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# Providing Appropriate Investing Level to Make Sector Funds

**Shams Gharneh Naser and Shahlaei Shahabeddin**
Department of Industrial Engineering and Management Systems, Amir Kabir University of Technology, IRAN

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## Abstract

*This research paper deals with an accurate quantitative definition for sector funds. This concept has not met the attention that it deserves yet and authors usually present it two-sided in the literature. This research is looking for a certain percentage on which if a mutual fund invests on one specific sector above that percentage, based on history data, the mutual fund will be considered as the sector fund. We categorize the funds into two groups: sector funds and other funds. Consider each fund in each group as an asset with unique return and risk, and for each group makes fund of funds by Markowitz. We propose to compare the average ratio of risk to return between two made funds based on the primary six months of studied period in order to find the certain percentage. In order to verify the validation, the average ratio of risk to return between two made funds based on the last six months of studied period are compared. The results show that the certain percentage is accurate.*

**Keywords:** Mutual funds, diversification, sector funds.

## Introduction

Mutual fund is a financial instrument which has attracted great attention among investors in the recent two decades. So, for many investors in the modern financial markets, investing on the stock market is using as investing on mutual funds. Accordingly, mutual fund is formed as a useful tool for investing on securities, in different ways and forms. Based on recent advances of financial markets and instruments in Iran, mutual fund is a necessary tool to reach to a successful investment. Several mutual funds are active in Iran's capital market currently. In theory, investing on mutual funds is justifiable and recommended by experts, but in practice it should be done in line with the theory and recovery of mechanisms.

Mutual fund is made by huge investment of monies collected from many investors in securities including stocks, money market instruments, bonds, and similar credits. Mutual funds managers try to manage the fund with investing the monies in a way that result in capital growth and revenue for the investors[1]. Portfolio of these funds are made and kept based on objectives stated in its charter[2]. In other words, mutual funds can be considered as a company where different people put together their own money and sum up the capital in order to invest on a portfolio of securities using experts' suggestions. Therefore, people invest on a mutual fund with a variety of securities rather than invest on a particular stock or bonds, with fewer transactions, and without complicated analysis.

In order to define a sector fund, consider a mutual fund that its investments concentrate on a single sector of the market, or industry. In other words, consider the market that is focused on the same line of business as a whole and a sector is a slice of it. This type of investing result in less diversity in their investment portfolios[3].

Antiquity and validation of investing rules which motivate investors to diversify the investment portfolio are causes for lack of extensive research on the sector funds. We believe that section funds have not met the attention that it deserves yet and authors usually present it two-sided in the literature. In addition, since none of the mutual funds in Iran financial markets is a sector fund officially and consciously, and no research has been done to present the benefits of this type of fund, motivated us to study on section fund.

Fitzpatrick et al. have compared the specialty funds and general mutual funds by examining risk, return and diversification of sector funds and general global mutual funds[4]. They also have concluded socially responsible investment (SRI) Funds. They have found that Sector Funds have much greater risk to return ratio than General Global Mutual Funds. This comparison has been made in thriving markets and in many different periods. Comparing of sector funds and other funds has been done by using data from many different periods and similar results were obtained at different time periods, which make validation and testing the results strong.

On the other hand, in order to determine a mutual fund as sector fund, authors[3] have considered the investing level in industries above 20%, which is a personal decision. In addition, sector funds are separated from other funds with only the risk to return ratio factor. These two characteristics make the conclusion unreliable.

Howe and Pope, have studied the risk, return, and diversification of Specialty Mutual Funds, by examining risk, return and diversification of both sector funds and diversified funds[5]. They have found that investing on sector funds causes much greater risk and return, especially unsystematic risk. Authors showed that increased risk in sector funds is an unsystematic one which was expected because of reducing diversification of a portfolio. They also did not provide an accurate and quantitative definition of investing level in industries to make sector fund. Additionally, comparing between sector funds and other funds have been done with simple and primary definitions which are presented in management science rather than engineering.

