A Comparative Study on the Returns of Active Funds Versus Passive Funds A Quantitative Research Based on Financial Market Data

Yi Sheng[1]

[1]2022094@appleby.on.ca

[1]Appleby College Oakville, ON L6K 3P1, Canada

Abstract— No matter in the investment industry or the financial community, there has been a heated discussion on the returns of active funds and passive funds for decades. The rapid development in the field of finance coupled with diverse mushrooming financial derivatives is entailing the financial markets with both benefits and risks. This paper aims to present a comparative study on the performance of active funds and passive funds, and provide further evidence for financial economists and broad investors to make sound decisions. Apart from the qualitative method, such as academic review and industry research, this paper also retrieved data from financial databases, such as Morningstar and Yahoo Finance, and calculated the average returns of active and passive returns to conduct quantitative analysis in both China and the U.S. market. Through the comparison of performance in different countries and time intervals, this paper seeks to better understand these two forms of fund strategies and to offer insights to cope with potential risks and future opportunities.

Keywords-comparative study; active funds; passive funds; financial returns, China market, U.S. market

1 INTRODUCTION

Whether active funds or passive funds perform better has long been a question of great interest in a wide range of fields. Most studies have only focused on the rate of returns of two types of funds, but failed to consider their performance under the context of mature and emerging markets. Furthermore, short-term studies do not necessarily show the subtle changes over time. This paper therefore sets out to address these research gaps by exploring not only the advantages and disadvantages of active and passive funds, but also their performance in both China and the U.S. market. This paper first gives a brief overview of active and passive funds, including their concepts, features, and recent trends. Then this paper gathers market data over the past ten years and conducts quantitative analysis to analyze their performance. The findings should make an important contribution to the field of investment and provide fresh insights into making financial decisions.

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2 DEFINITIONS AND DISCUSSIONS

Based on different investment philosophy, funds can be classified as active funds and passive funds. Just like other types of funds, both active and passive funds are expected to make profits from various kinds of assets they hold, such as shares, bonds, property, or commodities [1]. Before entering into the process of deeper academic discussions, this paper clarifies the specific concepts of two types of funds, characterizes their main features, and describes their roles in the financial market. This section describes active funds and passive funds extensively and serves as a useful standing point for further comparative analysis.

2.1 Active Fund

In general, active funds target a better performance that surpasses the funds' stated objectives or the market average level. During this process, active fund managers carefully pick out and invest in valuable assets. Besides, coupled with market research reports, industry forecasts, and subjective judgments, they will play an active role in trading in and out of stocks until eventually the assets they managed can reach certain goals [2].

Therefore, to a greater extent, the final returns of active funds depend on the expertise, subjectivity, and market operations of fund managers, who will make decisions on how to invest the fund's money and will offer the chance to beat the market. Meanwhile, active funds often target high-income financial products to meet earnings expectations and are allocated among "risky" assets, such as shares and corporate bonds. Since high returns are always associated with great risks, active funds are comparatively more volatile and may face more uncertain risks. Furthermore, each time a transaction takes place, the fund will incur taxes and other fees, which in turn bring down the yields. Correspondingly, active fund managers usually charge a higher commission fee and may face risks of performing under the market index. Due to market fluctuations, all investments could either rise or fall in value and there is no guarantee that fund managers, even the most outstanding ones, can always select investments that outperform the market [3]. Therefore, investors need to think things through and then determine if the costs and risks of active funds are worth the potential profits they make.

2.2 Passive Funds

On the contrary to active funds, passive funds aim to perform in line with the market and do not actively seek to outperform it. The main goal of passive funds is to simply replicate the performance of the index and follow the movement of the market. Passive funds also choose and track a specific index or market segment to make financial decisions, and because of this, they are also referred to as "index funds" [4]. Since all the shares as well as their proportion in the index fund are consistent with the selected index, the performance of the index fund relies upon the performance of this particular index and may follow the ups and downs of it. Thus, passive funds may perform more constantly but only gain the average returns.

There are several indexes to help passive funds decide which portfolio to invest in. A commonly used index is FTSE100, which measures the performance of the 100 biggest companies in the UK based on their share value [5]. As calculated in Figure 1, it is a market-weighted index, and the individual index level is calculated using share prices, the number of shares, and the free

float adjustment factor. Given the fact that the fluctuations of stock prices can have major effects on the index level, the index level will also vary during the day accordingly.

$$Index\ level = \frac{\sum_i Price\ of\ Stock * Number\ of\ Shares * Free\ Float\ Adjustment\ Factor}{Index\ Advisor}$$

Figure 1 The Formula of FTSE 100 Index Level [6]

Another popular and widely quoted market index is the S&P 500, which is composed of the 500 largest companies in the U.S. It is often regarded as one of the best indicators of America's stocks, and can be used as a statistical benchmark against which the performance of other investments can be evaluated.

