5 % levels, respectively.

According to the results in Table 21, (α_p) coefficient, which shows the security selection ability, is positive for 14 funds but only 3 out of them (ST1, FYD, and YAS) are statistically significant at 5 % significance level. (α_p) is negative for the other 20 funds, but only 1 fund (EC2) is statistically significant at 1 % significance level. Beta is statistically significant for all mutual funds. When the (γ_p) coefficient, which demonstrates the market timing ability of fund managers, value is taken into consideration, it is positive for 10 funds, but none of them is statistically significant.

Results of the Dummy Variable Regression shows that only managers of ST1, YAS, and FYD funds have the security selection ability, but none of them successfully timed the market.

3.6. SUMMARY OF FINDINGS

This study attempted to analyze the mutual fund performance in Turkey for the period from January 2006 and December 2018 by using different performance measurement models. The results based on various methods in the study indicate that the mutual funds which exhibit the best and the worst performance are mostly the

same, only their rankings change. Table 22 and Table 23 depict the 5 funds that have the best and the worst performances and their rankings based on single index models results.

Table 22: The Best Performing Five Share Mutual Funds Based On Single Index Models

Measure Methods/	Sharpe Ratio	M ²	Treynor Ratio	Jensen's Alpha	T ² Measure	Appraisal Ratio	Fama Measure
1 st	STH	STH	STH	ST1	STH	HBU	ST1
2 nd	ST1	ST1	ST1	STH	ST1	TZE	STH
3 rd	FYD	FYD	FYD	FYD	FYD	ST1	FYD
4 th	YAS	YAS	YAS	YAS	YAS	DZE	YAS
5 th	HAF	HAF	HAF	TKF	HAF	BZI	TTE

As seen in Table 22, Share Mutual Funds, which show the best performance, are mostly the same based on all single index models. ST1 and STH mutual funds mostly appear to have the best performance and hence, they share 1st and 2nd places according to Sharpe Ratio, M², Treynor Ratio, T², Jensen's Alpha, and Fama Measure. Nevertheless, the HBU fund is in 1st place and the TZE fund is in 2nd place according to the results of Appraisal Ratio. The fund, which has the best third performance, is FYD according to almost all single index models, whereas ST1 is the best third fund according to Appraisal Ratio. The fund with the fourth-best performance is YAS according to almost all measures. HAF is the fund that shows the fifth best performance according to Sharpe Ratio, M², Treynor ratio and T². Nonetheless, the fifth best performing fund is TKF according to Jensen's Alpha, whereas it is BZI according to Appraisal Ratio and TTE according to Fama Measure.

According to Table 23, the fund that shows the worst performance is EC2 based on Sharpe Ratio, M² and Fama measure. Nonetheless, it is TAU according to Treynor Ratio, T² and Jensen's Alpha, whereas it is VEF based on Appraisal Ratio. As seen in Table 23, although ranking among funds changes, the worst performing funds are mostly the same based on all single index models.

Table 23: The Worst Performing Five Share Mutual Funds Based On Single Index Models

Measure Methods/ Ranking	Sharpe Ratio	M ²	Treynor Ratio	Jensen's Alpha	T ² Measure	Appraisal Ratio	Fama Measure
Fund with worst performance	EC2	EC2	TAU	TAU	TAU	VEF	EC2
Fund with second worst	TZD	TZD	GAE	GAE	GAE	STH	TAU
Fund with third worst performance	TAU	TAU	ADP	ADP	ADP	GAE	ADP
Fund with fourth worst	ADP	ADP	HBU	GAF	HBU	AYA	TZD
Fund with fifth worst performance	TZK	TZK	GAF	HBU	GAF	YAS	GAF

Based on the results of the single index models, the performance ranking of mutual funds vary according to which single index model is used. However, the ranking of mutual funds is mostly the same according to single index performance measurement models that take total risk into account, while the ranking of mutual funds varies greatly according to single index performance measurement models that take systematic risk into account.

Based on the results of the Quadratic Regression Model only 7 funds (ST1, YAS, STH, FYD, ICF, AYA, and EC2 respectively), which have statistically significant and positive α_p coefficients, have the security selection ability. However, none of these seven funds exhibit successful performance in terms of market timing since they do not have statistically significant (γ_p) coefficients. STH, ST1, YAS, and FYD are four out five funds, which have the best performance in terms of the security selection ability according to the single index models, also show similar performance according to the quadratic regression models. In addition, TAU, ADP, TZD, FYD, and YHS are the top five funds that have a positive (γ_p) coefficient in terms of market timing in quadratic regression model; but only TAU has a statistically significant (γ_p) coefficient and hence it exhibits successful performance in terms of market timing. Furthermore, none of the funds have market timing ability and security selection ability simultaneously in the quadratic model. In terms of the dummy variable regression model results, 14 funds have a positive (α_p) coefficient but 3 out of 14 funds (ST1, FYD, and YAS respectively), which have statistically significant (α_p) coefficients, have security selection ability. However, none of these