In order to enhance the performance of fund of funds portfolios, Larsen and Resnick have proposed an optimization strategy and policy[6]. They have used sector funds to make fund of funds then by applying optimization techniques, the performance of made fund is increased. They have introduced a different approach to evaluate and improve portfolio that its main idea is making fund of funds. On the other hand, the main objective of these researches was to provide an optimization strategy and paying too much attention to the complexity of the model makes us far from our main objective in their study[7].

As mentioned before, this research is trying to apply strengths and eliminate weaknesses in all of existing literature. Therefore, firstly a number is defined as the investing level in industries to determine sector funds which divides mutual funds in statistical society into two groups: sector funds and other funds or non-sector funds. In next step, in order to compare the performance of these two groups, each fund in each group is considered as an asset with unique return and risk, and for each group makes fund of funds by basic mathematical models in optimization. Next, the performance difference of two main made funds of sector funds and other funds is maximized by changing the primary definition of sector funds and provides appropriate investing level in industries to make sector funds, which will be a number between 0 and 100. Finally, it will be tested obtained results by changing the period of data.

It is worth to mention that in making fund of funds, from the point of view of an investor, the best combination of funds in each group will be made. But in determining the appropriate investing level in industries to make sector funds, with the point of view of a mutual fund manager who want to build a sector fund or transform his current fund to a sector fund, and according to existing data, appropriate level for investing in a specific industry is suggested.

The remainder of the paper is organized as follows: Section 2 introduces a general definition of the problem. Section 3 discusses about the empirical methodology and data experiments. The results are presented in Section 4 and finally the conclusions of findings of the study are presented in section 4.

## Problem Definition

Although appropriate diversification is one of the most important features of mutual funds, nowadays we are faced with funds with more focusing on one industry and consequently decrease costs and increase the risk. This offers higher returns to the customers. In fact, too much diversification in portfolio causes not much better performance of mutual funds compared to market and the lack of trust and willingness of costumers to invest on those funds. Therefore, many fund managers are looking for a solution for this problem. To do this, sector funds are new financial instruments which are available for financial active sectors which are focusing on one industry and follow specific goals and plans to resolve the mentioned problems. Sector funds have been found their position as a suitable financial instrument by setting their purposes and functions in countries with advanced financial systems. On the other hand, existence of old sayings in world financial markets such as, “Do not put all your eggs in one basket” causes lack of understanding the purposes and function of this type of mutual funds, lack of financial researcher studies, resistance and distrust in active financial sectors toward this type of mutual funds.

Unfortunately, none of the mutual funds in Iran financial markets is sector fund officially and consciously. In addition, no research has been done to study the benefits of this type of funds. This paper seeks the benefits of this type of funds and studies the active mutual funds of Iran in term of being sector fund. Finally, appropriate investing level to make sector fund is provided.

## Data Experiment

The Statistical Society of this paper is consisted of all active mutual funds in Iran financial market which includes about 100 mutual funds. Their information will be accessible through valid resources. Financial Information Processing Center of Iran, depends on Tehran Securities Exchange Technology Management Co. is the only resource that provides historical data relating to the active mutual funds in the Iran financial markets which is applicable for researchers of this field. Therefore, the net asset value and investing percentages in industries, as defined by the Stock Exchange, in the portfolio of active mutual funds were collected from the period of January 2012 to January 2013. Data has been surveyed and prepared, then active mutual funds of Iran in term of being sector fund has been studied. Optimizing what is expected from sector funds, and determining appropriate investing level to make sector fund, are coded by Matlab[8].

Before entering the data processing section, those funds with missing information about net asset value or investing percentage in industries, were excluded of statistical society.

