Analysis of the Rationality of Hedge Fund Replication

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Abstract. Hedge funds have become a hot topic in recent years, more and more people hope that through the hedge funds this way of high-yielding wealth management profit, but the threshold of the hedge funds, too many people, is people can't help doubt, that we can communicate about copying the former case to profit, this paper details about copying the possibility of hedge funds.

Keywords: Hedge Fund, Rationality, Replication.

1. Introduction

Hedge funds might consistently beat mutual funds but not market indices, according to research by Ackerman et al. that examined the risk-adjusted performance of mutual funds and hedge funds. Additionally, they demonstrate that hedge funds are more unstable than mutual funds and market indices [1]. On the contrary, Liang and Kat observe data from 1990 to 1999 carefully and discovered that hedge funds were less volatile than market benchmarks (THE S&P500). He credits cross-diversification for the low volatility of hedge funds. Liang and Kat draw the conclusion that hedge funds offer superior risk-adjusted returns, which is consistent with earlier studies [2]. Later research by Amin and Kat, however, disputed this conclusion (2003) [3]. According to the authors' findings, hedge funds are unable to improve the risk-return profile of portfolios when used alone; but, when integrated with S and P500, they can. According to Brown et al. (2001), hedge funds see a decrease in volatility following a strong first half of the year performance and an increase in volatility following a weak performance. As a result, hedge funds and the market are tightly intertwined, and if the market changes, the same hedge fund approach may not be successful [4].

By monitoring more than 6,000 hedge fund managers using a variety of tools, including the Petra database and a selection of 500 hedge funds based on fund size, length of 13F filing history, and investing approach, Feng and his colleagues attempted to duplicate hedge funds. By scoring, similar to the top 10 hedge fund managers' assets in more than $1 billion of investors, every six months. To choose the top ten billionaires, these investors must be submitted on the securities and exchange commission member 13-F form using the following criteria: A selected billionaire must have an eight-year return on their form 13F portfolio that would put them among the top 15 billionaires. The requirements are as follows: A selected billionaire must have an eight-year return on their form 13F portfolio that would put them among the top 15 billionaires. The requirements are as follows: (1) portfolio value shown in table 13F must be at least $1; (2) hold at least ten securities; (3) annual turnover shall not exceed 50%; and (4) annual turnover shall not exceed 50%. Finally, the Alpha value remained undiscovered [5]. Lars Jaeger found empirical evidence showing alpha in the hedge fund world pushing over time [6].

Stoforoes et al. looked at data on 13 hedge fund strategies from US hedge funds over a 19-year period (1995-2014) [7]. They discovered that during crises, hedge funds' average dynamic correlation rose, a conclusion that was supported by Forbes and Rigobon and Guesmi et al. Additionally, their statistics demonstrate that the dynamic correlation coefficient, which solely affects short-selling and global macro tactics, considerably decreases during non-crisis periods. They came to the conclusion that the majority of hedge fund strategies, if hedge funds except global macro and short selling, they were unable to outperform the S&P 500 during the dangerous situation and so were unable to adequately safeguard their clients [8]. The Hasanhodzic, L, Fung, and Hsieh study is the most important one on hedge fund replication [9,10]. According to Hasanhodzic and Lo's study, the linear multi-factor model, which includes the following five variables can accurately predict projected

returns from hedge funds: equities, corporate bonds, the US currency, credit spread, and commodities. Many other variables are included, including developing markets, convertible bonds, default spread, mortgage spread, and so on. It is obvious from this that it is may possible to duplicate the hedge funds, however, the returns are just average and some of the alpha values are puzzling.

As it travels, it gets smaller. He employed four distinct approaches to analyze the pattern between January 2000 and March 2007. (equity hedging, event-driven, merger arbitrage, and convertible arbitrage). To quantify the evolution of alpha over a 60-month period, a straightforward linear factor model is applied. Over the past six years, alpha for all four techniques has considerably declined. These tactics yielded an average of roughly 60 per month during the initial phase, which began in 2000. In the end, the system was only producing 10 to 20 basis points of alpha every month in 2007. This outcome confirms anecdotal evidence that alpha decreases when money enters the hedge fund sector. The aforementioned illustration focuses on average alpha levels, but if one examines the top 25% of money managers' results (as determined by the Sharpe ratio), one may observe that alpha decreases over time. A manager who achieves the highest returns for one year is unlikely to maintain that position the next year due to the poor retention rate of the top quartile of managers during the last seven years. The model makes the assumption that the outperformance of hedge fund managers follows a random distribution model for analysis. The top 25% of investment managers perform exponentially worse as a result of this straightforward premise. The empirical data for the top 25% of hedge fund managers' performance over the same time period deviated somewhat from the random distribution model. Therefore, it is inevitable to conclude that hedge-fund alpha does not last.

2. Explain what is hedge funds

The hedge fund is often referred to as an arbitrage fund or a hedge fund. For instance, I am doing short selling and risk hedging operations utilizing futures, options, and other financial derivatives, as well as associated various equities, to avoid and reduce investment risks to a certain extent. Hedge funds were founded in the 1940s by Alfred Winslow Jones, a financial journalist in the United States. He used long-short equity hedging to reduce the bear market risk, which is where the word "hedge" comes from, so hedge funds were born to reduce investment risk. For investment methods that have different strategies, hedge funds offer different kinds of solutions. Speculators use it to maximize investment returns, while sophisticated institutions or individuals use it to reduce their overall portfolio risk

Hedge fund businesses act as general partners and investment management consultants for limited partnership structures known as hedge funds, which include investors as limited partners. Sunshine Private Equity, on the other hand, refers to a group of investment trust financial instruments that were created and issued by investment consultancy firms as the sponsors, with investors serving as the entrusting parties and trust firms serving as the trustees. A different bank is keeping possession of the money.

Hedge funds have the potentials to invest in a wide range of asset classes, including but not limited to equities, bonds, derivatives, currencies, real estate, land, etc. While Sunshine Private Equity focuses mostly on stock investments and assets from the secondary market.

Sunshine Private Equity and hedge funds both have minimum subscription limitations and are closed offers to a small set of qualified investors. A small percentage of qualifying investors are individuals who have something worth $1 million or more over the previous two years or an annual income of almost $200,000 or more in the United States.

In order to purchase sunshine private investors in China, investors must meet certain "compliance" requirements. These requirements include having the corresponding risk identification and risk-bearing abilities, investing a minimum of 1 million yuan in a single confidential equity fund, and having a minimum of 3 million yuan in personal financial assets or a minimum of 500000 RMB yuan in personal annual

3. The problem may face when replicating the strategy of a hedge fund

3.1 The risk ventures and management of hedge funds

Heterogeneity; every hedge fund's investing approach is unique. also frequently utilize leverage while investing, and invest in illiquid assets. Some hedge funds have little transparency and high turnover rates.

Hedge funds need to take Survivor Bias into account since it can greatly inflate their investing results.

Liquidity Risk should be considered at both the asset and liability ends. Illiquid assets have low correlation, low volatility, and high autocorrelation.

Agency Risk. Because of the "2/20" incentive strategy, hedge fund managers are more inclined to take more risks (the cost of restarting after failure is too small). Generally, a high water mark can set the incentive line. It is necessary to return profits to make up for losses through the Clawback clause), increase the cost of restarting after failure, and fund managers participate in investment to reduce agent risks.

Hedge fund managers have a strong personality. Style Drift Risk is divided into two categories: scale change and investment leverage change.

Do due diligence before investing, such as rogue fund managers, Ponzi schemes,

3.2 Some strategies of hedge fund

3.2.1 Directional Strategies

The systematic trading tools used by Trend Followers, which invests in listed bonds, stocks, commodities futures, and money markets, examine historical price data and market patterns.

Global Macro is a strategy that invests in mispricing in stocks, currencies, interest rates, and commodity markets. The fund manager takes a top-down approach to analyze the value of financial instruments based on policy trends and Global macroeconomic events.

3.2.2 Event-driven Strategies

Risk Arbitrage, also known as Merger Arbitrage. Trading on publicly published events is called merger arbitrage or "insider trading" if the information is not publicly available. This strategy mainly bears the transaction risk, by long the acquired company's stock, short the acquisition company's stock, if the merger and acquisition transaction fails, the trading strategy will produce losses.

Distressed bond arbitrage strategy, also known as high yield bonds or junk bonds, Distressed Securities are mispriced due to restructuring, legal or compliance, corporate transactions, etc. When enterprises face financial or operational pressure or bankruptcy, they trade bonds at a discount. The investment can get a good return if the enterprises can finally get out of the predicament. Otherwise, significant losses will be incurred.

3.2.3 Relative Value and Arbitrage-like Strategies

By exploring the pricing anomalies of Fixed Income bonds, profits can be obtained by taking long underpriced securities and shorting overpriced securities. Fixed Income Arbitrage can also be used to seek to hedge market and interest rate risk exposure and achieve Duration=0.

Delta =0 is achieved by going long in Convertible bonds and other equity hybrids and shorting the equity portion or stock options. Hedging strategies such as Gamma and Vega can also be used.

Long/Short Equity arbitrage, the practice of going Long and Short on the stock market of a particular industry, region, or market capital, comes close to beta=0 (beta is a systemic risk).

3.3 The linear relationship between return and (Rm-Rf)

It's not hard to figure out that if a hedge fund is linear, its returns mean it can be copied. There's been a lot of research done and a lot of papers published in hedge fund replication over the last two years, and most of them, if not all of them,

Based on linear factor models, both. Investment banks are announcing increasingly frequently that they want to use linear factor models to emulate hedge funds. However, it's crucial to keep in mind

that linear models are just that—linear. In other words, the models simulate a hedge fund's exposure in a linear or directly proportionate to risk variables. And one aspect of hedge funds that everyone is aware of is that their returns are not linear. The underlying (underlying) market's changing condition over time and hedge funds' reliant structural interaction with it are what cause their nonlinear risk exposure.

Because hedge fund trading has option characteristics, hedge funds either explicitly trade options contracts and (even if they do not expressly buy and sell options) options have nonlinear return characteristics, or they constantly change risk exposure over time so that investment trading has non-static features. Chart 3 shows the distribution of returns for hedge funds in simple coordinates.

Parts of the hedge-fund return distribution are linear. But at the tail, in extreme risk events, the distribution of returns does not appear linear. Therefore, the same strategy may bring different benefits regarding risk events and market changes.

4. Discussion of specific examples

4.1 Examples of successful replication

Hasanhodzic and Lo's study on the replication of hedge fund performance is one of the most significant ones (and Fung and Hsieh). Hasanhodzic and Lo discovered that the five elements in the linear multi-factor model—stocks, corporate bonds, the US currency, credit spreads (), and commodities—can be used to accurately predict the projected returns of hedge funds. They supplement this by including additional variables like developing markets, convertible bonds, default spreads, mortgage spreads, and so on.

The success of the above two models suggests that most of the alpha provided by hedge funds comes from exposure to known risk factors, while true excess market returns are quite limited. So they're marketing beta as alpha. A big reason they return is not that they offer a hedge against downside risk, quite the opposite, but because they do badly enough when the market goes down, which means they are heavily exposed to tail risk.

This is consistent with the nature of factor investing, where the greater the (systemic) risk one takes (especially in 'bad' conditions), the greater the factor risk premium as compensation. So hedge funds are like any other asset. When the market goes up, hedge funds have different returns in their portfolios, providing diversification, but when the market goes down, all hedge funds suffer losses. In order to better explain hedge fund returns, two tail risk factors are added to the above seven-factor model: the s&p 500 put return and the S&P 500 put spread

4.2 Failed case

In-house bond arbitrage specialists from LTM have been hired to develop algorithms for forecasting market prices and identifying pricing anomalies. The plan is to purchase or sell bonds when they depart from their usual range, then wait for them to stabilize before making a profit.

Bond arbitrage is a model that has become popular across the financial industry. Mr Meriwether, who set up his own hedge fund after resigning after his oversight of his staff was blamed for the Salomon bond auction scandal, copied the model

But no one saw the real danger yet. Meriwether says the company always has an unprofitable month, and in an environment where everyone is losing money, long-term management still has $128 billion in assets.

Russia became the last straw for long-term asset management. For nearly a decade until 1998, Russia faced a financial crisis every two or three years, but each time, the other G-7 countries or the IMF came to Russia's aid. Because everyone thinks that a Russian bankruptcy would hurt the fish pond. In 1998, before the real crisis, Russia warned it was in danger, and bond prices fell a lot. Many big institutions and speculators, sensing an opportunity, bought up Russian bonds. The thinking was that when things did go wrong, other countries would do the usual thing and then the crisis would pass, bond prices would rise again, and there would be a steady windfall. This time, no one wants to

pick up Russia's TAB. The crisis spread quickly. The bad news came as many Wall Street executives were on vacation. Russia defaulted on its debt on August 17, 1998. Three days later global markets plunged. Investors sold at all costs and swap spreads reached mind-boggling levels. Long Term lost $553m in one day or 15% of its total capital. It lost nearly $2 billion in a month.

4.3 Difference between two examples

The difference is that in the successful case he tried to explain the mysterious alpha with more objective factors. It shows that most of the alpha provided by hedge funds comes from exposure to known risk factors, while the real excess market returns are quite limited. So they're selling beta as alpha. Copying hedge funds can only capture the average level of the whole industry, leaving a part of the unexplained alpha, but with the development of theories, this part of alpha will become smaller and smaller. After all, star funds and their fund managers are rare resources, and the future development trend of hedge funds will increasingly focus on the application of various alternative betas

5. Conclusion

This paper explores the likelihood of hedge fund replication through an introduction to the fundamental operating principles of hedge funds, real-world examples, and the perspectives of many experts. The repeatability of hedge fund returns shows that multiple risk variables can account for a significant portion of the alpha that the hedge fund industry markets. They may be imitated, and their success is not as enigmatic and unachievable as formerly thought.

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