Journal of Financial Economics 98 (2010) 54–71

Contents lists available at ScienceDirect

Journal of Financial Economics

journal homepage: www.elsevier.com/locate/jfec

Liquidity risk and the cross-section of hedge-fund returns[☆]

Ronnie Sadka

Boston College, Carroll School of Management, Chestnut Hill, MA 02467, USA

ARTICLE INFO

Article history:
Received 6 July 2009
Received in revised form
29 September 2009
Accepted 27 October 2009
Available online 11 May 2010

JEL classification:
G12
G14
G23

Keywords:
Liquidity risk
Hedge funds
Price impact
Asset pricing

ABSTRACT

This paper demonstrates that liquidity risk as measured by the covariation of fund returns with unexpected changes in aggregate liquidity is an important determinant in the cross-section of hedge-fund returns. The results show that funds that significantly load on liquidity risk subsequently outperform low-loading funds by about 6% annually, on average, over the period 1994–2008, while negative performance is observed during liquidity crises. The returns are independent of the liquidity a fund provides to its investors as measured by lockup and redemption notice periods, and they are also robust to commonly used hedge-fund factors, none of which carries a significant premium during the sample period. These findings highlight the importance of understanding systematic liquidity variations in the evaluation of hedge-fund performance.

© 2010 Elsevier B.V. All rights reserved.

1. Introduction

Over the past decade the asset-management industry has experienced a tremendous growth of hedge-fund asset value, peaking at $1.93 trillion at the end of June 2008. Much of the finance literature about hedge funds has focused on understanding their risk-reward relation. Unlike asset-pricing models developed for equities or fixed-income securities, the risk attribution for hedge funds is more complex because they could hold a variety of asset classes and typically apply sophisticated financial instruments, oftentimes with illiquid securities. For example, many hedge funds implement dynamic trading strategies that could lead to time-varying risk exposures. Fung and Hsieh (1997, 2001) and Agarwal and Naik (2004) find that option-based factors can be used to control for dynamic risk exposure. The performance analysis of hedge funds therefore typically considers linear multi-factor models that include exposures to a range of equity, bond, commodity, and option-based indices.

Recent events such as the Quant crisis of August 2007 (see, e.g., Khandani and Lo, 2007, 2008) and the financial crisis of fall 2008 have raised questions about understanding of hedge-fund risks. Much of the debate surrounding the risk-reward relation is the amount of a fund's returns that are attributable to alpha versus beta,

---

[☆] I would like to thank George Aragon, Tarun Chordia, Robert Korajczyk, Geoffrey Lasry, Ruslan Goyenko, Xiaoxia Lou, Yigal Newman, Gideon Ozik, Jeffrey Pontiff, Jun Qian, Efraim Sadka, Gil Sadka, Ingrid Tierens, Matthew Rothman, Christof Stahel, Federal Deposit Insurance Corporation's (FDIC) Center for Financial Research discussant, and Akiko Watanabe, National Bureau of Economic Research (NBER) discussant, for helpful comments and suggestions. I also appreciate the comments of seminar participants at NBER/Microstructure meeting, University of Massachusetts at Amherst, CREST-INSEE in Paris, Institutional Investors 15th annual conference (special session), 2nd Annual Hedge Fund Conference in Paris, FDIC's Center for Financial Research fall workshop 2009, INQUIRE-Europe Spring Meeting 2010, Analytic Investors, Boston College, Center for Asset Management at Boston College board member meeting, and Citigroup Quant Conference. I would also like to acknowledge financial support from INQUIRE-Europe and FDIC's Center for Financial Research. Special thanks are due to Mark Klebanov for extensive help obtaining the data. Any errors are my own.

E-mail address: sadka@bc.edu

0304-405X/$ - see front matter © 2010 Elsevier B.V. All rights reserved.
doi:10.1016/j.jfineco.2010.05.001

i.e., the manager's talent versus the exposure to systematic risk. This is especially important given the incentive and fee structure applied in the industry, which largely compensates the manager for skill and essentially assumes a fund's return is mostly due to alpha. Yet, the fact that recent market events have dramatically impacted many funds that have shown little prior exposure to systematic risk suggests that the risk model is incomplete. For example, even though August 2007 is considered a significant negative shock amongst many hedge-fund managers, the market return during that month was 0.74%, nothing special that would be indicative of a significant liquidity event.

