Mutual Fund Report
MSE 304 – Engineering Economy
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Submitted to Professor Sarfaraz

by:

Abstract

Our group analyzed three mutual funds with varying investment philosophies and fee structures in order to assess the relative performance of each based on a rate of return analysis. For the purpose of this study, the group chose Quaker Funds' Aggressive Growth Stock Fund (QUAGX), Fidelity's Freedom 2030 Fund (FFFEX), and Strong's S&P 500 Index Fund (SINEX). The study period for the analysis began on Monday, February 18th and continued through Friday, April 12th. Daily stock prices were obtained from yahoo.com's finance website. A pretax rate of return was established for each fund at the end of the study period. Prices rose slightly for each fund, but each one had a different fee structure that affected either the stock's daily price or the fund's initial or closing investment. Quaker's initial sales load of 5.5% immediately took it out of contention for best performing fund. The other two funds were very close in performance, but an early redemption penalty fee assessed to the closing balance of Strong's fund, as well as a higher dividend payout for Fidelity, made Fidelity an overall performance winner based on a rate of return of 4.01% for the eight-week study.

Purpose of the Project

The overall purpose of this project was to become familiar with the procedures involved in evaluating performance of stock/mutual fund investments. It immediately became apparent in our analysis of the mutual funds that no two funds are alike in fee structures. Some funds assess sales loads that typically hover around 5% of your initial investment. Therefore, your investment is immediately in a deficit position that will take some time to overcome. If an average growth fund averages a 10% return in a good year, then one could expect it to take up to 6 months to make up the sales load cost. Other funds assess early redemption fees if you sell your shares before a given period of type, typically the first 6 months. The other fees are considered to be management fees that make up what is known as the expense ratio. These fees are not taken directly out of your investment, but instead are taken out of the fund's assets. Therefore, the expense ratio has an affect on the overall closing price of the mutual fund. For the purpose of this project, we are looking at funds that utilize different fee structures and have differing expense ratios so that we can analyze the impact that these have on the overall performance of each fund.

Project Procedure

Analysis began with an investigation of mutual funds on the Yahoo! mutual fund website (http://biz.yahoo.com/funds). There are various tools on this site that allow you to screen funds by criterion such as investment objective. Once the funds have been selected, profiles can be viewed that give detailed information on the fund's strategy, its holdings, historical performance, as well as its fee structure. The price per share can be tracked daily and analytical charts can be chosen to compare performance to other funds or indices with similar investment objectives. After careful research, the following three funds were chosen for our analysis: Quaker Fund's Aggressive Growth Fund (QUAGX), Fidelity's Freedom 2030 Fund (FFFEX), and Strong's S&P 500 Index Fund.

Quaker Aggressive Growth Fund (QUAGX)

This fund was selected in order to provide us with a contrasting example of a fund with a sales load in its fee structure. It is a fund that primarily invests in companies with a larger market capitalization and that exhibit the ability to perform well based on their undervalued status. This fund assesses a 5.5% sales charge on each new purchase of shares. It also has a relatively high expense ratio of 2.32% when compared with the other funds in this study. Despite these relatively high fees, the fund has been consistently among the top performers in its investment category for the last 5 years.

Fidelity Freedom 2030 Fund (FFFEX)

This fund is on the opposite end of the fee spectrum from Quaker's fund. With no sales loads and a miniscule 0.08% expense ratio, it is operating at a huge advantage when looking at how the fees affect the performance of a fund. This fund's performance is almost strictly tied to the direct performance of each of its holdings.

