

Hannu Kahra (ed.)

## Hedge funds in portfolios of earnings-related pension investors

This report offers the reader an overview of hedge funds from three central perspectives: (1) a presentation of hedge fund characteristics, (2) a review of how hedge funds may complement a traditional investment portfolio, and (3) a presentation of the core issues connected to the choice of fund.

Hedge funds emphasize investment strategies with the aim of absolute return, where the most important success factors are the applicable investment style and the skills of the portfolio manager. Strategies employed by hedge funds include, for example, derivatives, short selling, leverage, share retirement limitations and significant bonuses for portfolio managers.

For these reasons, hedge funds differ from traditional investment funds. The most central characteristic of this field is that there is no statutory reporting obligation for hedge funds. As a result, any information reported by the funds to various commercial databases is voluntary. This means the quality of information can be questioned.

According to the academic viewpoint, illusions related to the databases should be taken into account when analyzing information. The quality of information has great impact on the understanding of investors and researchers regarding the success and risks of hedge funds. When evaluating hedge funds, it is important to take into account the possible impact that survival and back filling illusions have on return observations. As a result of the management of non-liquid investments, the time series of returns in hedge funds are often auto-correlated, which gives the illusion of decreasing the fluctuation in fund returns and raising the risk-

amended level of return. The autocorrelation is affected by the right of hedge funds to evaluate non-liquid assets at their own discretion.

The challenge of hedge funds is to evaluate system, market, liquidity and tail risks based on return data. The core factor in evaluating system risk is the indebtedness of hedge funds, the features of which change over time and are often challenging to evaluate based on information in commercial databases.

Essential from the perspective of liquidity risk is the relationship between the liquidity of the investment portfolio of hedge funds and the share retirement limitations applied by the funds. In evaluating the tail risks of hedge funds, the analyst should take into account possible anomalies from the normal distribution of return series. Abnormal return distributions affect both the evaluation of fund risks and the optimization of the investment portfolio. Following the financial crisis, changes made to the legislation applicable to hedge funds mostly concern taking system risks into account. The aim is to improve the transparency of the field.

According to surveys conducted, a significant number of institutional investors consider increasing the share of hedge funds in their investment portfolios. Among the most important arguments are low correlations with current asset categories, diversification benefits and the aim of absolute return. Lessons learned from the financial crisis are thus apparent in how investors choose to act. Combining hedge funds into the optimal portfolio is a challenging task. First of all, special expertise is needed in selecting the funds. Secondly, a regular Markowitz model is not applicable to the optimization. This is due to, among other reasons, the statistical features of the hedge funds.

By combining hedge funds with a regular investment portfolio, the risk/return ratio of the optimal CVaR-efficient portfolio is usually better than that of a portfolio containing no hedge funds. In addition to this, all risk figures of the optimal portfolio, especially key figures describing downturn risks, are smaller than in the comparison portfolio. The behaviour of the comparison portfolio and hedge funds applying global macro strategies may be simulated by applying statistical risk factors. Most risk factors are formed from indexes into which it is also possible to invest. This enables the replacement of the hedge fund component with an "in-house" hedge fund that applies either passive or active investment strategies. Many risk factors can also predict future returns. Factors predicting returns may be applied in investment portfolio risk management.

Several surveys show that differences in success between hedge funds (i) are very large, that (ii) their success is strongly dependent on both the state of the macro-economy and the characteristics of the funds and life cycle timing, and that (iii) bankruptcies can best be explained by operational risks.

Various external analyses of a sample of research show that – at least in theory – regardless of the strict conditions placed on share retirement, even long-term investors such as pension

providers are able to choose hedge funds for their portfolio, which likely improves the risk/return ratio of the investments. Measuring and predicting the success of hedge funds can be done by applying various statistical indicators. They can be used to explicitly and implicitly control the risk sensitivity of hedge funds. By applying indicators, it is also possible to take into account problems relating to nonlinear risks and the stabilizing of returns.

Successfully choosing a hedge fund requires a considerable effort and expertise from the pension providers, the use of consultancy services as well as possibly making investments in databases and programmes that enable data analyses.

A thorough due diligence process is expensive, but is of valuable assistance in clarifying the operational risks of hedge funds and finding suitable hedge funds. Large investors with sufficient resources have the opportunity to benefit from scaling benefits in selecting hedge funds. Smaller pension investors may outsource their choice of hedge fund to a fund that is specialized in investing on behalf of other funds.

Research shows that the characteristics of hedge funds offer basic information that is worthwhile taking into account when making investment decisions. With regards to the performance fee, investors have reason to demand that a high water mark provision be applied. This is an efficient way of combining the benefits and interests of investors and hedge fund managers. Based on empirical results, the existence of a high water mark has a positive impact on the risk-adjusted returns and decreases the funds' risk of bankruptcy.

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**More information:**

Professor Hannu Kahra  
Oulu University  
E-mail: [hannu.kahra@oulu.fi](mailto:hannu.kahra@oulu.fi)  
Telephone: +358 44 357 6881

**Ordering of publications:**

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