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# Estimating the Premium for Hedge Fund Illiquidity

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# Estimating the Premium for Hedge Fund Illiquidity

## Executive Summary

The events of 2008 have re-emphasized the importance of the role liquidity plays in hedge fund investing. In this paper we consider a number of liquidity issues that investors face and the approach to them implemented at Prisma.

In allocating funds to managers, we assess our exposure to three types of potential illiquidity in our managers: (i) illiquidity of the hedge fund's assets, (ii) illiquidity due to lockups and gates, and (iii) illiquidity as a result of concentrated and control positions.

### 1. Illiquidity of assets

Are a fund's liquidity terms appropriate for the strategy being employed and the types of securities it may trade? Are the interests of the manager and all investors aligned, especially in a crisis? What potential conflicts can arise and how would they affect the investment?

A rigorous due diligence process should consider the structure of the investment vehicle as thoroughly as the investment opportunity itself.

*Throughout the due diligence process at Prisma, we look for a clear alignment of interests in the fund and assess potential conflicts when considering the overall investment case.*

### 2. Illiquidity due to lockups and gates

Hedge fund investors lose the option to redeem when they invest with a manager who has an initial lockup period or when a manager invokes a fund's gate provision. Investors should be compensated via a higher return premium, or lower fees, for forgoing this option.

Since 2006, we have been using a theoretical model that we developed to quantify the value of this lockup (the "lockup premium"). Like most standard options, the value of the premium increases with volatility of the underlying strategy. Therefore, the value of a lockup

restriction increases dramatically in crisis times, such as in 2008 when volatilities peaked sharply. Similar patterns apply to the liquidity premium for gates.

*As we believe volatilities will remain elevated in the medium term, we have been looking to reduce our allocation to managers with restrictive liquidity. Within our manager selection process the output from our model helps us to compare the merits of managers with different liquidity terms.*

### 3. Illiquidity as a result of concentration and control positions

Fund illiquidity can arise even in relatively liquid markets and strategies through the size and/or concentration of the manager's positions. We have adopted a qualitative framework to identify and assign penalties to managers overly exposed to these potential sources of illiquidity and reflect these penalties in allocating funds.

*In our portfolios we have re-sized or exited managers with liquidity mismatches as a result of these types of positions.*

## Introduction

The year 2008 was extremely turbulent for financial markets in general and, perhaps surprisingly, for hedge funds in particular as the market neutrality of their strategies turned out to be less absolute than they had optimistically expected.

Disappointing performance and a global withdrawal of capital from risk assets led to an unprecedented level of redemptions from both hedge funds and funds of hedge funds in the last quarter of 2008. This trend continued into the first quarter of 2009. The wave of redemptions highlighted a number of hedge fund liquidity issues many investors had not faced before. These events have caused investors to apply even greater scrutiny to the liquidity terms offered by funds and the potential impact of these terms on the success of their investments.

Constraints on liquidity deprive a hedge fund investor of the opportunity or option to redeem his investment and re-employ his money differently. There are several varieties of illiquidity, and in the following we describe our thinking at Prisma:

### 1. Illiquidity of assets

The starting point when looking at hedge fund liquidity is to examine the liquidity of the underlying securities in which the fund invests. Investors should be wary of an implicit asset-liability duration mismatch in a hedge fund's exposure when the manager trades in illiquid assets while offering its investors generous liquidity terms.

### 2. Illiquidity due to Lockups

It has become increasingly common for hedge funds to impose multi-year lockups on their investors. In 2007, Prisma<sup>1</sup> looked at the issues of hedge fund lockups from a theoretical perspective to assess the opportunity costs to investors of restrictions on redemption. In this note, we update our analysis to take account of the recent increase in hedge fund volatilities, and also extend our analysis to estimate the theoretical cost of gating.

### 3. Illiquidity as a result of concentration and control positions

Even with liquid underlying assets, managers can run into illiquidity problems through the size or concentration of their positions. We set out a qualitative framework that can help identify managers with such positions that can potentially lead to asset-liability liquidity mismatches.

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<sup>1</sup> Derman, E. *Journal of Investment Management*, 2007, vol. 5, No. 3: 5-15.