Passive funds can be further divided into two categories, one is the pure index fund, and the other is the active index fund. A pure index fund is fully invested in the same portfolios of the tracking index. Even though there is a clear tendency that the stock prices continue to fall in the next six months, investors will still load up with these same stocks and may not take active actions or make future judgments. However, for an active index fund, the initial investments are composed based on a benchmark index, and fund managers can make small adjustments to the portfolio according to market trends and certain conditions, such as adding other securities that are not included in the index, or taking out several index constituents. It is an integrated approach that aims to utilize the benefits of index-oriented investment as well as active management [7].

By the very nature of passive funds, the job of a passive fund manager is to track the performance of an index and doesn't necessarily require much effort to pick investment portfolios. Therefore, passive fund management often charges lower fees and reduces financial costs. Investors can also take advantage of the complete access to the market, the convenience and flexibility of transactions, and enjoy a highly transparent trading process when buying and selling the underlying assets.

In short, this paper summarizes the pros and cons of active and passive funds respectively in the following table1:

TABLE 1. ACTIVE FUNDS AND PASSIVE FUNDS

Type of Funds	Advantages	Disadvantages
Active Funds	Possible to beat the market index and achieve high returns	High market risks with more volatile market fluctuations
	Choose different investments based on personal preference	High annual charges may discount the final returns
Passive Funds	Perform consistently with the market index	Entirely depends on the performance of the index being tracked
	Save time and manpower and highly transparent process	Receive market average returns

2.3 Discussion: An Open Race to Returns

With reference to our discussion above, it is clear that although active funds and passive funds have completely different objectives and operation methods, the conclusion remains uncertain regarding which type of fund could generate greater proceeds. It could be possible that the stocks picked by fund managers didn't outperform the market as expected, or the passive funds help investors earn higher returns.

Over the years, there has been a heated debate among many experts and scholars over the topic of whether actively managed funds or index funds are superior. Speaking of the global size of these two funds, according to a recent forecast report released by Blackrock, index-tracking funds occupies nearly 18 percent of the global stock market, while actively managed hedge funds, mutual funds, and institutional accounts are estimated to be 25.6 percent, with a total of $17.4 trillion [8]. The rest of 57 percent are owned by insurance companies, national government, or pension funds, and they can't be categorized as either active funds or passive funds. It can be noticed that passive funds have gained wider popularity recently because the report stated that passive ownership of U.S. funds went up from 19 percent in 2009 to 37 percent, and index-tracking funds have attracted investments worth $111 billion [8]. However, the head of other fund corporations argued that active managers' underperformance is momentary and still stands good chances of beating the market, especially in a major bear market.

A well-known argument between active funds and passive funds is the ten-year bet made in 2007 by Warren Buffet, one of the world's richest people and brightest investors [9]. He publicly wagered $500,000, arguing that S&P 500 index mutual funds could outrun actively managed funds by a group of professionals. Ted Seides, a former manager of an asset management firm, took the bet and handpicked a bucket of hedge funds. The final result was revealed in 2017 as indicated in Figure 2. By the end of the bet, Seides had gained $220,000 at a cost of nearly $1 million, and over the same time span, Buffett's cost-effective mutual funds earned nearly earned $854,000.

In this bet, it seems that in a mature stock market, like in the U.S., it is more likely for actively managed investments to underperform the returns of passive investing. However, it is uncertain whether in emerging stock markets, for example in China, the case would still be the same. Therefore, this paper aims to conduct a comparative analysis of active funds and passive funds, and their performance in the U.S. and China stock market, providing some fresh insights for investors to make financial decisions. It is also hoped that this research can contribute to a deeper understanding of the international and domestic financial market.