## Results

In first step, active mutual funds in Iran financial market in term of being sector funds are needed to be studied. In other words, determining each mutual fund whether is a sector fund or not. As mentioned before, an accurate quantitative definition for sector funds has not yet been presented in the literature. On the other hand, active mutual funds in Iran financial markets are committed to invest on stocks of a particular industry a maximum of 30% of capital funds, according to the rules of the association. So all the numbers from 0 to 30 can be considered as the initial choice for defining whether or not a mutual fund is a sector fund. For example, by considering 20 number for defining sector funds, mutual funds which invest 20 or more percentage of their capital in one industry are named as sector fund and other mutual funds are named other funds or non-sector funds.

In second step, in order to compare the performance of two created groups, each fund in each group is considered as an asset with unique return and risk, and for each group makes fund of funds by Markowitz. Markowitz is known as an efficient set is a mathematical model to optimize portfolios that for specific risks, invests in assets so that the return of investment portfolio becomes maximum[9]. Efficient frontier curve can be drawn using these couple of points[10]. Efficient frontier is a curve in modern portfolio theory which is applied to examine a relationship between risk and return on investment portfolio and the portfolios. On each point of this curve maximum possible return with combination of assets, for a specific risk is provided[11]. So, every time we consider a number to determine being sector fund or not in each group, we made a fund of funds and draw the efficient frontier for both groups. After drawing efficient frontier curve for each group, risk to return ratio in eleven points of efficient frontier is calculated. These two groups are compared by considering the average of these ratios as a criterion. In fact, the criterion of funds made by mutual funds in each group is the average of coefficient of variation of the points in efficient frontier of group. It is worth to mention that in making fund of funds, with the view point of an investor, the best combination of funds in each group will be made.

As expected, and according to what was stated in the literature review, results show that although the risk of sector funds group is more than non-sector funds group, the ratio of risk to return in sector funds is less than non-sector funds because of the much higher returns of sector funds rather than non-sector funds. In fact, sector funds with less diversification have more risks, but this less diversification causes more accurate focus and analysis, and cost reduction, and as a result, more rate of returns. This characteristic of sector funds motivates risk-taking investors to invest on them and make them attractive. In order to illustrate this, assume that the number 20 percent was considered for definition of being sector fund and a fund of funds of each group was made, efficient frontier for both groups are shown in figure-1.

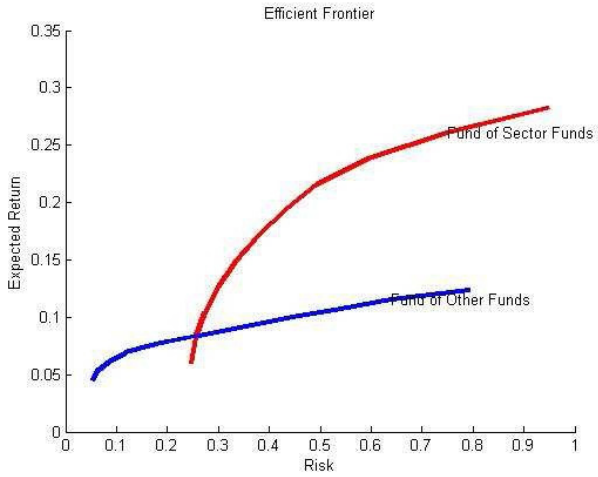


**Figure-1**
**Efficient frontier diagram for funds made by sector funds and other funds**

According to what was stated, sector funds with less diversification, have more risk, but suggest far more returns to their investors.

In third step, based on the primary six months of the studied period, we considered all numbers between 0 and 30 as a definition for being sector fund or not. For each number, we compared funds made by existing funds in each group through the criterion which is mentioned. Based on the primary six months of studied period, the results show that 16 percent number caused the maximum different between fund of sector funds and fund of other funds. It is worth to mention that in making fund of funds with the point of view of an investor, the best combination of funds in each group will be made. But in determining the appropriate investing amount in industries to make sector funds, with the point of view of a mutual fund manager who want to build a sector fund or transform the current fund to a sector fund, appropriate level for investing in specific industry is suggested, and according to existing data.

