



Hedge fund liquidity and performance: Evidence from the financial crisis

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ABSTRACT

We investigate how share restrictions affect hedge fund performance in crisis and non-crisis periods. Consistent with prior research, we find that in the pre-crisis period more illiquid funds generate a share illiquidity premium compensating investors for limited liquidity. In the crisis period, this share illiquidity premium turns into an illiquidity discount. Hedge funds with more stringent share restrictions invest more heavily in illiquid assets. While share restrictions enable funds to manage illiquid assets effectively in the pre-crisis period, they seem insufficient to ensure effective management of illiquid portfolios in the crisis. In a crisis period, funds holding illiquid portfolios experience lower returns and alphas, also when share restrictions are controlled for. Funds with an asset–liability mismatch perform particularly poorly and experience the strongest outflows. Share restrictions are also a proxy for incentives as investors cannot immediately withdraw their money after poor performance. We show that higher incentive fees can offset the share illiquidity discount in the crisis period.

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1. Introduction

In this paper, we investigate how share restrictions, such as lock-up periods, redemption notice periods, and redemption frequency periods, affect hedge fund performance in crisis and non-crisis periods. Moreover, we investigate how share restrictions relate to the hedge funds' asset portfolio liquidity, relative fund flows, and incentives to shed some light on potential channels through which illiquidity premia and discounts may arise in non-crisis and crisis periods.

In a seminal study, Amihud and Mendelson (1986) find that stock returns are positively related to transaction costs measured by bid-ask spreads. Bid-ask spreads are a measure of liquidity. Hence, less liquid stocks offer investors an illiquidity premium. In the aftermath of Amihud and Mendelson (1986) many empirical studies, measuring liquidity in a variety of ways, analyze the relation between performance and liquidity for stocks, bonds, and mutual funds.¹ More recently, focus has turned on the relation between performance and liquidity of private equity and hedge funds.

Hedge funds provide an ideal environment in which to examine liquidity issues (Aragon, 2007). Many hedge funds impose restrictions on investor redemptions, thereby making hedge funds an

illiquid investment.² The market microstructure literature typically relies on transaction data from standardized exchange-traded equity securities which are extremely liquid assets. Transaction costs still matter in these highly competitive markets. However, their stochastic properties may have little bearing on the illiquidity risk premia that characterize the broader universe of investment opportunities available to investors (Khandani and Lo, 2011). Many hedge funds, however, invest in illiquid assets and generate a significant portion of their returns from bearing illiquidity risk. Moreover, hedge funds' share restrictions are easy to identify as they are directly observable from the fund's limited partnership agreement and available in various commercial databases. Hence, hedge funds are an ideal place to search for illiquidity premia.

In fact, several studies analyze the relation between share restrictions and hedge fund returns (Liang, 1999; Aragon, 2007; Bali et al., 2007; Liang and Park, 2007; Agarwal et al., 2009). All these studies find a positive relation between hedge fund performance and share restrictions indicating the existence of a share illiquidity premium in non-crisis periods. Recent studies also find a negative relation between share restrictions and asset portfolio liquidity (Aragon, 2007; Liang and Park, 2007; Khandani and Lo, 2011). Hence, share restrictions seem to provide fund managers

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¹ Amihud et al. (2005) provide a comprehensive literature review.

² On the contrary, mutual funds always provide investors an option to sell at the net asset value on the close of each trading day.

with greater managerial discretion and allow them to efficiently manage illiquid assets.

In this paper, we first investigate how share restrictions affect hedge fund performance in non-crisis periods as well as in a crisis period such as the recent financial crisis of 2007/2008. In robustness tests, we use a number of alternative (liquidity) crisis definitions including one that includes the Russian crisis and the collapse of Long-Term Capital Management (LTCM) in 1998 and the burst of the dot-com bubble in 2000 in addition to the recent financial crisis or all recession months as defined by the National Bureau of Economic Research (NBER). Moreover, we use the market-wide liquidity measure developed by Pastor and Stambaugh (2003) to measure liquidity crises more directly. Second, we investigate whether the use of alternative share restrictions, such as lockup periods, redemption notice periods, and redemption frequency periods, is correlated and whether share restrictions are used to prevent an asset–liability mismatch and, therefore, are significantly related to the hedge funds' asset portfolio liquidity as measured by the smoothing parameter of Getmansky et al. (2004). Third, we take into account both share restrictions and asset portfolio liquidity and investigate their joint effect on hedge fund performance both in crisis- and non-crisis periods. This allows us to separate the effect of share restrictions on fund performance from the effect of asset portfolio liquidity. Fourth, we focus on hedge funds with an asset–liability mismatch, i.e., funds holding illiquid asset portfolios combined with weak share restrictions, and analyze their performance in the pre-crisis and crisis periods. Fifth, we investigate whether share restrictions effectively prevented withdrawals of funds in the crisis. Finally, we analyze the relation of share restrictions, incentive fees, and hedge fund performance in crisis and non-crisis periods to investigate whether share restrictions are also a proxy for incentives.