funds (ST1, FYD, and YAS) has market timing ability since they do not have statistically significant (γ_p) coefficients. Although ST1, STH, FYD, YAS, and AYA are on the top five funds, only ST1, FYD, and YAS have security selection ability since they have statistically significant (α_p) coefficients. On the other hand, ST1, STH, YAS, BZI, and GAF have positive (γ_p) coefficients but none of them has statistically significant (γ_p) coefficients. Therefore, although they are in the top five in terms of timing ability, it can not be argued that they exhibit successful performance in terms of market timing ability. Table 24 depicts the five best performing share mutual funds based on multi index models.

Table 24: The Best Performing Five Share Mutual Funds Based On Multi Index Models

Regression Model/ Ranking	Quadratic Regression Model		Dummy Variable Regression Model	
	Selection Ability	Timing Ability	Selection Ability	Timing Ability
1 st	ST1* (0.012164)	TAU*** (0.452170)	ST1** (0.008117)	ST1 (0,233389)
2 nd	TTE (0,008448)	ADP (0,283506)	STH (0,005722)	STH (0,222728)
3 rd	YAS** (0.008247)	TZD (0,212445)	FYD** (0.005563)	YAS (0,168604)
4 th	STH** (0.007065)	FYD (0,197646)	YAS** (0,004952)	BZI (0,108857)
5 th	FYD*** (0.004560)	YHS (0,127764)	AYA (0,002661)	GAF (0,104020)

*, **, *** denotes statistical significance at the 1 %, 5 %, and 10 % levels, respectively.

Table 25 depicts the five worst performing funds in terms of regression model results. TAU, ADP, TZD, DAH, and IYD are the five funds that exhibit the worst performance respectively and none of them have positive (α_p) coefficients in terms of the quadratic regression model. Hence, none of these five worst performing funds have security selection ability, although TAU and TZD funds have statistically significant (α_p) coefficients. On the other hand, TTE, GAF, ST1, BZI, and YAS have negative (γ_p) coefficients and do not have timing ability in terms of quadratic regression model although (γ_p) coefficients of TTE and GAF are statistically significant. According to the dummy regression results for the five worst performing funds, while EC2, ADP, TAV, TZD, and GAF are the five worst performing funds respectively in terms of the security selection ability, HAF, ADP, TZD, TI2, and

TTE are the five worst performing funds respectively in terms of market timing ability. EC2, HAF, ADP TZD, and TI2 from these funds have statistically significant (α_p) or (γ_p) coefficients, but none of them has neither the security selection ability nor the market timing ability since their coefficients are negative.

Table 25: The Worst Performing Five Share Mutual Funds Based On Multi Index Models

Regression Model/ Ranking	Quadratic Regression Model		Dummy Variable Regression Model	
	Selection Ability	Timing Ability	Selection Ability	Timing Ability
Fund with worst performance	TAU*** (-0.005541)	TTE** (-1.122599)	EC2* (-0.003656)	HAF* (-0.314361)
Fund with second worst performance	ADP (-0.003949)	GAF** (-0.897459)	ADP (-0.003168)	ADP* (-0.277637)
Fund with third worst performance	TZD*** (-0.003303)	ST1 (-0.858845)	TAU (-0.002978)	TZD* (-0.211747)
Fund with fourth worst performance	DAH (-0.002555)	BZI (-0.741787)	TZD (-0.002728)	TI2* (-0.208891)
Fund with fifth worst performance	IYD (-0.001477)	YAS (-0.688357)	GAF (-0.001819)	TTE (-0.157185)

*, **, *** denotes statistical significance at the 1 %, 5 %, and 10 % levels, respectively.

As a result, the empirical findings state that more than half of the funds underperformed the average in all single index models except for only the information ratio. However, while the rankings of mutual funds do not vary according to single index models that take total risk into account, whereas it varies according to single index models that take systematic risk into account. On the other hand, in terms of multi index models, while almost all of the mutual funds were not found to exhibit market timing ability in both regression models, only 7 out of 34 funds show security selection ability according to the quadratic regression model and only 3 out of 34 funds have security selection ability according to the dummy regression model. In addition, none of the funds exhibit the selection and market timing ability simultaneously. Furthermore, although the funds ranked in the top five, which show security selection ability, are mostly the same in terms of both single index models and multi-index models, it is not possible to state this for all funds' ranking. Hence, H1, H3, H4, H5, and H6 hypotheses are rejected but H2 hypothesis cannot be rejected.

CONCLUSION

The risk undertaken in the case of investing in a single security in financial markets is high. In addition, in times when personal savings have not reached sufficient size, the risk of the portfolios, which are formed with these savings, increases as well. The main purpose of investors is to invest their savings in such a way that they generate high returns at the level of low risk. Realizing such returns in financial markets requires knowledge and expertise. Mutual funds present a lot of advantages such as risk distribution and professional management service to their investors as well as investment opportunities with small amounts of savings effectively by pooling them together. Mutual funds investing in portfolios consisting of various securities play an important role especially in transferring small amounts of savings into the capital market. Mutual funds, which protect investors from the risk of investment made on a single security, show differences in international markets and they are classified into various classes according to the structure of the securities in their portfolio. In addition, mutual funds provide opportunities for their investors to invest in the most suitable way to their risk-return preferences at the stage of making an investment decision in which the risk factor is extremely effective.

The number and types of mutual funds have increased over time in order to be able to present suitable alternatives for the preferences of different investors. This development in mutual funds, at the same time, has made it more difficult for investors to choose between alternative funds. While investors or savings owners choose the most suitable funds for their risk and return preferences, they can make better investment decisions if they have information about the performances of these funds. Moreover, since mutual funds form an alternative among other investment instruments for investors who wish to invest their savings, knowing the risk and return characteristics of the mutual funds is of importance. Therefore, the performance evaluation of mutual funds is needed at the decision stage of investment. Performance evaluation is also used to determine how successful fund managers are. The use of methods that are based on risk and return rather than

methods based on return together makes the measurements and evaluations more significant in the evaluation of portfolio performance.

In this study, the aim is to evaluate the performance of share mutual funds operating in Turkey by using various performance measurement models in the period between 2006 and 2018. In doing so, monthly data of 34 share mutual funds for the period from January 2006 and December 2018 are used. The data needed in the analysis consist of the day-end value of the share mutual funds, closing value of BISTKYD-GDS Indices with 91 days and BIST-100 index and are retrieved from FINNET Fund Exper Programme, BIST, and CBTR respectively. In addition, the periods in which dummy variable values are used in the Dummy Regression models were determined by CMAX Approach proposed by Patel and Sarkal (1998). Regression analyses are conducted through EViews 9.0 econometric software.

The empirical results indicate that share mutual funds, which show the best and worst performance, are mostly the same based on all single index models, only the rankings of these funds vary. While the rankings of mutual funds do not vary according to single index models that take total risk into account, it varies according to single index models that take systematic risk into account. In addition to this, more than half of the funds underperformed the average in all single index models except for the Information Ratio. In terms of quadratic regression results, only 22 funds have positive, but 7 out of 22 funds have a statistically significant (α_p) coefficients, hence these 7 funds exhibit security selection ability. At the same time, according to the results of the dummy regression model, only 14 funds have positive, but 3 out of 14 funds have a statistically significant (γ_p) coefficients, hence these 3 funds exhibit security selection ability. On the other hand, the results for market timing ability indicate that 9 funds have a positive (γ_p) coefficient and 10 funds have a (γ_p) positive coefficient in the quadratic regression model and dummy regression model respectively and only 1 fund has a statistically significant (γ_p) coefficient in only quadratic regression model. In addition, none of the funds have the selection and market timing ability simultaneously. Furthermore, although the funds ranked in the top five, which have security selection ability, are mostly the same in terms of both single index models and multi-index models, it is not possible to state this for all funds' ranking. As a result, it may be argued that most of the share mutual funds used

in the study underperformed the average and are not found to be successful in security selection and especially market timing. Moreover, it can be stated that the expected benefit from professionally managed mutual funds is not achieved as expected.

The performance evaluation of mutual funds was studied widely by many researches. To the best of our knowledge, this study is one of the rare studies which examine the performance evaluation of mutual funds after radical changes made in the CMLw and CPIF in Turkey in 2015. For that reason, this study differs from other studies in three ways. First, CMAX crisis indicator, which is not commonly used in literature, is applied to determine the crisis periods that occurred in the BIST-100 index between 2006 and 2018 to apply in the dummy regression model as a dummy variable. Second, the performance of share mutual funds formed according to the new fund classification criteria stated in CPIF after changes in CMLw was tested. In addition, in line with the new CMLw, this study has been conducted by taking some basic regulations realized in mutual funds into account and some basic information was given. Therefore, it is believed that this study will have a significant contribution to the literature on performance evaluation of mutual funds.

For further research, it can be suggested that single index models and multi index models can be implemented by using a data set that includes a longer time period and expanding the study to cover a longer period can enable investors to make more rational decisions in the selection of mutual funds. It is expected that the new regulations implemented in the CMLw after 2015 will have a significant contribution to the Turkish mutual fund sector. In the following years, it is of great importance to investigate whether this contribution has emerged in a way that meets the expectations since the importance of mutual funds in the development of capital markets can be seen clearly in developed countries. The development of capital markets will also have significant contributions to economic development in Turkey.

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