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Determinants of Mutual Fund Performance: Evidence from Turkey

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Abstract

Mutual funds are defined as assets managed by professionals to enable investments by mitigating asymmetric information in the market. Mutual funds, which appeal to investors with little or no financial literacy or those who prefer professional fund management despite their knowledge, have become popular in recent years to transform savings into investment opportunities. The volume of mutual funds is expected to increase further. Understanding the factors affecting mutual funds, the determinants of funds, or the variables related to funds enhances the comprehensibility of this concept. Quantitative analyses ensure the effective use of funds and increase their functionality. This study examines the relationship between mutual funds and BIST 100 in Turkey using data from 07.06.2019 to 02.05.2024. The total value of mutual funds and their returns relative to the BIST 100 returns were used as variables. Panel data analysis was employed, and the relationship was assessed using the Beck-Katz estimator. The results show a significant and positive relationship between the total value of mutual funds and their returns relative to the BIST 100 returns. This finding illustrates the relationship between mutual funds' total value and the BIST 100, a benchmark stock market, during the study period. These results provide quantitative information on mutual funds for investors, sectors, and researchers.

Keywords BIST 100 · Mutual Funds · Beck-Katz Forecaster

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In 1772, the bankruptcy of UK-based banks due to financial difficulties caused by a significant decrease in the shares of the East India Company, one of the world's most important companies at that time, rapidly spread to Scotland and then to continental Europe in a domino effect. As the effects of this event, known as the financial crisis of 1772, reached the Netherlands, Dutch merchant Abraham van Ketwich established the "Eendragt Maakt Magt" foundation in 1774 to invest in Austria, Denmark, and Germany by pooling small investors' resources and distributing risk. This first initiative, considered a historical mutual fund, emerged in Amsterdam, which had a highly developed capital market at the time, providing a significant advantage (Rouwenhorst, 2004). During this period, the number of securities traded on the Amsterdam Stock Exchange exceeded one hundred. Additionally, a biweekly publication shared information with the public by announcing changes in security prices, dividend distributions, and new public offerings. The establishment of the first mutual fund in such a transparent market helps prevent investor confidence issues (Neal, 1993).

Subsequently, this successful model gained popularity in Europe during the late 1700s and the 1800s, with examples appearing in the United States in the 1890s. The first American closed-end mutual fund was established in 1893 as the "Boston Personal Property Trust." In the following periods, one of the most significant obstacles to the rapid development of the mutual fund market was eliminated by allowing investors to withdraw their money from the fund at any time (Lofton, 2007). The first fund that can be considered a modern mutual fund today was the "Massachusetts Investors' Trust," established in Boston in 1924. Established as an open-ended fund, it achieved great success quickly, increasing its assets by 500 percent within one year. In 1928, the public offering of this fund earned the title of the first publicly traded fund (Robertson, 2001).

From the perspective of the United States, the economic depression that grew after the crisis started in the securities markets in 1929 caused the development process of mutual funds to remain limited for long periods. The establishment of the Securities and Exchange Commission (SEC) and the Securities Exchange Act (SEA) after the crisis mitigated the unfavourable situation for mutual funds. In 1940, the Investment Company Act (ICA) represented the most significant change in realising mutual funds' market potential.

Between 1930 and 1970, mutual funds experienced relatively low growth rates. However, equity mutual funds reflected the rise in equity markets in the early and the mid-1960s. This trend was reversed after the 1973 OPEC oil crisis and poor stock market performance (Fernando et al. 2003). Additionally, during this period, Wells Fargo established the first index-based investment fund in 1971 (Bogle, 2016).

The significant rise in the markets that began in the 1980s and continued throughout the 1990s made mutual funds very popular among all investors. Many successful fund managers emerged during this period, gaining worldwide recognition and pioneering the growth of the sector.

Globally, the mutual fund sector's asset size reached USD 67.48 trillion by the end of 2022. Moreover, the sector is estimated to reach approximately USD 145.24 trillion by 2030, with a compound annual growth rate of approximately 10.06% between 2023 and 2030 (Mutual Fund Assets Market, 2024).