## Illiquidity of Assets

Financial securities range across a wide spectrum of liquidity – with large cap U.S. equities and futures at the most liquid end and privately held equity and debt at the most illiquid end. Market depth, bid-ask spread, trading frequency, type of exchange, number and diversity of buyers/sellers, price volatility, and transaction costs are just some of the factors that determine a security's liquidity profile, which continually changes. A hedge fund manager must assess the current and potential liquidity of each security traded, and how this may affect the overall fund.

When analyzing the liquidity terms offered by a hedge fund manager, there are a number of issues for hedge fund investors to consider. First and foremost, investors should analyze whether a fund's liquidity terms (lockup, redemption frequency and notice period) are appropriate for the fund's strategy and types of securities it may trade. For example, if a fund invests primarily in large cap U.S. equities and holds positions that reflect only a small portion of a stock's daily trading volume, the fund can safely offer good liquidity to investors (minimal/no lockup, frequent redemptions, etc.).

In contrast, a fund that invests primarily in illiquid instruments (OTC derivatives, small cap stocks, complex mortgage tranches, etc.) creates a potential asset-liability mismatch if it offers unrealistically generous liquidity terms to investors. Faced with significant redemption requests, it may be forced to limit redemptions by invoking a gate provision or suspend redemptions in full. In that case, the favorable liquidity offered by the fund may be illusory – unobtainable just when it is needed.

Hedge fund investors should also consider the profile of their fellow investors (or limited partners) in the fund. These investors may have a wide range of risk and return expectations for their investment, and distinctly different liquidity profiles. If the majority of a fund's clients have a short investment horizon, it increases the likelihood that the fund will face heavy redemptions at some future time (particularly in the event of a significant drawdown). The greater the illiquidity of the underlying securities, the more adverse the impact of these redemptions will be on all investors.

Some of the biggest culprits of these asset-liability mismatches in 2008 and Q1 2009 were, surprisingly, the larger institutionalized multi-strategy hedge funds. In pursuit of diversification and higher returns, these managers had moved into areas with low levels of liquidity while maintaining the generous liquidity terms offered to investors. The illiquid positions did not necessarily represent the majority of the fund's holdings, but when faced with large scale redemptions, a number of these managers chose to restrict investor liquidity through the use of side pockets, gates and other restrictions. They believed that selling the illiquid assets would unnecessarily damage the fund's returns, and selling only the liquid portions of the fund would be unfair to the continuing investors who would be left with a sub-optimal and illiquid portfolio.

Many single strategy manager funds that focused on illiquid areas of the market already had restrictive liquidity terms in place, appropriate for the assets they traded, coming into the 2008 crisis. These funds were therefore better positioned to manage redemptions without having to make a choice between selling illiquid assets at fire-sale prices or placing unexpected liquidity restrictions on their investors.

## Illiquidity due to Lockups

Over the past several years there has been a trend among hedge funds to offer less favorable liquidity terms. The reasons include increased institutional demand for hedge funds which has enabled top managers to demand less flexible investor terms; the now defunct SEC registration requirement, which exempted funds with a two-year lockup; and a gradual migration to more esoteric/less liquid strategies in search of new sources of return.

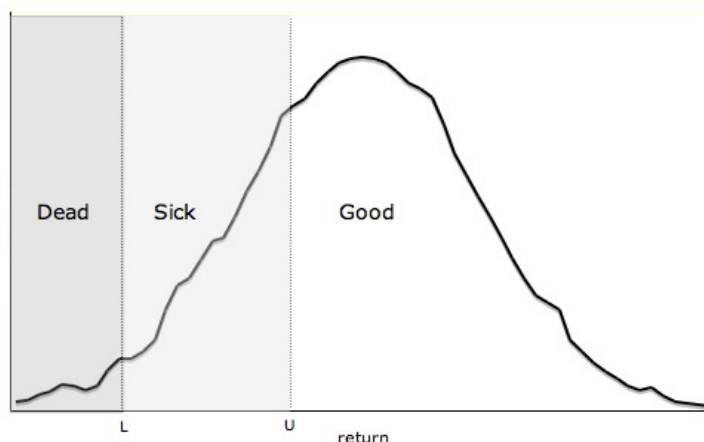
Callable corporate bonds must provide investors with a higher yield than similar non-callable bonds in order to compensate them for the option they provide to the issuer. Similarly, hedge fund investors, when faced with an initial lockup clause, should demand an excess return premium to compensate them for the loss of the option to redeem during the initial lockup period.

