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WHO BENEFITS FROM FUNDS OF HEDGE FUNDS? A CRITIQUE OF ALTERNATIVE ORGANIZATIONAL STRUCTURES IN THE HEDGE FUND INDUSTRY (I)

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Abstract
This paper provides a critique of alternative organizational structures in the hedge fund industry. Our critique is facilitated by several stylized models describing alternative industry structures. The models include: (1) An inside-only hedge fund model; (2) A straddling hedge fund model; (3) A straddling "feeder" fund of funds (FOF) hedge fund model; (4) A stand-alone outside hedge fund; and (5) An outside "feeder" FOF hedge fund model. Our discussion of these models, which centers on benefits vs. fundamental problems related to illiquidity, information asymmetry, and conflicts of interest, leads to several hypotheses about the differential characteristics and return performance of both individual hedge funds and FOFs.
Keywords: Hedge funds, Funds of funds, Illiquidity, Information asymmetry, Conflicts of interest, Adjacency risk, Contagion, Return performance.

1. INTRODUCTION

Over the past 20 years, the hedge fund industry has experienced a tremendous boom-and-bust cycle. Regarding the boom, Stulz (2007) reports that: "In 1990, less than $50 billion was invested in hedge funds; in 2006, more than $1 trillion was invested in hedge funds" (p. 176). Citi (2010) reports that from 2000-2003, assets under management (AUM) increased 67.1%, from $490.6 billion to $820.0 billion, and increased an additional 135% to $1.93 trillion in the second quarter of 2008, when AUM peaked. Thereafter, however, the financial crisis took a heavy toll on AUM, as the industry experienced outflows of $151.7 billion and $103.3 billion in the fourth quarter of 2008 and first quarter of 2009, respectively.

Over time, one particular class of funds, namely funds of hedge funds (FOFs), steadily represented about a third of the industry.

Citi argues that the hedge fund industry grew after 2000 largely because of institutional investors' disillusionment following the busting of the 'dot-com' bubble: "As the technology boom of the late 1990s faded and market turmoil set in during the early 2000s, institutional investors' allocations to long-only equities and bonds failed to generate the returns many sought. As their liability gaps increased, institutional investors began to broaden their investment horizon and look increasingly at alternatives" (p. 12). Specifically, hedge funds held out the promise of positive performance regardless of market returns. However, if hedge funds can fulfill this promise, the trillion dollar question is: Why did the industry experience outflows rather than inflows during the turmoil of the latest financial crisis?

In this paper, we attempt to address this question through a critique of structures that have evolved in the hedge fund industry, particularly post-2000, and specifically, Funds of Funds. Our critique is facilitated by several stylized models describing alternative structures in the industry. The models are: (1) An inside-only hedge fund model; (2) A straddling hedge fund model; (3) A straddling "feeder" fund of funds (FOF) hedge fund model; (4) A stand-alone hedge fund model; and (5) An outside "feeder" FOF hedge fund model. Our discussion of these models, which centers on advantages versus fundamental problems, leads to several hypotheses about the organizational structure, operational structure, risk, and return performance of both individual hedge funds and FOFs. We test as many of these hypotheses as data availability allows, and evidence is generally consistent with these hypotheses. We discuss FOFs from two distinct perspectives. First, an investor's perspective includes whether FOFs offer attractive features relative to regular hedge funds, or whether they outperform. In this respect, regarding characteristics, we predict that some hedge funds and FOFs will have greater leverage and/or more restrictive withdrawal policies than others. Regarding return performance, we predict that certain hedge funds, and FOFs in general, will have relatively poor return performance. Second, we analyze the role that FOFs play in the industry. Specifically, we ask whether FOFs "help" the funds in which they invest, or the industry in general, and we find that they do not. Finally, we discuss current trends in the industry that also appear to bear out our hypotheses. The paper is organized as follows. Section 2 provides a review of the literature related to hedge funds. In Section 3, we present and discuss several stylized structural models of the hedge fund industry, and specify several testable hypotheses. Section 4 describes the data that we use in our empirical analysis. In Section 5 we present and discuss results of empirical tests of our hypotheses. In Section 6 we discuss current trends in the hedge fund industry that relate to our hypotheses. Finally, Section 7 summarizes.

