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A unique view of hedge fund derivatives usage: Safeguard or speculation?☆

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ABSTRACT

We study the common equity and equity option positions of hedge fund investment advisors over the 1999–2006 period. We find that hedge funds' stock positions predict future returns and that option positions predict both volatility and returns on the underlying stock. A quarterly tracking portfolio of stocks based on publicly observable hedge fund option holdings earns abnormal returns of 1.55% through the end of the quarter. Net of fees, hedge funds using options deliver higher benchmark-adjusted portfolio returns and lower risk than nonusers. The results suggest that hedge fund positions reflect significant timing and selectivity skill.

1. Introduction

How derivatives are used by investment managers is still largely an open question in the finance literature. The few available empirical studies highlight nonspeculative uses. Koski and Pontiff (1999) find that derivatives are used by mutual funds to reduce fluctuations in portfolio risk, especially systematic risk. In another study of US mutual funds, Deli and Varma (2002, p. 97) conclude that "[the] primary benefits associated with … derivatives are the potential to economize on trading costs, costs of liquidity-motivated trading, and the opportunity costs of holding cash." These activities neither imply nor are implied by managerial informed trading about stock fundamentals. In this paper, we directly examine whether derivatives also play a speculative role in institutional portfolios by studying the common stock and equity option holdings of a large sample of hedge fund investment advisors over the 1999–2006 period.

The hedge fund industry provides an attractive setting in which to study speculative motives for holding derivatives. Hedge funds are different from mutual funds because they are largely unregulated and can implement diverse trading strategies using several types of securities. Hedge funds could, therefore, use derivatives broadly to earn higher returns on information production. In contrast, mutual funds must comply with the Investment Company Act of 1940, and its provisions make using

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derivatives difficult in practice. Many mutual funds also voluntarily adopt outright prohibitions on the holdings of individual equity options.[1] Therefore, a hedge fund setting will better enable detection of speculative motives if they exist.

Restrictions on derivatives might be burdensome for all managers but would be the most inhibiting for any subset of managers with the capacity for informed trading. To the extent those best informed are attracted to the less restricted hedge fund industry, our approach is well suited to study the role of derivatives in informed trading. Equity options are an obvious potential vehicle for exploiting volatility timing, that is superior knowledge about stocks' volatility. Calls and puts are also a high leverage channel through which an investor can profit from selectivity skill, that is information about the direction of the underlying stock price (see, e.g., Black and Scholes, 1973; Merton, 1973; and Cox and Rubinstein, 1985).

We report several new empirical findings. First, we examine the well-publicized case of the Nasdaq technology bubble. Brunnermeier and Nagel (2004) report that hedge funds heavily invest in high-priced tech stocks over the period 1999–2000. Our sample confirms this pattern in stock holdings, but we also find that the technology sector constitutes nearly half of the total notional value underlying aggregate hedge fund put holdings. Thus, as volatility increases over the summer of 2000, the hedge funds effectively win doubly, from both price direction and volatility.

Second, we undertake a comprehensive investigation into volatility timing ability as revealed by hedge funds' holdings of options over the period 1999–2006. Whereas, in general, Black and Scholes implied volatilities overestimate subsequent realized volatilities, we show a clear pattern in which hedge funds' nondirectional option strategies (e.g., protective puts and straddles) are associated with an attenuation or outright reversal of this effect. For example, we estimate that the difference between realized and implied volatility is -3.84% per month among securities for which no advisors hold corresponding option positions. In stark contrast, this difference is $+5.36\%$ when all advisors using the security do so as part of a nondirectional option strategy. When hedge funds report holding options, volatilities tend to increase.

Third, we test the selectivity skill revealed by advisors' stock and option holdings through measurement of subsequent abnormal returns in the underlying stocks. We find that stock positions predict future returns, especially when held in focused portfolios that contain relatively few stock positions. In addition, we find that call and put option positions reflect strong selectivity skill. Specifically, a call-minus-put portfolio that buys (sells) stocks underlying call (put) holdings earns average abnormal returns of 1.62% per month over the three months following each quarter end.

Fourth, we analyze how quickly the directional information contained in option holdings is reflected in security prices. Typically, a significant lag exists between quarter end and the public filing date. We exploit this feature of the data and partition the sample depending upon whether or not the holdings disclosures are yet publicly observable. A portfolio that buys (sells) stocks underlying call (put) holdings the day *after* the filing date earns average abnormal returns of 1.55% through the end of the quarter. These returns are calculated before any transaction cost but are based upon publicly available disclosure information. Therefore, this evidence would potentially qualify as a rejection of the joint hypothesis of semi-strong form market efficiency and the benchmark employed.

Finally, we examine whether the apparent informed character of hedge funds' option holdings contributes to the success of their constituent investors. We find that option usage is associated with significantly lower after-fee return volatility and higher Sharpe ratio. Moreover, hedge funds deliver higher benchmark-adjusted portfolio returns and lower market risk during quarters that immediately precede and follow greater reported option usage. For example, we estimate that an increase in directional put positions from 0% to 10% is associated with a 35 basis point increase in monthly excess returns. Taken together, our findings suggest that hedge funds use option holdings to profit from volatility timing information and selectivity skill, and these rents are largely passed through to investors in the form of after-fee returns.

Our findings broaden those of two recent studies of hedge funds' common stock holdings: Griffin and Xu (2009) and Brunnermeier and Nagel (2004). Our data are collected from original US Securities and Exchange Commission (SEC) filings instead of the commercially available Thomson Financial and CDA/Spectrum database that omits the call and put holdings disclosures. Griffin and Xu (2009) find that hedge fund stock positions are not predictive of future benchmark-adjusted stock returns and, therefore, call into question existing evidence that hedge funds generate alpha (see, e.g, Kosowski, Naik, and Teo, 2007; and Agarwal and Naik, 2004). Unlike option positions, however, many advisors consistently report hundreds of different stocks being held in their 13F filings. This could make it difficult to detect stock selection skill because very broad holdings of stocks might be less likely to be based on significant firm-specific information. Our findings suggest that informed trading by hedge funds is both statistically and economically significant in holdings that plausibly reflect concentrated bets, such as option positions and stocks held in focused portfolios.

Our findings also significantly extend evidence suggesting that option market data are informative about the probability distribution of future stock prices. While the option data used in existing studies are market volume aggregates that include both uninformed and informed trades, our sample includes only holdings likely to be informed.[2] Pan and Poteshman (2006, p. 873) conclude that the predictability

[1] See, e.g., Almazan, Brown, Carlson, and Chapman (2004). The act provides segregation requirements to avoid senior security issues, diversification requirements, limits on illiquid investments, compliance procedures to monitor derivatives use, increased disclosure, and the daily valuation of net assets. Although hedge funds are largely unregulated, advisors are subject to regulations such as portfolio disclosure rules.

[2] See, e.g., Kumar, Sarin, and Shastri (1992), Chakravarty, Gulen, and Mayhew (2004), Easley, O'Hara, and Srinivas (1998), Cao, Chen, and Griffin (2005), Pan and Poteshman (2006), Mayhew, Sarin, and Shastri (1995), and Fleming, Ostdiek, and Whaley (1996). More recently, Ni, Pan, and Poteshman (2008) find evidence that option market volume can predict subsequent stock market volatility.