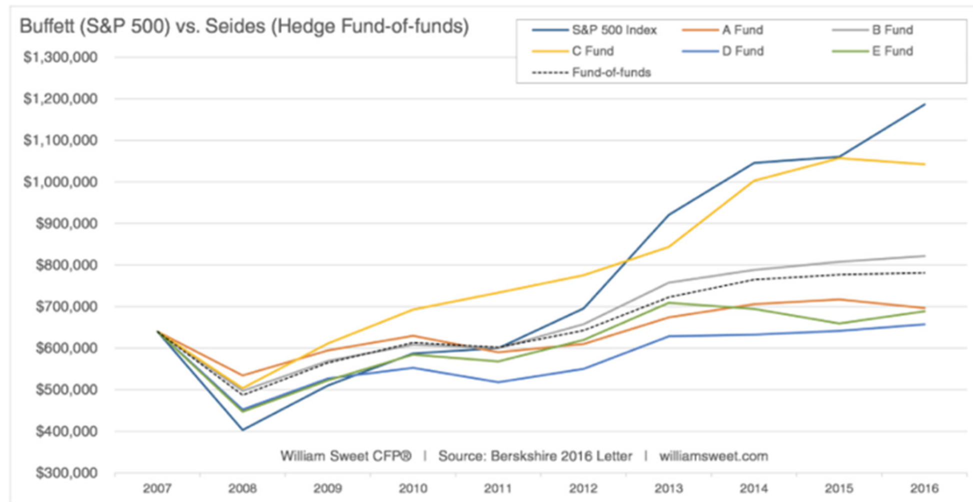

Figure 2 The Result of Ten-Year Bet

3 COMPARATIVE ANALYSIS

The mature and emerging market can exert a significant influence on the performance of the stock market. Therefore, the comparative analysis section is divided into two parts. The first part will examine the returns of active and passive funds in the U.S. market. The second part will go on to discuss how active and passive funds perform in the context of China stock market.

3.1U.S Market: Active Funds v.s. Passive Funds

Having thrived for almost 20 decades, the U.S. stock market is known as the most developed market in the world. Nowadays, the U.S. stock market features a comprehensive monitoring system, an open and transparent trading process, and a large body of institutional investors.

Under this background, this paper studies the success rates of active and passive funds during different timeframes as presented in Table 2. The original data were retrieved from Morningstar, a leading investment research and analysis institution, as of June 30, 2021 [10]. It compares the success rates of various types of active funds with their passive index counterparts. The success rate indicates the percentage of active funds that outperform those passive funds in the same category during a given period. For example, if we hold 10 U.S. large blend active funds for one year, nearly 2 of them can generate greater returns in contrast with large blend index funds. According to the statistics in Table 2, we can see that among all the 48 success rates, only 5 of them are above 50% (noted in bold), which means that in these categories, active funds are likely to perform better than passive funds.

TABLE 2. ACTIVE FUNDS' SUCCESS RATE BY CATEGORY (%)

Category	**1-Year**	**3-Year**	**5-Year**	**10-Year**
U.S. Large Blend	20.6	22.0	12.3	14.8
U.S. Large Value	14.1	9.6	9.5	20.6
U.S. Large Growth	29.8	16.0	7.4	7.1
U.S. Mid Blend	23.5	14.8	23.1	6.9
U.S. Mid Value	8.1	16.7	13.0	26.9
U.S. Mid Growth	35.4	36.0	27.5	22.7
U.S. Small Blend	46.2	34.4	31.9	26.1
U.S. Small Value	27.7	32.1	22.6	28.6
U.S. Small Growth	27.8	17.6	21.3	17.6
Foreign Large Blend	36.3	**50.0**	44.7	33.1
Diversified Emerging Markets	**67.9**	**69.6**	**51.6**	32.4
Intermediate-Term Bond	24.5	41.5	**53.3**	39.0

a. Source: Morningstar. Data as of June 30, 2021

Furthermore, looking at the long-term tendency of the collected data, the success rates of active funds fall quickly with the passage of time, and 10-year success rates are the lowest no matter for large, mid, or small size funds. The reasons behinds this phenomenon is that the short-term performance of funds is largely affected by a series of random and unexpected factors, but the impact of these factors can be reduced over time, which suggests that the success rate during an extended time can be served as a useful guideline in analyzing the returns of two types of funds. When holding U.S. active funds for 10 years, over half of them have nearly 20% chances to outrun passive funds, as shown in Figure 3. Therefore, in a mature market like U.S. stock market, passive funds are highly possible to produce greater returns and achieve steady market performance, especially in long-term investments. These findings also align with Buffet’s bet mentioned in the previous section.