In fourth step, in order to verify the obtained results in the previous steps, all of mentioned steps have been done, based on the last six months of the studied period. Based on the last six months of the studied period, the results also show 16 percent number caused the maximum different between fund of sector funds and fund of other funds. It can be inferred that obtained number in previous step is valid. Therefore, based on the statistical society of this research, 16 percent is suggested as appropriate investing level in industries to make sector funds.

Obtained results with considering 16 percent number as definition for the level of being sector fund or not, based on the primary and last six months of the studied period, in summary are shown in table-1.

**Table 1**
**Daily return percentage, risk, and ratio of risk to return for funds made by sector funds and non-sector funds, based on the primary and last six months of studied period**

| | primary six months of studied period | | | last six months of studied period | | |
|---|---|---|---|---|---|---|
| | **Daily Return Percentage** | **Risk** | **Risk to Return Ratio** | **Daily Return Percentage** | **Risk** | **Risk to Return Ratio** |
| Funds Made by Sector Funds | 0.05 | 0.22 | 4.55 | 0.06 | 0.22 | 3.73 |
| | 0.07 | 0.23 | 3.19 | 0.08 | 0.23 | 2.79 |
| | 0.09 | 0.25 | 2.62 | 0.11 | 0.25 | 2.40 |
| | 0.12 | 0.28 | 2.35 | 0.13 | 0.29 | 2.21 |
| | 0.14 | 0.32 | 2.22 | 0.15 | 0.32 | 2.11 |
| | 0.17 | 0.36 | 2.20 | 0.18 | 0.36 | 2.05 |
| | 0.19 | 0.42 | 2.22 | 0.20 | 0.41 | 2.05 |
| | 0.21 | 0.48 | 2.28 | 0.22 | 0.47 | 2.09 |
| | 0.24 | 0.58 | 2.46 | 0.25 | 0.56 | 2.25 |
| | 0.26 | 0.74 | 2.85 | 0.27 | 0.73 | 2.68 |
| | 0.28 | 0.95 | 3.35 | 0.30 | 1.03 | 3.48 |
| Average | 0.17 | 0.44 | 2.75 | 0.18 | 0.44 | 2.53 |
| Funds Made by non-Sector Funds | 0.05 | 0.05 | 1.18 | 0.05 | 0.05 | 1.06 |
| | 0.05 | 0.06 | 1.17 | 0.05 | 0.06 | 1.15 |
| | 0.06 | 0.08 | 1.38 | 0.06 | 0.09 | 1.49 |
| | 0.07 | 0.11 | 1.64 | 0.07 | 0.13 | 1.83 |
| | 0.07 | 0.14 | 1.97 | 0.08 | 0.19 | 2.45 |
| | 0.08 | 0.25 | 3.09 | 0.09 | 0.29 | 3.32 |
| | 0.09 | 0.38 | 4.36 | 0.09 | 0.39 | 4.15 |
| | 0.09 | 0.51 | 5.52 | 0.10 | 0.50 | 4.88 |
| | 0.10 | 0.65 | 6.54 | 0.11 | 0.62 | 5.66 |
| | 0.11 | 0.79 | 7.44 | 0.12 | 0.76 | 6.42 |
| | 0.11 | 0.94 | 8.25 | 0.13 | 0.90 | 7.15 |
| Average | 0.08 | 0.36 | 3.87 | 0.09 | 0.36 | 3.60 |

## Conclusions

The study explores an accurate quantitative definition for sector funds. a certain percentage on which if a mutual fund invests on one specific sector above that percentage, based on history data, the mutual fund will be considered as the sector fund. Two categories of funds are studied in Iran Markets. In order to conclude the sector funds and other funds, the average ratio of risk to return between two made funds based on the primary six months of studied period is compared, the certain percentage is found. In order to verify the validation, the average ratio of risk to return between two made funds based on the last six months of studied period are compared. The results show that the certain percentage is accurate.

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