When evaluating the development process of mutual funds in Turkey, it was observed that, similar to the global transformation process, the liberalisation trend that accelerated since the 1980s also affected Turkish capital markets (Haydaroğlu & Tatlısu, 2016). The decisions of January 24, 1980, known as the January 1980 Decisions, initiated economic stability programs including structural transformations (Altinkemer & Ekinci, 1992), and the effects of liberalisation gradually increased with Capital Market Law No. 2499 enacted in 1981. In 1986, the establishment of the Istanbul Stock Exchange and the expansion of capital markets in Turkey

during the 1990s increased foreign investors' inflows to the country. Individual and institutional investors demand mutual funds owing to the advantages of risk distribution and professional fund management. However, the requirement to open an account with the relevant asset management company for each mutual fund that investors wanted to become shareholders poses a significant obstacle to the sector's development. In 2015, Takasbank launched the Turkish Electronic Fund Trading Platform (TEFAS), enabling investors to access all funds on a single platform and invest in all traded funds. Owing to the TEFAS platform, investors' transparent access to all mutual funds increased competition among funds, and technological infrastructure rapidly increased trading volume. As shown in Table 1, the total trading volume of mutual funds has exhibited a continuous upward trend since the establishment of the TEFAS.

Table 1

Investment Funds

Term	Total Transaction Volume (TL)	Daily Average Volume (TL)	Net Clearing Amount (TL)
2015	13.608.695.755	53.789.311	3.889.544.338
2016	21.578.394.355	85.969.699	4.479.357.992
2017	25.530.275.368	100.910.179	5.385.175.789
2018	27.438.663.411	109.317.384	6.422.880.779
2019	52.157.696.233	209.468.660	15.601.016.603
2020	166.102.777.795	659.138.007	40.186.267.392
2021	233.004.192.566	935.759.810	58.389.892.873
2022	483.345.810.198	1.918.038.929	120.167.472.857
2023	1.858.445.822.938	7.345.635.664	455.746.074.973
2024-6	2.158.740.662.407	20.175.146.378	479.901.971.791

Source: (TEFAS, 2024)

When analysing the most profitable mutual funds over the 5-year period as of June 2024, Figure 1 shows that the equity umbrella fund yields more profit than the other funds. Following the equity fund are the variable and precious metals funds. These funds are significant in terms of investors' perception of the expected return.

Figure 1

The Most Profitable Mutual Funds
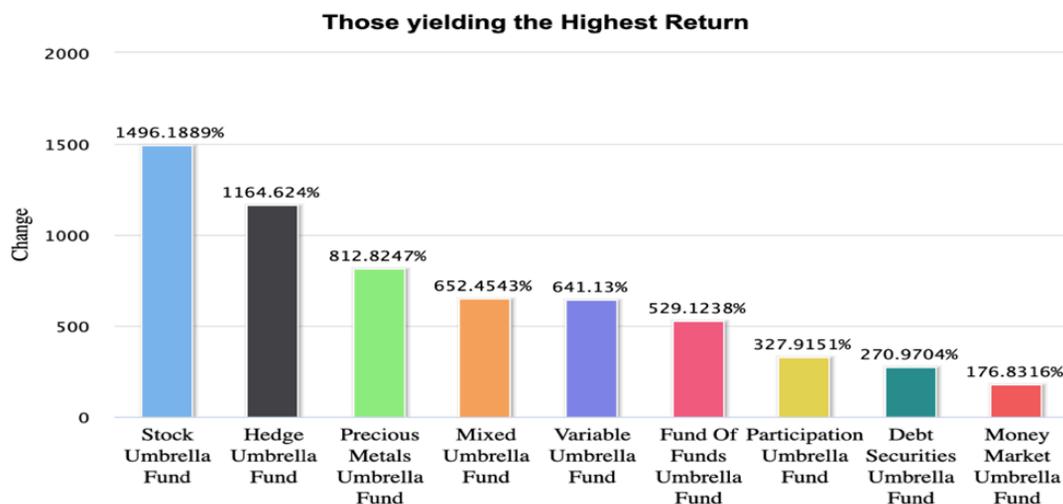
Source: (TEFAS, 2024)

Literature Review

Mutual funds are investment instruments in which professionals manage assets that consist of money and capital market instruments. Mutual funds can consist of different assets, which is a good alternative for units with low financial knowledge who want to use their savings with investment opportunities. Mutual funds are important for adjusting the risk and return levels. Although there are various theories about the level of risk in the literature, it has been stated that the level of risk differs among individuals. The literature also states that risk-taking behaviour shapes the characteristics of mutual funds. Many studies on mutual funds have been conducted in the literature, and related funds have been analysed using various methods. Performance-oriented studies of related instruments are presented below.