There are a variety of lost opportunities when investors cannot redeem. Since there is statistical evidence that the quality of funds' returns persists over time, an important casualty of a lockup is the ability to get out of a proven "bad" fund and then into a proven "good" one. As Prisma's original research indicated, the premium required to compensate investors for their inability to redeem from one fund and allocate to another fund in the same strategy group ranged from approximately 20 to 170 basis points per annum, depending on the strategy group. The theoretical value of the premium depends on the length of the lockup, the extent to which hedge fund returns in a given strategy display persistence from year to year, and, as with all options, the volatility of the strategy considered.

### Reviewing the Model for Lockup Premiums

Our model categorized hedge funds by the quality of their annual returns *relative* to other funds with the same strategy. Figure 1 displays a hypothetical distribution of returns for funds within a particular strategy group. We define "Good" funds as funds that have performed acceptably in the previous year, "Sick" funds as funds that have performed relatively poorly, and "Dead" funds as funds that have ceased operating owing to far below-average returns.

**Figure 1.** A hypothetical distribution of hedge fund annual returns for all hedge funds in a particular strategy. L is the level of returns that separates Dead from Sick funds. U is the level that separates Sick from Good funds. Each strategy has its own distribution of returns.



The option to redeem future Sick funds for future Good ones has value only if one can predict a fund's future state of health. Surprisingly, there is a demonstrated persistence to the quality of hedge fund returns: Good/Sick funds in the past tend to remain Good/Sick in the future.

For any hedge fund strategy in a given year, consider only those funds whose return relative to the mean return was positive in that year. We then define the persistence of that strategy as the average excess return of those funds in the next year divided by their average excess return in the given year. It represents the degree to which positive excess returns in a given year persist. The values of the persistence for a variety of strategies during the period 2000 – 2005 are shown in Table 1. The return data is taken from the TASS hedge fund database.

**Table 1.** The persistence for hedge fund strategies during the period 2000 – 2005.

Strategy	Average Current Year Excess Relative Return (%)	Average Next Year Excess Relative Return (%)	Persistence
Convertible Arb	7.3	2.8	0.39
Dedicated Short	16.4	7.1	0.44
Emerging Markets	19.9	7.2	0.36
Event Driven	8.3	1.4	0.16
Fixed Income	6.4	2.5	0.38
Global Macro	10.9	1.6	0.14
Equity Long/Short	14.1	1.5	0.11
Equity Market Neutral	6.3	0.8	0.12
Managed Futures	13.1	2.2	0.17

Source: TASS Hedge Fund Database

A fund of funds manager who can periodically redeem his investment in future Sick funds and reinvest the proceeds in future Good funds can increase the expected return of his portfolio. A fund with a lockup deprives the manager of this redemption option, and must provide a correspondingly higher expected annual return premium as compensation. We calculated the value of this redemption option using a simple discrete Markov chain model for describing the evolution of Good and Sick hedge funds. We calibrated the model's parameters to the observed persistence of hedge funds in Table 1 and to the observed rate of hedge funds' death. Table 2 displays the results for the two- and three-year lockup premium for each strategy.

**Table 2.** The estimated annual premium for two- and three-year lockups for different strategies based on their historical persistence and volatilities ( $\sigma$ ) in 2008.

Strategy	$\sigma$ (%)	Persistence	Premium (b.p. per year)	
			2-Year Lockup	3-Year Lockup
Convertible Arb	17	0.39	135	216
Dedicated Short	19	0.44	157	255
Emerging Markets	16	0.36	123	194
Event Driven	8	0.16	36	52
Fixed Income	16	0.38	126	200
Global Macro	12	0.14	48	69
Equity Long/Short	12	0.11	39	55
Equity Market Neutral	5	0.13	19	27
Managed Futures	12	0.17	57	82

Source: TASS Hedge Fund Database

In our model, the value of the lockup premium is directly proportional to the volatility of a strategy's returns. Return volatilities have increased sharply starting in 2008, which explains why these current lockup premiums are substantially higher than those in our original 2007 paper.