Our main results are the following. First, we show that, consistent with Aragon (2007), in the pre-crisis period (his sample ends in 2001), more illiquid funds produce both higher returns and alphas. Hence, funds generate a share illiquidity premium for investors as a compensation for limited liquidity. In contrast, in the crisis period, this share illiquidity premium turns into an illiquidity discount. Thus, greater managerial discretion seems to be harmful in a severe financial market crisis. Second, our results show that the use of alternative share restrictions is positively correlated and funds using one of the three alternative share restrictions considered in this study are significantly more likely to use the other two share restrictions as well. Moreover, fund managers align share restrictions and asset portfolio liquidity to prevent an asset–liability mismatch. It is not unexpected that redemption notice periods have the strongest relation to both fund performance and asset portfolio liquidity because lockup periods expire and redemption frequency periods only restrict redemptions to a certain point in time. Third, we find evidence that in a crisis period lower asset portfolio liquidity is associated with lower hedge fund returns and alphas even after controlling for share restrictions. Moreover, our results show that asset portfolio liquidity cannot explain the share illiquidity premium and discount in the pre-crisis period and the crisis period. Hence, share restrictions are not only a proxy for the liquidity of the asset portfolios. Fourth, our results indicate that in a crisis, due to early redemptions triggering position closings at very unfavorable prices, the relation between asset portfolio liquidity and hedge fund performance is even stronger when share restrictions are weak. Hence, there is some evidence that share restrictions help funds with illiquid investments in the crisis and that funds with an asset–liability mismatch, i.e., illiquid asset portfolios and weak share restrictions, suffer particularly poor performance in a crisis. Fifth, we find the above results to be corroborated by an analysis of relative fund flows which shows that funds with an asset–liability mismatch, i.e., funds holding

illiquid investments combined with weak share restrictions, in fact suffer the strongest outflows in the crisis. However, the link between share restrictions and outflows in general is not very strong and unambiguous. Possible reasons for this finding are that margin calls and forced deleveraging are not prevented by share restrictions (Ben-David et al., 2012) and that investors anticipating future binding restrictions on withdrawal due to more rigorous share restrictions may redeem their invested money more strongly in response to poor performance (Ding et al., 2009).

Finally, we find that share restrictions are not only a proxy for asset portfolio liquidity but also for incentives. Hedge funds with stronger share restrictions and greater managerial discretion have fewer incentives to perform better because investors cannot immediately withdraw their money after poor performance. Agarwal et al. (2009) argue that the benefits of greater managerial discretion provided by stricter share restrictions are larger than the costs from missing incentives. While these missing incentives do not seem to matter in the pre-crisis period, they provide an explanation for why hedge funds with stronger share restrictions underperform funds with weaker restrictions in the recent financial crisis. We show that hedge funds with additional incentives in place to compensate for these weaker incentives provided by stronger share restrictions deliver superior performance in the crisis period. Thus, the share illiquidity discount observed during the crisis period can be overcome by installing appropriate incentives.³

The remainder of the paper is organized as follows. Section 2 provides a literature survey and develops six testable hypotheses. Section 3 describes the data and variables. Section 4 presents the empirical results. Section 5 concludes.

2. Literature review and hypothesis development

Liang (1999) argues that lockup periods effectively prevent early redemption, reduce cash holdings, and allow hedge fund managers to focus on relatively long horizons. In fact, Liang (1999) reports a positive and significant relation between lockup periods and hedge fund returns. Managers with longer investment horizons and higher flexibility can invest in arbitrage opportunities which take time to become profitable due to noise trader risk (De Long et al., 1990). Moreover, such managers might not be forced to engage in asset fire sales which have been shown to be harmful for both corporations (Pulvino, 1998) and mutual funds (Coval and Stafford, 2007). Aragon (2007) argues that share restrictions provide fund managers with greater managerial discretion and thus allow hedge fund managers to efficiently manage illiquid assets and that these benefits can be captured by investors as a share illiquidity premium. He presents empirical evidence consistent with this conjecture. The excess returns of hedge funds with lockup periods are approximately 4–7% per annum higher than those of funds without lockup periods. This finding is also confirmed in other recent studies reporting a positive relation between share restrictions and hedge fund performance (Bali et al., 2007; Liang and Park, 2007; Agarwal et al., 2009). Hence, as a starting point, we investigate whether there is an illiquidity premium in our more recent sample. The first hypothesis, which serves to confirm previous findings and ensure comparability of our dataset with datasets used in previous studies, therefore is:

H1. Hedge funds imposing share restrictions, such as for example lockup periods, offer investors an illiquidity premium.

³ Incentive fees are set by fund managers and skilled managers might be able to charge higher fees than less skilled managers. Hence, performance fees may not only proxy for incentives but also for hedge fund manager skills. Thus, the significantly higher crisis performance of funds with high performance fees might not only be driven by appropriate incentives in place but also by highly skilled managers.

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