Indro et al. (1999), arguing that fund size affects mutual fund performance, obtained a sample of 683 United States (US) equity funds between 1993 and 1995. The results showed that 20% of mutual funds were smaller than the break-even cost fund size, 10% of the largest funds were overinvested in information acquisition and trading, and value and mixed funds gained more from these information activities than growth funds. Yıldız (2006) analysed the Turkish variable equity and mixed fund performance from 2001 to 2003. In addition to performance evaluation, this study argues that Turkish mutual funds should increase their fund size to benefit from a cost advantage. Cao et al. (2008) analysed the relationship between total mutual fund flows and market volatility in the 1998-2003 period, using the VAR approach and found a negative relationship. In addition, the implications for intraday volatility are presented in this study. Ferreira et al. (2013) conducted a study to determine the determinants of mutual fund performance in 27 countries. Within the scope of this study, it is stated that performance determinants vary in the USA and other countries. Consequently, it is argued that funds in countries with liquid stock markets and strong legal institutions perform better.

In the study conducted by Adan (2013) on the determinants of mutual fund performance, it is stated that mutual funds are an important opportunity for units that need more financial information. This study, which uses data from 2008 to 2012, states that the performance determinants of mutual funds in Kenya are risk, transaction cost, size, and country characteristics. In the study conducted by Aydoğan et al. (2014), which analyses the long and short-term relationships between mutual funds and stocks, it was found that there is a long-run relationship between all types of mutual funds and stock returns and bidirectional causality in the short run. Akel (2016) evaluated the performance of Type A and Type B mutual funds and found that Type A fund managers do not have selectivity and market timing capabilities. Related funds do not have relative and absolute performance continuity in the short term. For Type B fund managers, they have selectivity ability, and both relative and absolute performance continuity are detected in both periods. Kaur (2018), in an examination of the 2004-2013 periods of Indian equity market mutual funds, states that investors who want to maximise their returns seek criteria related to funds for preference. As a result of the analyses conducted within the scope of the study, it was found that characteristics such as fund size, expense ratio, portfolio turnover ratio, and age affect mutual funds' trading strategy. In addition, investors were provided with quantitative inferences.

İpekten et al. (2020) examined the performance of 30 Type A mutual funds in Turkey between January 2013 and December 2017. They quantitatively measured the performance of mutual funds, such as gold funds and variable funds, using indices to inform investors and determine the success of portfolio managers. In the study conducted by Uygurtürk and Bal (2020), the performance of pension and securities mutual funds was measured using the Grey Relational, performance ranking was performed, and inferences were made. Oğuz (2020) analysed the causality relationship between the stock weight in the total portfolios of mutual funds and the stock market index and concluded that there is no causality relationship.

Another study on the factors that determine the performance of mutual funds was conducted by Mahar et al. (2021). This study determines the factors that affect the performance of mutual funds. The study found that fund size, turnover, and management effectiveness were the most important determinants of mutual funds. Additionally, recommendations were made within the scope of this study. In one of the most recent studies, Zhao et al. (2024) argued that the risk-taking of mutual funds varies according to conditions. This situation depends on the transaction costs and risk premiums. Evidence from the US and China is presented within the scope of this study, and risk-taking behaviours are quantitatively examined.

A general review of the literature reveals that various analyses have been conducted on the performance, causality, and relationship detection of mutual funds. When studies on performance determinants and relationship detection are analysed, the characteristics of mutual funds differ from country to country. Some performance determinants are fund size, transaction cost, liquidity, financial institutions, information level, country characteristics, risk, financial ratios, and management. It is stated that when countries differ, the level of risk also differs. In this study, the performance of mutual funds in Turkey was evaluated using current data, and the relationship with the BIST 100, a benchmark stock market, was determined. The relationship with the index is important in explaining the characteristics of mutual funds. This study was original in terms of the period, variables, and methodology used. Determining the relationships during this period, which covers the pandemic, inflationary environment, and policy changes, will guide investors and researchers in the future.

Methodology and Findings

This study investigates the effect of the change in the total value of mutual funds on their returns relative to the BIST 100. The dependent variable in the model established in line with this research question is fund returns relative to BIST 100 returns (Fund ReturnBIST100). In contrast, the independent variable is the natural logarithm of the fund's total value (lnFundTotalValue). Because the return relative to BIST 100 is taken as the basis, the study's dataset is based on 115 equity-intensive mutual fund data between 07.06.2019 and 02.05.2024. Because the dataset consists of both time and unit sizes, panel data analysis methods were applied in this study. The descriptive statistics of the variables used in the model are presented in Table 2.