This paper demonstrates that liquidity risk, as measured by the covariation of fund returns with unexpected changes in aggregate liquidity, is an important determinant in the cross-section of hedge-fund returns. Using aggregate measures of liquidity risk, this paper shows that funds that significantly load on liquidity risk subsequently outperform low-loading funds by about 6% annually, on average, over the period 1994–2008, while negative performance is observed during periods of significant liquidity crises. The performance is independent of the illiquidity of a fund as measured by lockup and redemption notice periods. These findings are also robust to risk controls such as the Fung and Hsieh (2001) factors and to portfolio rebalancing frequency. The results therefore highlight the importance of understanding systematic liquidity variations in the evaluation of hedge-fund performance.

It is important to emphasize that the focus of this paper is not on the asset-specific liquidity characteristic (the liquidity level), but rather on the concept of market-wide liquidity as an undiversifiable risk factor (the liquidity risk). The stock-price literature documents a premium as compensation for holding illiquid assets (e.g., Amihud and Mendelson, 1986, which uses bid-ask spreads to measure illiquidity, and Brennan and Subrahmanyam, 1996, which uses price impacts). In contrast, a few recent studies focus on the systematic component of liquidity (liquidity risk) instead of on its actual idiosyncratic level (i.e., liquidity level). This strand of literature begins with studies showing that firm-specific liquidity fluctuates over time and also that a significant systematic, or market-wide component exists to these liquidity fluctuations (see, e.g., Chordia, Roll, and Subrahmanyam, 2000; Amihud, 2002). Each using a different measure of liquidity, Pástor and Stambaugh (2003), Acharya and Pedersen (2005), and Sadka (2006) show that systematic liquidity risk is a priced risk factor; i.e., assets whose returns covary highly with aggregate liquidity earn higher expected returns than do assets whose returns exhibit low covariation with aggregate liquidity. To streamline the exposition, this paper mostly applies the Sadka (2006) liquidity factor and shows liquidity is priced in the universe of hedge funds as well. The measures of Pástor and Stambaugh (2003) and Acharya and Pedersen (2005) are also studied here. They exhibit similar results. Most important, independent of the measure used, the high-minus-low liquidity-loading portfolio underperforms during crisis periods and overperforms during noncrisis periods.

This paper measures liquidity risk using the funds' monthly reported return series. Because fund holdings are not readily available, it is not possible to compare this measured risk to the liquidity risk, as well as liquidity level, of the assets that the funds hold. Nevertheless, Aragon (2007) uses share restrictions, such as lockup and redemption notice periods, to proxy for fund illiquidity and shows that illiquid funds typically outperform liquid funds by about 4–7% per year.[1] To investigate the impact of share restriction on the liquidity risk findings here, funds are sorted into high- versus low-liquidity loading within each share restriction group. The results indicate that the premium for liquidity risk is apparent in most categories of share restriction (as proxied by lockup and redemption notice periods). The results therefore suggest that the liquidity a fund provides to its investors need not necessarily reflect on the fund's exposure to aggregate liquidity variations. This apparent imbalance of fund liquidity versus the liquidity of its assets is consistent with the observed practices of fund management during the financial crisis of fall 2008, as many liquid funds gated their assets in the face of significant redemption claims by investors.

The paper also distinguishes the liquidity risk factor from the commonly used Fung and Hsieh (2001, 2004) factors. First, risk-adjusted portfolio returns are computed throughout the paper using the Fung-Hsieh seven-factor model, which includes measures of access to credit and leverage (the model is slightly augmented by replacing the latter two factors by appropriate tradable portfolios). The returns to the high-minus-low liquidity-loading portfolio remain significant relative to this model, which further emphasizes the need for a liquidity risk factor, currently absent from typical models of hedge-fund performance. Moreover, the results suggest that none of the Fung and Hsieh factor loadings generates a significant return spread cross-sectionally over the sample period. In this context it is important to note that the Fung and Hsieh factors are originally designed to explain time-series return volatilities of hedge funds, not the cross-sectional variation of their expected returns. For example, these factors explain, on average, 54% of the time-series variation of investment-style index returns. Adding the liquidity factor only increases the explained variance by 2.5%. Yet, this factor generates a significant spread in the cross-section of hedge-fund returns. The reason could be that liquidity crises are infrequent yet violent. The infrequency suggests that the liquidity factor would not explain much of the time-series variation of returns, while the violence implies that the risk associated with liquidity crises is priced in the cross-section, despite the rarity of such crises.

Additional analysis and discussion are provided to highlight the significance of the results. First, the liquidity-risk strategies are analyzed across different investment styles. Although most style indices are sensitive to liquidity risk (for example, Convertible Arbitrage, Emerging Markets,

---

[1] Getmansky, Lo, and Makarov (2004) develop a return-based stale-price measure to proxy for the illiquidity of funds' assets. Aragon (2007) finds a positive correlation between this measure of illiquidity and lockup restrictions.

دریافت فوری ← متن کامل مقاله

ISIArticles
مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات