Synthetic hedge funds☆

Mario Fischer [a,b,*], Matthias X. Hanauer [a,c], Robert Heigermoser [a,d]

[a] Department of Financial Management and Capital Markets, TUM School of Management, Technische Universität München, Arcisstr. 21, 80333 Munich, Germany
[b] Yale School of Management, Yale University, 165 Whitney Avenue, 06511 New Haven, United States
[c] Investment Research, Robeco Asset Management, Coolsingel 120, 3011 Rotterdam, The Netherlands
[d] Wealth and Asset Management, EY, Arnulfstr. 59, 80636 Munich, Germany

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ABSTRACT

We provide evidence on the performance and the replication success of a broad sample of 72 synthetic hedge funds from January 2009 to December 2013. Thereby, we assign the term "synthetic hedge fund" to mutual funds and exchange-traded funds with hedge fund indices as their benchmarks. Replication success is measured through different perspectives from distributional characteristics to risk-adjusted performance. We find an overall significant underperformance of synthetic hedge funds compared to an appropriate benchmark index. Furthermore, mutual funds (associated with active portfolio management) can produce return characteristics closer to hedge fund benchmarks than exchange-traded funds (associated with passive management) can. From a single strategy perspective, we find a picture of heterogeneity. Regarding the market environment, we show larger return differences for unusual market conditions than for regular ones.

1. Introduction

In recent years, financial markets have experienced a series of unprecedented crises: a liquidity crunch that seriously affected the interbank lending market, a burst of the US housing bubble, and the subsequent banking and sovereign debt crisis. This series of events has led to a global economic downturn while the consequences are still felt today. With the drop of global base rates to a historical trough, many investors have to cope with negative real interest rates. This specifically affects institutional investors such as endowments, pension funds, and insurance companies, which are typically committed to long-term agreements that have been entered at times when interest rates were on higher levels. Consequently, institutional investors are searching for alternatives to traditional investments in order to achieve the returns needed to fulfill their obligations. Hedge funds have received noticeably increased attention in recent years. This increased interest of institutional investors reveals a significant gap between characteristics of hedge funds and institutional investors' expectations. Institutional investors typically have high transparency requirements and impose restrictions on their investment mandates, as they are bound to strict

regulatory standards. It is moreover usual that they require a certain degree of liquidity to meet their contractual obligations. On the other hand, the hedge fund industry is marketed as an absolute return industry where returns depend on manager skills. Therefore, it is common that hedge fund managers do not provide position-level transparency, have limited capacity, and resist any restrictions in their investment process. This behavior is backed by the argument that any kind of restriction cuts down performance. In addition, hedge funds charge relatively high management fees compared to traditional mutual funds and commonly require lock-up periods.

Since it is apparent that expectations of both parties – institutional investors and hedge funds – are incompatible, ideas to obtain returns similar to hedge funds without directly investing in those funds have been brought up. Those concepts are combined under the terms "hedge fund replication," "hedge fund clones," "hedge fund tracking," or simply "synthetic hedge funds." Replicating the returns of hedge funds has gathered significant academic and practitioner interest since the beginning of the century. As a first step, it was necessary for academia to substantiate the claim that hedge fund returns are not entirely driven by manager skill.[1] After the theoretical framework had been investigated, the development of two different hedge fund replication approaches could be observed: a factor-based approach which uses linear factor models of investable assets to model the time series of hedge fund returns and a payoff distribution approach which models the

[1] For example, Agarwal and Naik (2004), Fung and Hsieh (2001, 2004, 2011) and Jaeger and Wagner (2005) show how hedge fund returns can be sufficiently modeled with exposures to systematic risk factors.

distributional properties of hedge fund returns. With both attempts delivering appealing results, it was only a question of time until commercially available synthetic hedge funds were issued by financial institutions.

Those products are usually marked by several advantages when compared to real hedge fund investments. Because synthetic hedge funds are arranged as mutual funds or exchange-traded funds, higher transparency and higher liquidity are natural. Furthermore, synthetic hedge funds claim not to rely on a specific manager. On the one hand, this eliminates manager-specific risks. On the other hand, this prevents possible benefits from managerial skills. Since the latter comes at a high cost, with the typical 2–20 fee structure of hedge funds, institutional investors are faced with the question: Is the skill of hedge fund managers worth the relatively high fees, or can synthetic hedge funds provide similar net returns for investors, as their low fees might compromise for less flexibility? If so, institutional investors might receive additional benefits from synthetic hedge funds in form of higher liquidity and more transparency. As empirical evidence on the performance of these products is weak due to their short history, the present study sheds light on several aspects of synthetic hedge funds and extends previous research.

To the best of our knowledge, we analyze the largest sample by number of considered synthetic hedge funds and by number of monthly observations to date. Besides the overall performance of this new asset class, we are the first to investigate the question of whether mutual funds or exchange-traded funds are better suited for achieving hedge fund-like returns. Furthermore, we examine the performance of synthetic hedge funds on a single strategy basis. We argue that the hedge fund universe is very heterogeneous and an overall performance comparison should be interpreted with caution. Standard hedge fund indices might not have the same style composition as the investigated sample of synthetic hedge funds. In addition to using self-constructed benchmark indices that match the style composition of our sample, we investigate both approaches of synthetic hedge funds: the factor-based approach (by using factor models and tracking errors) and the payoff distribution approach (by testing return distributions).