Table 2

Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
FundReturnBIST100	98.182	0,0006	0,309	–1,04	95,721
lnFundTotalValue	98.182	18,1309	2,818	0	23,503

When the descriptive statistics are analysed, the total number of observations of the variables in the model is 98,182. The mean of the dependent variable Fund ReturnBIST100 is 0.0006, the standard deviation is 0.309, the minimum value is –1.04, and the maximum value is 95.721. When the descriptive statistics values of the independent variable lnFundTotalValue are analysed, it is seen that its mean is 18.1309, the standard deviation is 2.818, the minimum value is 0, and the maximum value is 23.503.

After the descriptive statistics of the variables are provided, a stationarity test is performed to determine whether these variables are suitable for panel data analysis. To decide on the unit root test to be used in the stationarity test, Pesaran's (2004) CD test is used to test whether the variables are correlated between units. The following equation performs the Pesaran (2004) CD test for balanced panels (Yerdelen Tatoğlu, 2020a).

$$CD = \sqrt{\frac{2T}{N(N-1)}} \left(\sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij} \right) \tag{1}$$

Pesaran (2004) CD test results are presented in Table 3.

Table 3

CD Test Results

Variable Name	CD Test	p-value	Corr	Abs (Corr)
FundReturnBIST100	1076,5	0,000	0,485	0,522
lnFundTotalValue	1351,24	0,000	0,670	0,724

When the CD test results of the variables are analysed, the test hypothesis is rejected for both variables, and it is concluded that there is an inter-unit correlation. The average correlation coefficient for the dependent variable was 0.485, and the average correlation coefficient for the independent variable was 0.670. Since both variables are correlated with units, second-generation unit root tests should be preferred to test the stationarity of both variables. For this reason, the stationarity test of the variables was performed using the Fisher Philips Perron (Fisher PP) Panel Unit Root test. The test results are presented in Table 4.

Table 4

Stationarity Test

			Statistic	p-Value
FundReturnBIST100	Inverse chi-squared(230)	P	7918.7253	0.0000
	Inverse normal	Z	−84.1390	0.0000
	Inverse logit t(574)	L*	−204.3978	0.0000
	Modified inv. chi-squared	Pm	358.4887	0.0000
lnFundTotalValue	Inverse chi-squared(230)	P	2069.7423	0.0000
	Inverse normal	Z	−23.1754	0.0000
	Inverse logit t(579)	L*	−49.1010	0.0000
	Modified inv. chi-squared	Pm	85.7784	0.0000

When the test results are analysed, it is concluded that both variables are stationary. After this stage, the assumption tests required for model estimation were started. Several assumption tests were performed to determine the most appropriate estimator for estimating the model. First, the Swamy S (1971) test was conducted to determine whether the model was a homogeneous or heterogeneous panel data model. The relevant test is performed using the equation below (Yerdelen Tatoğlu, 2020b).

$$\hat{S} = \chi^2_{k(N-1)} = \sum_{i=1}^{N} \left(\hat{\beta}_i - \overline{\beta}^* \right)' \hat{V}_i^{-1} (\hat{\beta}_i - \overline{\beta}^*) \tag{2}$$

The results of the Swamy's S test are presented in Table 5.

Table 5

Swamy S Test

Test Statistic	Probability Value
chi2(228) = 84.18	1.0000

The results show that the test hypothesis cannot be rejected. The model is a homogeneous panel data model. The presence of a unit effect in this model is tested using the F test. The test results are presented in Table 6.

Table 6

F Test Results

Test Statistic	Probability Value
F (114, 98066) = 0.74	Prob > F = 0.9840

According to the test results, the test hypothesis cannot be rejected and there is no unit effect in the model. The classic model is suitable for the model estimation. Then, the presence of heteroskedasticity is tested by the Breusch-Pagan/Cook-Weisberg test, the presence of autocorrelation is tested by the Wooldridge test, and the correlation between units is tested by the Pesaran test. The test results are presented in Table 7.

Table 7

Assumption Tests

Test Name	Test Statistic	Probability Value
Breusch-Pagan/Cook-Weisberg test	2954,65	0.000
Wooldridge test	1,428	0.2346
Pesaran Test	1077,965	0,000

The test results indicate that the model has heteroskedasticity and inter-unit correlation but no autocorrelation. According to this result, the model is suitable for estimation using the Beck-Katz estimator. Beck-Katz's (1995) estimator is estimated using the least squares method. In the next stage, the correct estimates of the standard errors of β are estimated using the Panel Corrected Standard Errors. In the last stage, the panel-corrected standard errors were obtained using the correction methods. The model's equations are given below (Yerdelen Tatoğlu, 2020c).