### Estimating the Cost of Gates

Estimating the premium an investor should receive for gate provisions is much more difficult, since it depends on the likelihood of the gate being invoked. Here we content ourselves with a rough estimate, assuming that the approximate effect of a gate is to delay by one year the redemption from a fund.

To illustrate, consider the case of Convertible Arbitrage in the top row of Table 2. Assume that the imposition of the gate converts a two-year lockup into a three-year lockup in the model described above, for the volatility and persistence values shown in Table 2.

- Had the gate not been invoked on the two-year lockup, an investor should have demanded an extra 135 b.p. per year for a total of 270 b.p. of return over two years.

- Had the gate been imposed and the lockup extended to three years, then, retrospectively, the investor should have demanded an extra 216 b.p. per year for a total of 648 b.p. per year over three years, which amounts to 378 b.p. total return over and above the 270 b.p. already expected as compensation for the two-year lockup.
- This 378 b.p. corresponds to an extra 189 b.p. per year for two years that would have served as compensation for the certain imposition of the gate.

Table 3 shows the results of the analogous calculation for all strategies in Table 2. It displays the premium that should have been required per year, over two years, for the certain imposition of a gate that will extend the lockup by one more year. The premium per year is substantial for strategies with high persistence.

To be fair, looking forward, one should weight these values by the probability of the gate being imposed, an estimate we leave to the reader. This probability factor would decrease the fair cost of the gate. On the other hand, under the crisis circumstances that might lead to the imposition of the gate, the volatility of strategy returns would very likely be temporarily higher, which would correspondingly offset the decrease due to the probability factor.

**Table 3.** The premium per year over two years required for the certain imposition of a gate, assuming that the effect of the gate is to convert a two-year lockup into a three-year lockup.

Strategy	$\sigma$ (%)	Persistence	Gate Premium (b.p. per year for two years)
Convertible Arb	17	0.39	189
Dedicated Short	19	0.44	226
Emerging Markets	16	0.36	168
Event Driven	8	0.16	42
Fixed Income	16	0.38	174
Global Macro	12	0.14	56
Equity Long/Short	12	0.11	44
Equity Market Neutral	5	0.13	22
Managed Futures	12	0.17	66

Source: TASS Hedge Fund Database

## Illiquidity as a Result of Concentration and Control Positions

Even when investing in relatively liquid securities, hedge fund managers can adopt positions whose size may cause liquidity problems. We characterize a **control position** as one in which a fund manager holds a relatively high percentage of a company's total outstanding shares and is therefore able to exert influence on the direction or make up of the company. We characterize a **concentrated position** as one which represents a relatively high percentage of the fund itself - taken due to a manager's inherent style or, on occasion, to a particularly high conviction in the eventual success of a trade. In either of these situations, a forced liquidation (if faced with large redemptions, for example) can heavily damage the fund.

Prisma has developed a common sense framework to limit our exposure to concentration and/or control positions when considering a new investment or monitoring an existing one. We look at a simple matrix of liquidity risk factors, as illustrated in Table 4 below. We define control positions as positions where a manager owns greater than 10% of a company's total outstanding share float, and we weight them with a penalty of 1. We define concentrated positions as those that comprise more than 10% of a fund's AUM [assets under management], weighted with a penalty of 2. Holdings that are both control positions and concentrated positions within a manager's portfolio are considered riskiest, and carry a penalty weight of 3. This simple scoring system helps to identify managers whose portfolios will be particularly sensitive to accelerated liquidation schedules.

**Table 4:** Concentration Risk Matrix

Fund	Control Position & Concentrated Position	Concentrated Position	Control Position	Total Score
Penalty Weight	3	2	1	
Fund 1	0	2	0	4
Fund 2	1	1	1	6
Fund 3	3	0	1	10
Fund 4	0	0	2	2
Fund 5	1	1	0	3
Fund 6	0	2	0	4
Fund 7	2	2	1	11

The fact that a manager gets a high score in this matrix is not automatically bad. It simply means that 1) there is a potential for an asset-liability mismatch if the manager offers overly generous liquidity, and 2) we require a higher rate of return, or an illiquidity premium, to justify including this type of manager in our portfolios.