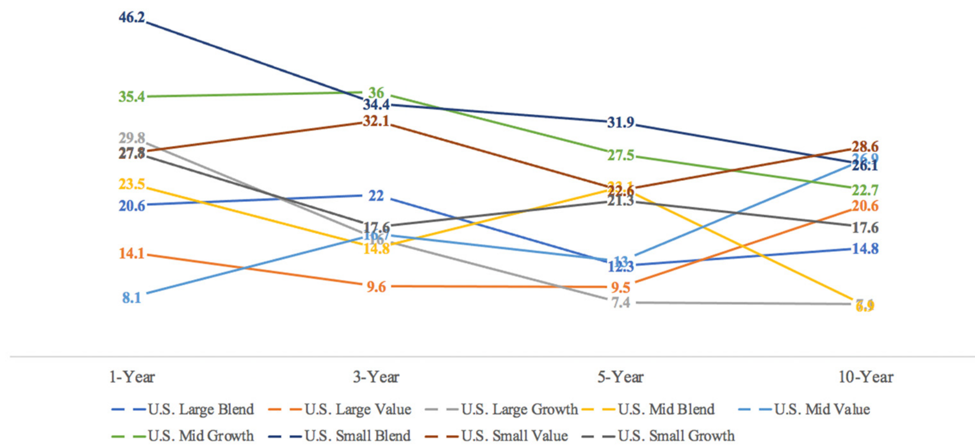

Figure 3 Overall Trend of Active Funds' Success Rates

3.2 China Market: Active Funds v.s. Passive Funds

China has long been regarded as one of the most promising and fastest-growing emerging economies. To analyze the performance of active and passive funds in the China stock market, this paper gathered all the listed and delist active funds over the past ten years, and analyzed their annual rate of return to conduct comparative analysis. For passive funds, this paper adopts Shanghai Composite Index as the tracking index, and its changes from 2010/01/01 to 2020/12/31 are shown in Figure 4.

Figure 4 Shanghai Composite Index from 2010/01/01 to 2020/12/31

As can be seen in the Table 3, overall speaking, the yielding rate of active funds reaches nearly 806% and is significantly more than that of passive funds, which is about 168%. This result is completely opposite to the case in the U.S. market, and reflects that Buffet's rule does not apply to China. To ensure the comparability and comprehensiveness of data, this paper also probed

into different stages based on the market life cycle, and investigated the performance of active and passive funds respectively. From 2013 to 2018, the market went through both bull and bear markets. During this period, active funds gained 86.5% of returns, while passive funds received only 20.76%. Therefore, for long-term investment in China, active funds are more likely to deliver higher returns than passive funds.

When looking closer at the bull market separately, we find out that active funds maintained higher returns of 133.39%, but it didn't take remarkable superiority since passive funds also achieved 84.47% returns. If we only observe the rapid rise period during the bull market, passive funds surprisingly surpassed active funds, although the gap was not very large. A possible explanation for this result may be that all the stocks are likely to go up when times are good, and thus, it is hard for active funds to display their advantages [11]. However, the situation can be quite contrary in the bear market. When share prices plummeted, from 2015/06/01 to 2018/12/31, active funds could fully show fund managers' ability of market timing and stock picking, and had the opportunity to minimize the losses. As time passed by, the percentage drop of active funds declined, while passive funds still followed the up-and-down movement of the market. In conclusion, in China stock market, active funds generally outperform passive funds, except for the period of a rising bull market.

TABLE 3. AVERAGE RETURNS OF ACTIVE AND PASSIVE FUNDS

Stage	Active Funds	Passive Funds
2010/01/01-2020/12/31 (Observation Period)	**805.90%**	167.53%
2013/01/01-2018/12/31 (Bull + Bear Market)	**86.50%**	20.76%
2013/01/01-2015/06/30 (Bull Market)	**133.39%**	84.47%
2014/07/01-2015/06/30 (Rapid Rise During Bull Market)	80.06%	**90.43%**
2015/06/01-2018/12/31 (Bear Market)	**-24.19%**	-41.29%
2015/06/01-2016/02/29 (Sharp Fall During Bull Market)	**-28.43%**	-40.70%

4 CONCLUSION

From the discussions above, it is clear that active funds and passive funds display different patterns of performance in China and U.S. This paper further examined the reasons behind this phenomenon and summarized two major causes. Firstly, the market cycle and characteristics of China and U.S. market are quite different. Through the comparison between Figure 4 and Figure 5, it is noticeable that, for A-share in China, long-term trends remain bearish, and the bull market only lasts for a relatively short time. It is hard for passive funds to work well in a less established and more volatile market. But for U.S. futures, the market stays in a prolonged bull market, and passive funds are more possibly to generate greater returns in an efficient market. Secondly, these two markets possess different structures of investors and transactions. Institutional

investors own over 80% of the U.S. market value, and they prefer the concept of value-based investing. But in China, retail investors tend to make speculative investments, occupying nearly 82.01% of the total amount of transactions in the stock market, and active fund managers can bring their initiatives into full play [12].

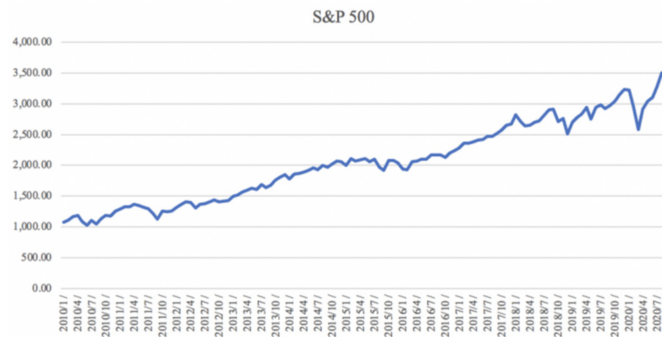

Figure 5 S&P 500 from 2010/01/01 to 2020/12/31

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