Organisation of residuals by clusters to obtain standard errors:

$$U = [\hat{u}_1 \quad \hat{u}_2 \ ... \ \hat{u}_{N-1} \quad \hat{u}_N] \tag{3}$$

β's *panel adjusted the variance-covariance matrix:*

$$Var\,(\hat{\beta})^{PCSE} = (X'X)^{-1}\,X'\hat{V}X(X'X)^{-1} \tag{4}$$

Ω *matrix:*

$$\hat{\Omega} = \frac{E'E}{T} \bigotimes I \tag{5}$$

The estimator of the residual variance for the first cluster:

$$\hat{\sigma}_1^2 = \frac{1}{T}\{\hat{e}_{11}^2 + \hat{e}_{12}^2 + ... + \hat{e}_{1T}^2\} \tag{6}$$

The Beck-Katz estimator results are presented in Table 8.

Table 8

Beck-Katz Results

FundReturnBIST100	Coefficient	Panel Corrected std. Err.	z	P>z
lnFundTotalValue	0.0014958	0.0000878	17.04	0.000
_cons	−0.026464	0.0015608	−16.95	0.000

When the estimation results are analysed, it is found that both the lnFonTotalValue variable and the constant term are significant, the coefficient of lnFonTotalValue is (0.0014958), and the constant term is (-0.026464). According to this result, it is concluded that a one-unit increase in lnFonTotalValue leads to a (0.0014958) unit increase in Fund Return BIST100.

Limitations And Recommendations

This study was conducted in the Turkish financial markets. The variables used are the total value of mutual funds and fund return relative to the BIST 100 return. In this respect, the results of this study are valid for the Turkish market. The fact that the study, including the dataset, is conducted for a specific country market can be stated as a limitation. It is possible to use the results obtained in this study for comparison in future studies. In future studies, it is recommended that analyses be conducted for different markets. Studies should be conducted to distinguish between weak, semi-strong, and strong form-efficient markets, and the findings obtained should be interpreted from this perspective. In addition, certain comparisons can be made regarding the datasets in future studies. This study, which is also important for mutual fund managers, provides information for policymakers. The findings, which will be positively evaluated regarding mutual fund performance, are also instructive for investors who will turn to mutual funds. The fact that there are limited studies on mutual funds in the literature supports analyses with different variables regarding the related concept.

Conclusion

The financial markets include buyers, sellers, assets, funds, institutions, and legal regulations. These environments, where savings are used through investment opportunities, are classified from various perspectives. Based on their maturity, the markets are divided into money and capital markets. In money markets, the maturity is shorter than one year, whereas in capital markets, the maturity is longer than one year. While transactions in organised markets are standard, those in unorganised markets are more flexible. In spot markets, transactions are realised instantly, whereas in futures markets, transactions are made in the future with the price determined today. The distinction between the primary and secondary markets is related to the initial purchase and sale of assets. Fama (1970) categorised financial markets into three types, weak, semi-strong, and strong form efficient, which were introduced to the literature. The related types are important in terms of generating returns.

Investment opportunities can be realised in any immovable asset or an asset such as a stock or a bond traded in financial markets. The trading of related assets is related to individuals' risk perceptions, personality traits, and expectations for the future. In the article entitled "Portfolio Selection," which was introduced to the literature by Markowitz (1952), the importance of diversification and determining the relationships between assets to obtain the expected return is mentioned. In this respect, mutual funds, which have principles such as risk diversification for converting savings into investment opportunities, are the subject of this study.

Within the scope of this study, the effect of the change in the total value of mutual funds on fund returns relative to the BIST 100 return was analysed. To apply the analysis to a broad framework, data from 115 mutual funds between 07.06.2019 and 02.05.2024 were obtained. Panel data analysis was carried out on the relevant data and the Beck-Katz estimator was used. As a result of the study, a significant relationship was found between the two variables. When the estimator results are evaluated, it is determined that a one-unit increase in the fund's total value provides a 0.0014958 unit increase in fund returns compared to the BIST 100 return. This finding provides information about the functioning of mutual funds, and the positive and significant relationship is important in determining the relationship with the BIST 100, a benchmark stock market.

When the studies on mutual funds are evaluated in general, it is stated that it is important to determine the relationship between the related variable and the assets in the markets, such as causality, volatility, and performance. In this study, the relationship between mutual funds and the BIST 100 determines the

direction and severity. This study, which contributes to the literature on the conceptual framework of mutual funds and quantitatively compares them with indicators, is also important in providing researchers with different perspectives.

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