Holdings Concentration and Hedge Fund Investment Strategies

Overview

In [*Holdings Concentration and Hedge Fund Investment Strategies*](#),
published in the Spring 2020 issue of *The Journal of Alternative
Investments*, **Xiaohui Yang** (**Fairleigh Dickinson University**) and
Hossein Kazemi (**University of Massachusetts Amherst**) investigate
whether hedge fund managers are skilled stock pickers and can earn
abnormal risk-adjusted returns. By focusing on the proportion of a
stock that a hedge fund holds relative to the stock's proportion in its
benchmark, the authors note that the concentrated stocks outperform
the least-concentrated stocks under most conditions. The analysis
provides insights on market efficiency because certain stock prices
do not immediately reflect publicly available holdings information.
The study considers the relative performance of small-cap and large-
cap stocks with high holding concentrations in crisis and non-crisis
conditions. By simulating strategies based on holding concentrations,
the authors examine risk-adjusted returns as well as downside risks.
They conclude that investors can potentially use publicly available
hedge fund information to create a profitable investment strategy.

Practical Applications

- **Stocks with high holding concentration measures outperform
  stocks with low concentration measures during non-crisis
  periods.** This effect is stronger for small-cap stocks than large-cap
  stocks.
- **Mimicking hedge funds' concentrated positions can provide
  investors with profitable opportunities during non-crisis
  periods.** Registered hedge funds disclose their holdings publicly
  every quarter.
- **Stocks with high holding concentration measures underperform
  stocks with low concentration measures during crisis periods.**
  This effect is stronger for small-cap stocks than large-cap stocks.
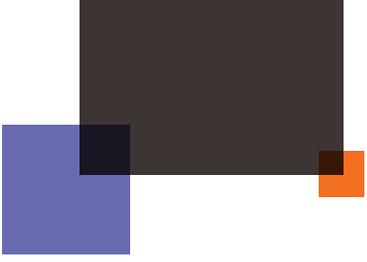
Key Definitions

Holding concentration (HC)

The measure of holding concentration for a particular stock in a single hedge fund is its weight in the fund subtracted by the weight of the stock in its benchmark. The holding concentration (HC) measure for a stock, as defined in the article, is an average of its concentration measures across all hedge funds in the sample.

13F filing (SEC Form 13F)

A 13F filing lists all long positions in exchange-traded equities and certain other types of securities held by an institutional investment manager. Institutional investment managers must file Form 13F with the Securities and Exchange Commission (SEC) quarterly, within 45 days of the end of the quarter.

Cornish–Fisher expansion

The Cornish–Fisher expansion is a mathematical technique for estimating the quantiles of a probability distribution (e.g., quartiles or percentiles) based on its first four moments. It is useful when the normal distribution may not be appropriate.

Discussion

Yang and Kazemi examine the information content in hedge fund positions. Specifically, they examine the stock concentrations of hedge funds and their relationship with the stocks' returns. If a stock's concentration measure is high, it means hedge funds tend to overweight the stock relative to a benchmark index. The authors show that stock returns are positively related to their hedge fund holdings concentration, implying that hedge fund managers are skilled at picking stocks and that there is valuable information contained in the consensus stock choices of hedge fund managers.

DATA

The study covers the period from 1994 to 2018 and uses monthly stock market data from the Center for Research in Security Prices (CRSP) database. The authors created a list of hedge funds in the Center for International and Derivative Securities Markets (CISDM) database and on Bloomberg and screened out certain funds, such as closed-end funds and real estate investment trusts. For the hedge funds identified, they obtained quarterly holdings from 13F filings. They classified the stocks as small-cap or large-cap by matching them to the component stocks of the Russell 2000 Index and the S&P 500 Index, respectively. They excluded stocks priced under $5. The resulting holdings data came from 319 hedge fund companies and included 677 large-cap stocks and 1,855 small-cap stocks.

HOLDING CONCENTRATION SUMMARY STATISTICS

When they sorted the large-cap stocks into quintiles, the authors found the average holding concentration (HC) of the lowest quintile was 0.114%, and the average HC of the highest quintile was 4.376%. The bottom- to top-quintile spread for the large-cap change in holding concentration (ΔHC) was negative 1.481% to positive 1.665%. The results for the small-cap stocks were similar, but the differences between the top and bottom quintiles were larger.

FORMATION OF PORTFOLIOS

The authors formed five portfolios by sorting the large-cap stocks by their holding concentration (HC) into quintiles each quarter and equally weighting the stocks in each quintile. They repeated

Carhart Four-Factor Model

The Carhart four-factor model is a model to explain stock returns based on the following four factors: (1) market risk, (2) company size, (3) the ratio of an issuer's book value to its market value, and (4) the tendency for prices to continue moving in the same direction once they have started moving. The Carhart four-factor model is an extension of the Fama–French three-factor model, which is based on the first three of the factors.

the procedure to create five small-cap stock portfolios. They also created five small-cap and five large-cap stock portfolios based on the ranking of the change in holding concentration (ΔHC). Much of their analysis examined the difference between measures for the portfolios with the highest and lowest HC and the largest and smallest ΔHC.