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2. LITERATURE REVIEW

In this section, we briefly review the extant literature related to hedge funds. Fung and Hsieh (1999) and Stulz (2007) provide excellent general descriptions of hedge funds' legal and organizational structures, so we do not repeat this discussion here, except to state that: (a) hedge funds are formed as private limited partnerships; (b) investment is restricted to high net-worth individuals or institutional investors; and (c) hedge fund managers typically receive compensation in the form of a fixed fee (e.g., 2% of AUM) and an asymmetric performance fee (e.g., 20% of fund returns above a hurdle rate (e.g., the risk-free rate)), while the typical compensation for the manager of a FOF includes a fixed fee of 1% and an asymmetric performance fee of 10%. Both types of managers are generally subject to a "high-water mark" restriction.

Instead, we review literature directly related to issues addressed in this paper, including illiquidity, opacity, conflicts of interest, leverage, and performance. As this review reveals, these issues are addressed in piecemeal fashion across articles in the extant literature. The objective of our modeling effort in Section 3 is to address, in an integrated fashion, not only these issues but others that have received little attention in the literature.

2.1. Information asymmetry (or opacity)

The information asymmetry or opacity problem may be the most serious problem that besets the hedge fund industry. Hedge funds lack transparency because each hedge fund's investment strategy is proprietary, so managers are loathe to reveal details about their strategy and operations to anyone, including current and prospective investors. They are private, rather than public, in order to avoid SEC requirements for filing audited financial statements (though some hedge funds do so). Hedge funds' reporting is essentially limited to a broad statement about investment strategy and periodic reports of fund returns. As a result, the entire hedge fund industry is potentially subject to the lemons problem associated with information asymmetry as in Akerlof (1970). Consequences of this problem have received considerable attention in the literature, though analyses focus more on implications of the problem and less on mechanisms to mitigate the problem.

Bollen and Pool (2009) use statistical analysis to determine whether hedge fund managers fully report gains but delay reporting losses in order to reduce the risk of capital flight. They suggest that their conditional serial correlation measure is a leading indicator of fraud. Bollen and Pool (2009) find ". . . a significant discontinuity in the pooled distribution of monthly hedge fund returns: the number of small gains far exceeds the number of small losses. The discontinuity is present in live and defunct funds, and

funds of all ages, suggesting it is not caused by database biases. The discontinuity is absent in the three months culminating in an audit, suggesting it is not attributable to skillful loss avoidance. The discontinuity disappears when using bimonthly returns, indicating a reversal in fund performance following small gains. This result suggests the discontinuity is caused at least in part by temporarily overstated returns" (Abstract). Brown, Goetzmann, Liang, and Schwarz (2008) examine SEC filings by hedge funds during a temporary period (February 2006) when SEC mandated filings (via Form ADV) were made (i.e., before a court overturned the mandate). Among other findings, they document: ". . . evidence that the information in the form has the potential to add value to the investor decision-making process. Hedge funds operated by managers filing Form ADV in 2006 had better past performance and had more assets than those operated by managers who did not file either because they were technically exempt from the filing requirement, or because they simply chose not to file. This result suggests that filing alone may be a potential signal of quality. In addition, we find a strong positive association between potential conflicts identified in the Form ADV filing and past legal and regulatory problems. Finally, through a canonical correlation analysis, we are able to establish a link between potential conflicts identified in Form ADV filings and operational risk characteristics in the Lipper TASS, Inc. (TASS) database" (p. 2787). Brown, Goetzmann, Liang, and Schwarz (2010) summarize the results of their analysis of hedge fund due diligence (DD) reports as follows: "In this paper we study a sample of 444 due diligence (DD) reports from a major hedge fund DD firm, many of which indicate a lack of transparency about past legal and regulatory problems, failure to use a major auditing firm and the use of internal pricing . . . This study uses evidence of inadequate or failed internal processes to derive a simple and direct measure of operational risk . . . Exposure to this risk increases the likelihood of subsequent poor performance. Since these DD reports are performed after positive performance it is important to control for potential bias due to this and other conditioning factors. Although our sample is not sufficiently large to determine whether this is a priced source of risk, it does not appear that exposure to operational risk influences in any way the tendency of hedge fund investors to invest on the basis of past high returns. Our study emphasizes the importance of information verification in the context of financial intermediation" (Abstract).

Finally, Stulz (2007) suggests that the relative growth of FOFs over time may be due to their role in mitigating opacity problems, among other roles: "A fund-of-funds is a hedge fund that invests in individual hedge funds and monitors these investments, thereby providing investors a diversified portfolio of hedge funds, risk management services, and a way to share the due diligence costs with other investors" (p. 180). So again, FOFs seem to hold promise as a positive development in the industry. In Section 3, we suggest an alternative motive for the development of some FOFs, particularly

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those developed by investment banks for their own funds. We also suggest a dark side to other FOFs: They may steer investors toward hedge funds that are relative lemons. We find support for this hypothesis.

2.2. Illiquidity

A hedge fund is created to exploit the talents of its managers to identify arbitrage opportunities that arise in a given security market due to temporary mispricing. Finance theory suggests that such opportunities are more likely to emerge, and to be larger, in securities that are relatively illiquid (e.g., small-firm stocks). As a general consequence, though, a considerable amount of time is required for these arbitrage strategies to yield profits. Thus, investment in a hedge fund itself is necessarily relatively illiquid. Getmansky, Lo, and Makarov (2004) and others document that hedge fund returns exhibit considerable 'exposure' to illiquidity.

To deal with illiquidity exposure, hedge funds generally impose two types of exit restrictions on its investors. First, a new investor is subject to an initial lock-up period during which the investor cannot withdraw their investment. Second, a seasoned investor must give redemption notice before they can withdraw their funds, and the filing of such a notice is often available only during certain time windows throughout the year. Exit restrictions vary considerably across hedge funds. Aragon (2007) documents evidence that average returns are higher for hedge funds that are more withdrawal restricted, suggesting that hedge fund returns in effect contain an 'illiquidity' premium. Similarly, Sadka (2010) finds 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” (p. 54). Also, Khandani and Lo (2009) find that the hedge fund returns are correlated with returns on illiquid assets (See also Longstaff (2001); Kahl, Liu, and Longstaff (2003); Lerner and Schoar (2004)). Of course, the flip side of this discussion is that hedge funds improve the liquidity of the markets in which they invest. Brophy, Ouimet, and Sialm (2009) document evidence consistent with this argument (See also Ben-David, Franzoni, and Moussawi (2010)).

Finally, it is conceivable that funds of hedge funds (FOFs) could serve to ease the illiquidity problem in the hedge fund industry. Specifically, a FOF could (a) spread investor redemptions across the numerous hedge funds in which it invests, or (b) identify specific hedge funds within its portfolio that are more amenable to redemptions at a given point in time. Indeed, such a redemptions distributing service could be a major reason for the existence of FOFs. Instead, researchers have focused on other reasons

for the existence of FOFs, as we discuss below. Thus, we test the redemptions distributing hypothesis by comparing the redemption-restriction terms of FOFs with those of stand-alone hedge funds. If the argument has merit, FOFs should be observed offering better redemption terms than stand-alone hedge funds. However, our modeling discussion in Section 3 leads us to be skeptical about the realization of this redemptions distributing service, at least for some FOFs. Indeed, we shall document that in the recent period, the FOFs do not offer better share redemptions than individual hedge funds.

2.3. Leverage

An under-investigated research question is why many hedge funds employ substantial leverage. The importance of the leverage question is underscored by the spectacular failures of hedge funds Long-Term Capital Management (LTCM) and Amaranth, both of which were highly levered. In a recent paper, Titman (2010) addresses the issue of hedge fund leverage:

> " . . . the leverage of investment funds, such as hedge funds, is not well understood. Many of the issues that relate to the leverage of hedge funds and the leverage of corporations are similar. In particular, in the event of a negative shock, the overly levered hedge fund, like an overly levered corporation, may be forced to close out illiquid positions at unfavorable costs. These costs received substantial attention in the popular press, both around the LTCM crisis in 1998 and during the more recent episode in 2008. However, the advantages of leverage for hedge funds are much less understood. Indeed, there are no tax advantages. Although issues of hedge fund leverage have attracted considerable attention from regulators and the popular press, academics have not seriously examined why hedge funds tend to be so highly levered. Despite the obvious disadvantages of leverage, hedge funds are often substantially more levered than typical corporations. Indeed, according to the Lipper TASS data base there are a number of convertible arbitrage funds that have leverage ratios that exceed five to one. And while the measurement of hedge fund leverage is itself a challenge, given the alternative avenues available to hedge funds for levering their investments, e.g., debt and derivatives, there seems to be substantial cross-sectional and time series variation in the use of leverage by hedge funds. The question that I will raise in this note is whether there is a fundamental (i.e., fully rational) explanation of the substantial use of leverage by hedge funds. Or do hedge funds simply use leverage to inflate returns in good times to fool or in other ways exploit nave clients?" (pp. 2-3).