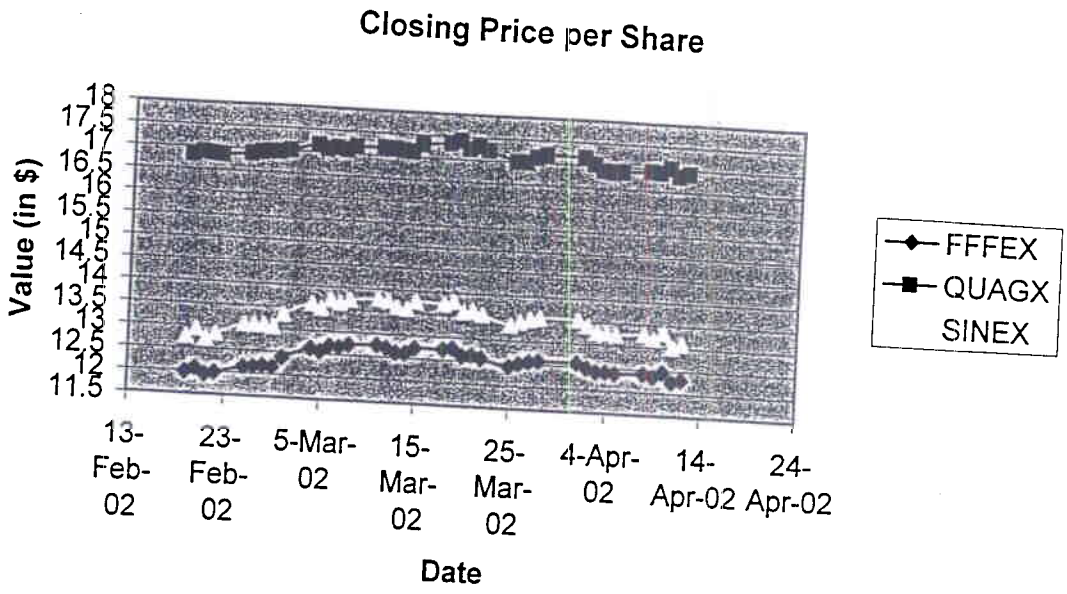
Strong S&P 500 Index Fund (SINEX)

This is another large growth fund that takes positions in each of the holdings of the S&P 500 index. Its fee structure is also relatively low, but not quite as low as that of Fidelity's. There is no sales load associated with this fund, but there is an early redemption fee that is assessed when selling shares in the first six months of ownership. Its expense ratio is 0.45%.

Discussion of Results

Data points were collected and monitored over the test period to make sure that the data would be appropriate for the analysis. All three funds exhibited a very similar pattern in the closing price per share as illustrated in the following graph:

Figure 1 – Price per share for each fund



It is evident from the graph that each fund peaked in the middle of the study period, with each reaching their highs during the third week of March. The graphs for the Fidelity and Strong funds are practically identical, while the graph for the Quaker fund is a little more flat. Each fund exhibited a final price at the end of the period that was slightly higher than the initial purchase price.

Table 1 – Initial and closing prices for each fund

	Initial Price	Initial Investment	Shares Purchased	Final Price
QUAGX	$16.83	$10,000	561.4973	$16.91
SINEX	$12.77	$10,000	783.0854	$13.11
FFFEX	$11.98	$10,000	834.7245	$12.31

The data points listed in Table 1 above provide the crucial elements to be used in the rate of return analysis to be performed. The number of shares purchased is determined by dividing the initial investment by the initial purchase price. The shares purchased are then multiplied by the final price to give the final share value of the initial investment. In

the case of Quaker fund, the number of shares purchased is calculated in a slightly different manner. Since new purchases of shares in the fund are assessed with an upfront sales charge, the initial investment is reduced by a fee of 5.5%. The initial investment is still $10,000, but only $9,450 will go to work for you in this case ($10,000 - $10,000*5.5% = $9,450). Therefore, fewer shares are purchased in the fund than if there was no sales charge at all.

The absolute final balance is not merely the number of shares purchased multiplied by the final price. To this value, you must subtract the cost of any redemption fees and add the dividends per share that may have been awarded. Table 2 below shows any final fees assessed and the dividends awarded to each fund:

Table 2 – Total fund values at end of study period

	Share value	Redemption Fees	Dividend value	Total Value
QUAGX	$9494.92	$0	$50.53	$9,545.45
SINEX	$10,266.25	$51.33	$31.32	$10,246.24
FFFEX	$10,275.46	$0	$125.21	$10,400.67

Each fund has historically awarded a dividend per share once a year. The dividends for these funds are all awarded at different times of the year. For the purpose of this study, we adjusted this dividend period so that it would coincide with our study period. Fidelity had the highest dividend payout at fifteen cents per share, followed by Quaker at nine cents per share, and then finally Strong at four cents per share. Since Fidelity had the highest number of shares purchased in the beginning of the study, they were able to put their shares to work in the end with a higher dividend payout.

Rate of Return Analysis

There are many ways to calculate a pretax rate of return. Probably the simplest way is to subtract the original balance from the final balance and divide by the original balance. In

the financial services industry, they often refer to this rule as "new minus old over old". For the purpose of our analysis, we have followed the procedure illustrated in the course textbook. Quite simply, if the procedure illustrated on page 239 of Blank & Tarquin's *Engineering Economy (5th Ed.)* is followed[1], you get a result for each fund that matches the "new minus old" rule. By listing the negative cash flow in the first row and following it with the positive cash flow at the end of the period, you can then use Excel's IRR function in the third row to get the rate of return for each fund. The following table shows the calculated rate of return using the IRR function in Excel:

Table 3 – Pretax rates of return for each fund

	FFFEX	SINEX	QUAGX
Beginning period cash flow	-$10,000.00	-$10,000.00	-$10,000.00
Ending period cash flow	$10,400.67	$10,246.24	$9,545.45
Rate of Return	**4.01%**	**2.46%**	**-4.55%**

Conclusions

The Fidelity fund significantly outperformed the other two funds, especially when considering it was merely over an eight-week period. Its fee structure gave it a strong advantage from the beginning. There were no fees assessed for purchase or sale of shares in the fund and its miniscule operating expense ratio of 0.08% meant that the price of the share was not affected greatly by management costs. The Strong fund performed reasonably well for an eight-week period. Its slightly higher expense ratio of 0.45% and early redemption penalty is most likely what separated it from the superior performance of the Fidelity fund. The Quaker fund operated at a major disadvantage in this study in that it was immediately hit with a 5.5% sales load. The final rate of return was – 4.55%,

[1] L. Blank & A. Tarquin, *Engineering Economy, 5th Ed.*, McGraw-Hill: New York, 2002.

which suggests that it did make up some of this initial fee over the study period, but it would take close to one year to break even at the funds current pace. However, it is impossible to predict the course a fund it going to take. The Quaker fund is an extremely high performer in the Large Growth category. Over intermediate- and long-term periods, it has even been able to outperform funds with no sales loads.

This is one of the major lessons learned from the study. Our analysis took place over an eight-week period, but mutual funds are not typically purchased as a short-term investment objective. Mutual fund companies compete with each other based on fee structure and performance issues. Some companies try to justify fees based on performance, while others claim they perform just as well or better without the high fees. In the end, it really comes down to one's comfort level with the investment firm's objectives and risk level. Past performance is not a good predictor of future gains or losses.

For the purpose of this study, Fidelity is a clear winner with a rate of return of 4.01%, followed by Strong at 2.46%, and then finally Quaker at – 4.55%. In addition to Fidelity's more beneficial cost structure, it also made significant gains over the other two in dividend payouts, which illustrates out one last point to be made in this study. The more shares you are able to purchase, the more they can go to work for you when dividends and capital gains are awarded. Fidelity was a great performer because it had an unbeatable fee structure and the lowest price per share at the beginning of the study. If you were to use mutual funds for a short-term investment strategy, then this fund would be the clear choice.

APPENDIX

Table 4 – Daily closing prices for each fund

Date	FFFEX	SINEX	QUAGX
12-Apr-02	12.31	13.11	16.91
11-Apr-02	12.25	13.03	16.85
10-Apr-02	12.46	13.34	17.02
9-Apr-02	12.35	13.2	16.91
8-Apr-02	12.41	13.28	16.93
5-Apr-02	12.39	13.25	16.89
4-Apr-02	12.41	13.29	16.87
3-Apr-02	12.4	13.28	16.89
2-Apr-02	12.48	13.41	17.03
1-Apr-02	12.58	13.53	17.16
28-Mar-02	12.58	13.54	17.18
27-Mar-02	12.55	13.5	17.11
26-Mar-02	12.5	13.43	17
25-Mar-02	12.43	13.35	17
22-Mar-02	12.58	13.55	17.23
21-Mar-02	12.64	13.61	17.31
20-Mar-02	12.61	13.59	17.24
19-Mar-02	12.77	13.81	17.41
18-Mar-02	12.73	13.75	17.35
15-Mar-02	12.73	13.76	17.29
14-Mar-02	12.61	13.6	17.13
13-Mar-02	12.61	13.62	17.14
12-Mar-02	12.7	13.75	17.18
11-Mar-02	12.75	13.78	17.18
8-Mar-02	12.73	13.73	17.16
7-Mar-02	12.67	13.65	17.09
6-Mar-02	12.69	13.71	17.13
5-Mar-02	12.56	13.52	17.09
4-Mar-02	12.62	13.61	17.16
1-Mar-02	12.38	13.35	17.01
28-Feb-02	12.16	13.05	16.97
27-Feb-02	12.18	13.09	16.96
26-Feb-02	12.15	13.08	16.94
25-Feb-02	12.14	13.08	16.9
22-Feb-02	11.99	12.85	16.85
21-Feb-02	11.94	12.74	16.87
20-Feb-02	12.07	12.94	16.89
19-Feb-02	11.98	12.77	16.83