



Opinion

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A Layman's Strategy of Investing in Ordinary Mutual Funds

Caleb Dai¹, David Dai² and Dongfeng Wu^{3*}

¹Department of Statistics, Purdue University, USA

²Department of Finance, University of Louisville, USA

³Department of Bioinformatics and Biostatistics, University of Louisville, USA

*Corresponding author: Wu Dongfeng, Department of Bioinformatics and Biostatistics, School of Public Health and Information Sciences, University of Louisville, USA.

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Opinion

If you read the news recently, tariffs are on top coverage and bring quite some stress in the stock market: the SP 500, the Nasdaq, and the Dow Jones index have been going down quite a bit and then going up a little and then going down again, like a yo-yo. We need a strategy to be a savvy investor in this environment and any environment, so we have developed a simple statistical method to help decision-making in buying and selling ordinary mutual funds. Based on Statistics, 95% of the actively managed mutual funds cannot beat the market in terms of annual returns in the long run [1]. So, there are many popular index funds [2]. And we are taught to use the dollar-cost averaging method to buy mutual funds, especially index funds: simply put aside a certain amount of money and buy on the same day of each month and ignore the market fluctuation [3]. However, a good question is: could we develop a strategy that improves the return in the long term for the ordinary mutual funds, including the index funds? We have studied this topic for a while and have developed a general strategy or guideline for buying and selling, and based on our practice in the past few years, we think it works well.

First, we would separate mutual funds into three categories: good, bad, and ugly. In this article, we focus on the "bad" funds. We call them "bad" because their prices are very stable, that is, the funds' prices only slowly drift upwards over 10 years. About 80% of mutual funds fall into this category, except a few star index funds that track the S&P 500 or the Nasdaq index. Therefore, we can also call these ordinary mutual funds. We will use the Fidelity

Select Biotechnology Portfolio (FBIOX) as an example to illustrate our strategy. We will carry out some basic data analysis to address the question: When is a good time to buy? And when is a good time to sell? FBIOX is not a star fund; in the most recent 10 years, it only had a positive return in five years, with another five years of negative return. But we can apply our simple strategy to this fund, such that with high probability, we can have a better return than the fund itself, especially in the long term. Similarly, we can apply this strategy to invest in other mediocre funds and still have a good return. And our method is especially useful in specialty funds based on different sectors, such as FBIOX, FSPHX (Healthcare), FSAGX (precious metal), FSENX (oil and gas), FSRBX (banking), FRESX (real estate), etc. That is because these funds may not move in the same direction as the S&P 500, and each has its own time for buying and selling. We will present the general method first, then explain the rationale based on the central limit theory to support this. The first step is to download the price of FBIOX for the most recent ten years. We used Yahoo Finance at: <https://finance.yahoo.com/>. There are other websites where you can download the price data; just use the one that you are familiar with. Next, we will use the R statistical software to carry out data analysis. This software can be downloaded for free at: <https://www.r-project.org/>.

Now we will carry out some basic data analysis using the price data of FBIOX, such as the descriptive statistics, to obtain the five-number summary of the price data: (minimum, 25th percentile, median, 75th percentile, maximum) and the mean/average price of

the FBIOX fund. Then we will plot the price data and the estimated probability density of the data to show the distribution of the fund price. This helps us visualize the price movement and see where the current price is located in the density curve. The last step is to find out the percentile of today's price against the historical price, and then make a decision to buy, sell, or take no action. We have collected all R commands to carry out this analysis in the Appendix of this article (Table 1, Figure 1). Figure 1 shows the trace plot and the estimated probability density function of the FBIOX price in the past 10 years. The current price is \$17.05, which is at the 21.4th percentile compared to the historical data. This means the probability for the FBIOX to go below \$17.05 is about 21.4%, and the probability to go above \$17.05 is about 1-21.4%=78.6%. Therefore, it is a good time to consider buying FBIOX.

The rationale is simple: if the historical FBIOX price has not moved up in the past 10 years, it can be considered a stable process. That is, the future price will follow the same probability distribution as the historical price. Since the fund price is the weighted average of many stocks, it should follow a normal distribution based on the Central Limit Theorem [4]. And we can use the past 10 years' data to estimate its price distribution. The basic idea of investing is to buy low and to sell high. But how to decide the "low" price and the "high" price for a mutual fund? We define the low price as

the 25th percentile of the historic data and consider any price below this level to be low. Similarly, we define the high price as the 80th percentile of the historical data and consider any price above this level to be high. In layman's language, if you buy at or below the 25th percentile, then with a probability of 0.75, the future price of the fund will be higher than your buying price; In other words, you will have a 75% chance to make money buying this fund at the 25th percentile. And we suggest selling at the 90th percentile, because you only have a 10% chance of making more money and a 90% chance of losing at that level.

Use FBIOX as an example: the price of FBIOX will follow the distribution of the fund shown in the right panel of Figure 1. Our data summary in Table 1 shows that the 25th percentile is \$17.73, and today's (04/17/2025) closing price is \$17.05 per share, so it is appealing to buy, since there will be a higher than 75% probability of making money in the future. And if you have this fund now, at what price should you sell it in the future? The general rule is when the price goes above the 80th or 90th percentile (i.e., \$23.31 or \$24.62) of the historic price. That is, sell it at or above \$23.31 per share. And your profit will be at least: \$23.31-\$17.05=\$6.26 per share. We don't know when the price will go up to this level for selling, but we do know that it will be there someday. We have applied this strategy for different mutual funds in the past few years, and it works well.

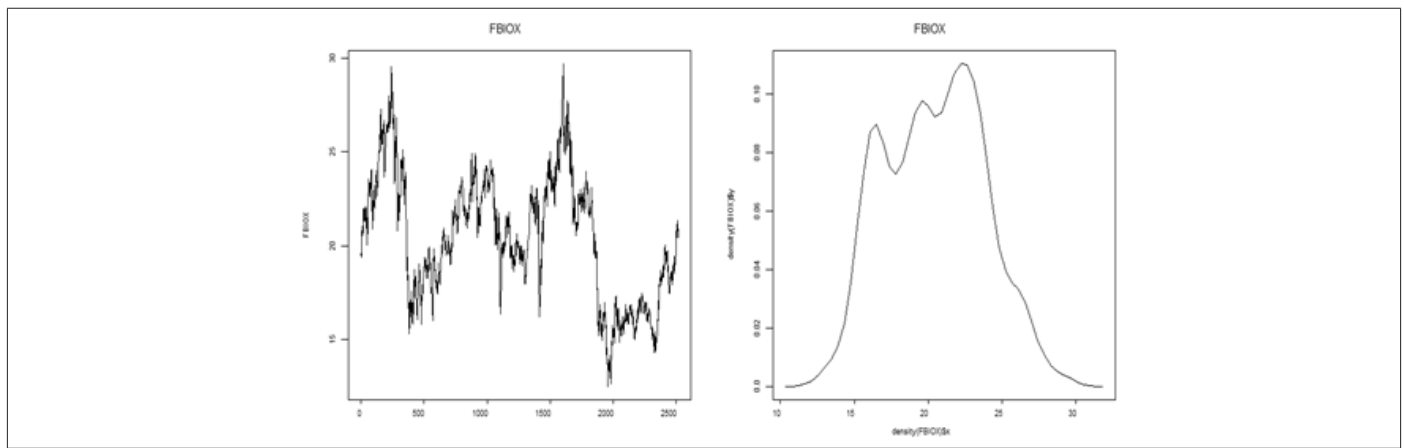


Figure 1: Trace plot and estimated density curve of the FBIOX price in the past 10 years.

Table 1: Data summary of the price of FBIOX.

Minimum	25 th percentile	Median	Mean	75 th percentile	Maximum
\$12.47	\$17.73	\$20.48	\$20.44	\$22.92	\$29.72

*Note: Today's (04/17/2025) closing price: \$17.05.

This is the summary: for an ordinary mutual, buy it when its price is below the historic median, or better, when it is below the 25th percentile, and sell it when its price is above the 80th or 90th percentile. Never buy when the price is above the median. We suggest buying it in a few days once the price is below the mark. The reason is: it is difficult to catch the lowest price, but to catch a price close to the lowest is easy. And the data analysis should be updated every 6 months. As for those star index funds that track the S&P

500, their price rarely goes down to the median, we will provide some guidance in our next article.

Acknowledgement

None.

Conflict of Interest

None.

Appendix:

R code to carry out the data analysis using FBIOX data.

Everything after the ## is the comments

Round (summary (FBIOX), 2) ## gives the five-number summary.

Mean (FBIOX<17.05) ## gives the percentile of the current price

quantile (FBIOX, c (0.8,0.9)) ## gives the 80% and 90% value

commands below plot Figure 1.

```
Par (mfrow=c (1,2))
```

```
plot (FBIOX, type='l', main="FBIOX")
```

```
plot (density (FBIOX), type='l', main= "FBIOX")
```

References

1. Liebenberg, T (2020) Can you beat the market? Invest Sensibly.
2. Schiffrin B (2024) Popularity of Index Funds is Both a Blessing and a Curse. Better Markets.
3. There's nothing average about dollar-cost averaging.
4. https://en.wikipedia.org/wiki/Central_limit_theorem.