The remainder of this study is organized as follows. Section 2 provides a theoretical overview of synthetic hedge funds and the two most popular replication approaches. Also included is a literature review regarding the empirical performance of synthetic hedge funds. Our unique dataset of 72 commercially available synthetic hedge funds and the portfolio construction are described in Section 3. Section 4 provides our empirical results as well as robustness tests. Finally, Section 5 summarizes our main results.

2. Theoretical considerations

2.1. Development of synthetic hedge funds

Based on the insights gained by the numerous efforts in modeling hedge fund returns, the idea of replicating hedge fund returns has emerged and quickly gained popularity. As the names "hedge fund replication" or "hedge fund clones" suggest, this refers to a set of statistical models or algorithmic trading strategies, which aim to replicate or clone hedge fund returns. One of the initial ideas behind these products was that they would be to hedge fund investments what index funds have been to equity investments: a highly liquid and low-cost exposure to the hedge fund asset class. The motivating forces behind the need to clone hedge funds are rooted within the hedge fund universe: Since the very beginning, investors approach hedge funds not only because of the claim to generate absolute returns, but also in search of investment products with low correlations to traditional assets. Amongst others, however, those investors have to cope with an exceptionally high fee burden, a severe lack of transparency, illiquidity problems due to lock-up and redemption periods, and last but not least, a high minimum investment. For these reasons, it can be concluded that a

demand for achieving hedge fund returns, without being exposed to the severe drawbacks mentioned, has always existed. The opaqueness of the hedge fund industry in combination with the lack of any satisfying approach to model its returns left investors no choice other than to cope with the drawbacks and achieve the returns through a classical hedge fund investment. This picture has been subject to profound changes since the first academics proposed the decomposition of hedge fund returns. Provided with these models and the finding that "a large proportion of the variation in hedge fund returns can be explained by market-related factors",[2] the only question remaining is which traditional and alternative market (beta) factors have to be chosen to approximate the desired hedge fund returns.

Since their introduction, replication products have often been marketed with the claim of offering several advantages. Synthetic hedge funds claim to be more transparent and more liquid than hedge funds while they contain no manager-specific risk. Furthermore, those products charge lower fees, have lower minimum investments, and have no lock-up period. Although lower fees without doubt benefit investors, some of the other advantages might also work against investors. Mutual funds and exchange-traded funds are usually strictly regulated by authorities and are obligated to offer their investors detailed information on a regular basis. Nevertheless, replication models are typically sophisticated and complex, which gives some doubt to the gain in transparency. Even though high liquidity is desirable per se, bearing liquidity risk may be beneficial at times. For instance, if an investor wants to extract the risk premium paid for the illiquidity of a particular asset, illiquidity has its positive aspects. Hence, excluding illiquidity is not positive by default. Besides the aforementioned advantages, synthetic hedge funds – which are arranged as mutual funds or exchange-traded funds – can sometimes be shorted and therefore lead to new hedging possibilities. For instance, analogous to hedging equity exposure by short-selling the respective stocks, exposure to hedge funds could be hedged with a clone that replicates its return time series.

Despite those advantages, synthetic hedge funds have just started their growth after the financial crisis. As Fig. 1 shows, the assets under management and the number of funds in our sample of synthetic hedge funds have dramatically increased since 2009. The growth of both dimensions is very steady, with hardly any drawbacks. As of the end of 2013, our sample covers around 60 synthetic hedge funds with a total of over eight billion US dollars in assets under management.

Altogether, one can argue that Fig. 1 shows the rising of a new asset class, as an almost ever-increasing amount of money is committed to synthetic hedge funds.

2.2. Approaches

The statistical models or trading strategies can either aim at replicating the time series of returns directly with factor models (factor-based approach) or indirectly by replicating the distributional properties of hedge fund returns (payoff distribution approach).[3]

2.2.1. Factor-based approach

Replication approaches based on linear factor models are closely linked to the decomposition of hedge fund returns. Basically, the goal

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[2] Fung, Hsieh, Naik, and Ramadorai (2008), p. 1777.

[3] The reverse engineering approach – where hedge fund strategies are reconstructed in a bottom-up approach – is usually considered as a third possibility to replicate hedge fund returns. Mitchell and Pulvino (2001) give an example, employing a synthetic "Merger Arbitrage" strategy on a dataset of merger deals between 1963 and 1998. Merger arbitrage hedge funds are known to bet on the outcome of merger negotiations between two firms when there is a spread between the target firm's current stock price and the acquirer's bid price. In order to hedge market risk and only earn returns from the contraction of the spread, a long position in the target firm and a short position in the acquiring firm of the merger deal is established. By applying this strategy to their dataset, the authors are able to explain a significant part of the returns of merger arbitrage hedge funds. However, as these reverse engineered strategies are typically employed within the framework of factor models, we do not consider them to be a separate approach.