## Conclusions and Portfolio Implementation

The events of 2008 have stressed the importance of liquidity for managers of all types of assets. Three of the principal sources of liquidity risk within a hedge fund portfolio can be categorized as:

### 1. Illiquidity of assets

Hedge fund due diligence must consider the structuring of the investment vehicle as thoroughly as the investment opportunity itself. For funds with illiquid underlying assets, we require a match between the fund's liquidity and those of its assets, and are wary of misalignments between the liquidity requirements of different investors.

#### *Implementation*

*Throughout our due diligence process, we look to ensure that there is full and clear alignment between the manager and all investors in a fund, particularly in times of stress. We also aim to identify any potential conflicts that may arise in the future and assess how they may impact the manager's returns when considering the overall investment case.*

### 2. Illiquidity due to lockups and gates

Investors should be compensated for fund lockup periods and gates via a higher return premium, or lower fees. It is clear that the size of this return premium (or fee discount) should increase as the length of the lockup increases from 1 year to 3 years but also, importantly, with the expected volatility of the underlying strategy. As such, the value of the lockup (or gating) increases dramatically in crisis times, such as 2008 when volatilities peaked sharply.

Based on 2008 actual volatilities, the theoretical cost of a three-year lockup can be as much as 255 b.p. per year, depending on the strategy.

#### *Implementation*

*Our model indicates that the dollar value of a lockup premium increases proportionally with expected volatility. Therefore, given that we believe volatilities will remain elevated in the medium term, we have been less inclined to roll forward manager lockups as they have become due, or appoint new managers with*

*long initial lockups. This is particularly the case with strategies where we feel restricted liquidity is not required.*

*Within our manager selection process we use the estimated liquidity premiums from our model to help decide between managers that may have different liquidity terms. We compare the minimum liquidity premium to the additional expected alpha and/or fee discount.*

### 3. Illiquidity as a result of concentration and control positions

For funds with illiquidity as a result of concentration and control, we have devised a qualitative penalty scoring system to identify and manage investments that may be overly exposed to these types of positions.

#### *Implementation*

*When sizing manager positions, Prisma has historically focused on the managers' gross and net exposures and expected volatility and correlation characteristics. Adding our qualitative scoring system has helped us to identify managers with potential asset liability mismatches due to such positions. We have since re-sized or exited managers with those characteristics, with relatively successful outcomes.*

## Appendix

### Common Liquidity Restrictions for Hedge Funds

#### Lockups

There are several common types of liquidity restrictions employed by hedge funds. A **lockup** provision stipulates that money allocated to a fund may not be withdrawn before the end of a specified period (often one year or more). A “hard lockup” precludes any withdrawals during the lockup period, whereas a “soft lockup” permits withdrawals during the lockup period subject to a penalty, typically a fee reflecting a percentage of the investor’s withdrawal. The rationale for a lockup is to ensure that the hedge fund manager has a stable capital base with which to implement his investment strategy. Forced trading based on investor flows can be detrimental to performance, especially if the manager holds illiquid assets. Furthermore, if a manager knows that his investor base may redeem at any time, it may impede the manager from taking sensible risks.

#### Redemption schedules

In addition to a lockup, many hedge funds restrict withdrawals to specified dates. Unlike open-ended mutual funds, which allow investors to redeem at the end of any business day, hedge funds often permit withdrawals only on a periodic (monthly, quarterly, etc.) basis. In addition, hedge funds typically require investors to notify them of their intent to redeem a certain number of days in advance. These restrictions are designed to mitigate the impact of forced selling to meet redemption requests by allowing the manager sufficient time to unwind positions.

#### Gates

Finally, many hedge funds have **gate** provisions that allow them to limit or suspend investor redemptions in the event those redemptions exceed a specified percentage of total fund assets. Similar to the notice requirement, gates are designed to prevent a situation where a manager is forced to liquidate a significant portion of his portfolio over a short time horizon under unfavorable market circumstances. This could have a significant negative impact on performance, particularly in an illiquid environment of the type we have experienced during the past year. In this respect, gates are designed to protect investors by permitting the manager to meet redemption requests over a longer period of time, rather than through a rapid fire sale.

## Notes

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