MAIN RESULTS

The table of small-cap monthly raw and risk-adjusted portfolio returns displayed in Exhibit 1 is a small subset of the tabular results in the full article, but it is representative of the analytic approach and base results. The risk-adjusted alphas are for the capital asset pricing model, the Fama and French (1993) three-factor model, and the Carhart (1997) four-factor model.

Exhibit 1 shows that the differences in the raw and risk-adjusted returns of the highest and lowest quintiles are all very statistically significant. It also demonstrates that the differences between the returns in the highest and lowest quintiles are larger for those portfolios sorted by the change in holding concentration (ΔHC) than for those sorted by the absolute holding concentration measure (HC).

Exhibit 1: Small-Cap Stock Monthly Raw and Risk-Adjusted Portfolio Returns (%)						
	Sorted by HC			**Sorted by ΔHC**		
	Lowest	**Highest**	**Hi-Low**	**Lowest**	**Highest**	**Hi-Low**
Raw Return	1.023	1.416	0.393***	0.947	1.558	0.611***
CAPM alpha	0.114	0.328	0.214***	-0.090	0.516	0.606***
FF alpha	0.031	0.296	0.265***	-0.081	0.443	0.524***
Carhart alpha	0.103	0.379	0.276***	0.022	0.551	0.529***

Note: The left half of this table shows the raw return, capital asset pricing model (CAPM) alpha, Fama and French (1993) three-factor model (FF) alpha, and Carhart (1997) four-factor model (Carhart) alpha for the portfolio based on the lowest quintile sorted by the holding concentration (HC), the highest quintile sorted by HC, and the difference between the highest and lowest quintiles sorted by HC. The right half of the table provides the same information for portfolios sorted by the change in the holding concentration (ΔHC). The differences between the returns for the lowest and highest quintiles are all statistically significantly different from zero at the 1% level—denoted by ***.

The analogous results for portfolios of large-cap stocks (not reported here) are very similar, in that the differences between the returns of the highest and lowest concentration quintiles are all statistically significantly different from zero at the 1% level, but the magnitude of the difference in large-cap portfolios is not as large as that of the small-cap portfolios reported here.

> ❝ These results suggest that there is substantial advantageous information contained in positions concentrated in hedge funds. ❞
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EXTENDED RESULTS

After establishing that the information content of positions concentrated in hedge funds at any point in time (HC) is valuable, and the information relayed by the one-period change in positions over time (ΔHC) is even more valuable, the authors investigated 1) the persistence of the investment value of the holdings information content over multiple months, 2) the downside risks of the portfolios formed based on holding information, and 3) the relative performances of small- and large-cap strategies based on holding information in crisis and non-crisis periods.

They examined persistence in the abnormal performance of the returns of a long–short strategy based on going long high HC or ΔHC stocks and shorting the low HC or ΔHC stocks, while lagging the holding information for one to six months. For large-cap stocks ranked by HC, the Carhart four-factor alpha remained significant at the 1% level for two lags; when ranked by ΔHC, it remained significant at the 5% level for three lags. For small-cap stocks ranked by HC, the Carhart four-factor alpha remained significant at the 1% level for three lags, and when ranked by ΔHC, it remained significant at the 5% level for four lags.

> ❝ The long–short strategy on small-cap portfolios sorted by ΔHC implemented with a lag of four months earns 0.160% abnormal returns at a 5% level. As such, copycatting hedge funds' positions right after their public disclosure, especially in small-cap stocks, may provide investors with profitable opportunities. ❞
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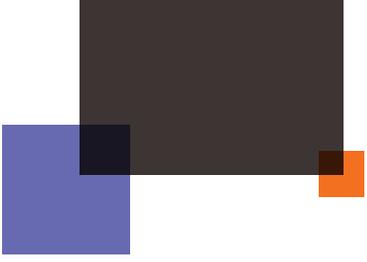
The authors examined portfolio downside risks by calculating value-at-risk (VaR), expected shortfall (ES), and tail risk (TR) across rolling 60-month windows. Each of these measures used the Cornish–Fisher expansion since return distributions are unlikely to be normal. Hedge funds' use of leverage, short positions, and concentrated positions often results in skewness or excess kurtosis, both of which are inconsistent with normal distributions. The results indicate that small-cap portfolios based on hedge fund holding concentrations have more downside risk than large-cap portfolios formed in the same manner. This result is consistent with efficient markets, where stocks with higher expected returns contain higher exposures to risk.

There are two crisis periods during the 1984 to 2018 sample period: following the tech-stock bubble from 2001 to 2002, and the 2007 to 2009 financial crisis. By dividing the sample into crisis and non-crisis periods, Yang and Kazemi find that the riskier concentrated small-cap stock strategy underperformed the large-cap strategy during crisis periods.
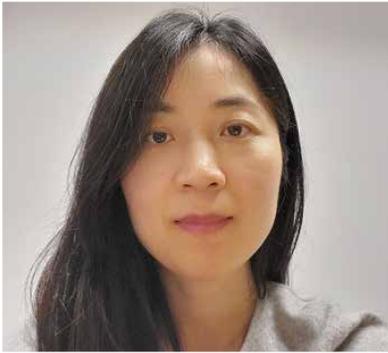
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