Although Titman arrives at no definitive conclusions on the issue, he suggests several potential market imperfections that may explain hedge funds' use of leverage. For instance, hedge funds may use leverage on a contingent 'line-of-credit' basis to inject capital that offsets redemptions following poor

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performance. Alternatively, leverage "can arise from the convexity of the direct compensation of hedge funds as well as the indirect incentives that come from the hedge funds' inflows and outflows. Convex payoffs generate an incentive to increase leverage and in other ways increase risk" (p. 7). We discuss hedge funds' use of leverage within our modeling analysis in Section 3. We arrive at a hypothesis that is actually close to Titman's early quip that hedge funds may use leverage to "inflate returns in good times to fool or in other ways exploit nave clients", although our hypothesis predicts that only a subset of lemon hedge funds use leverage for this purpose. Due to unavailability on dynamic data on leverage we were unable to test these hypotheses.

2.4. Performance

The price performance of hedge funds is easily the most widely researched issue. Overall, the evidence regarding whether hedge funds provide superior return performance is mixed. In attempting to assess performance, researchers have had to deal with two major problems, (a) developing an appropriate benchmark for judging performance; and (b) dealing with survivorship bias in the data (See Fung and Hsieh (1997); Lo (2005)).

Ackermann, McEnally, and Ravenscraft (1999) conducted one of the earliest empirical analyses of hedge fund performance. They summarize their results as follows: "Using a large sample of hedge fund data from 1988-1995, we find that hedge funds consistently outperform mutual funds, but not standard market indices. Hedge funds, however, are more volatile than both mutual funds and market indices. Incentive fees explain some of the higher performance, but not the increased total risk. The impact of six data-conditioning biases is explored. We find evidence that positive and negative survival-related biases offset each other" (p. 833). In contrast, Grecu, Malkiel, and Saha (2007) find that managers of poorly performing funds more likely to fail to report results. Liang (2000) also questions the findings of Ackermann, McEnally, and Ravenscraft (1999) after finding survivorship bias of over 2% per year (See also Amin and Kat (2003)). Liang (2001) corrects for survivorship bias and finds that HFs have a higher Sharpe ratio than the S& P 500, 0.41 to 0.27, based on data for the years 1990-1999. Both Xiong, Idzorek, Chen, and Ibbotson (2009) and Fung, Hsieh, Naik, and Ramadorai (2008) find that hedge funds generate positive abnormal returns. Edwards and Caglayan (2010) also find evidence of hedge fund outperformance, as well as performance persistence for up to two years (See also Agarwal and Naik (2000); Kosowski, Naik, and Teo (2007)).

In contrast, several studies document evidence that hedge funds are unable to generate superior returns. Asness, Krail, and Liew (2001) find that, after accounting for stale pricing in illiquid securities, hedge funds do not provide superior returns. Fung and Hsieh (2004) find that global hedge fund

managers are unable to provide superior performance after adjusting for illiquidity effects, nonlinearity, and survivorship bias. Malkiel and Saha's (2005) analysis suggests that much of the reported superior performance of hedge funds is due to survivorship bias which, they estimate, adds up to 4.5% per year to hedge fund returns.

Finally, several researchers have analyzed the performance of FOFs. Ang, Rhodes-Kropf, and Zhao (2008) argue that because they offer diversification that investors cannot achieve on their own, FOFs are uniquely desirable investments. Agarwal and Kale (2007) argue that FOFs and multi-strategy hedge funds are similarly diversified, yet the multi-strategy hedge funds outperform FOFs even on a gross-of-fees basis. Fung, Hsieh, Naik, and Ramadorai (2008) find that FOFs deliver abnormal returns only for a brief period, and that mostly they underperform.

3. FUNDAMENTAL PROBLEMS WITH HEDGE FUNDS AND CRITIQUES OF ALTERNATIVE ORGANIZATIONAL STRUCTURES

To investors, the advantage of the hedge fund structure over mutual funds is that hedge funds have greater flexibility in seeking abnormal returns, or alpha. A hedge fund can take positions in the market that mutual funds cannot, including short positions, levered positions, and positions in derivatives. Moreover, hedge fund managers' contracts provide them with a strong incentive to create alpha, while mutual funds' contracts are more restrictive.

Against these and other advantages, however, there are many fundamental problems with hedge funds. In this section, we initially discuss these fundamental problems. We then describe several alternative organizational structures in the hedge fund industry to determine the extent to which each is subject to these fundamental problems.

3.1. A review of fundamental problems associated with hedge funds

Here we briefly discuss several fundamental problems associated with at least some hedge funds. Though all of these problems may be interrelated, some problems are more obviously related to each other, so we group the problems into three clusters.

3.1.1. Problem cluster 1: opacity

As discussed in Section 2, the opacity of hedge funds gives rise to two fundamental problems: (a) the lemons problem; and (b) the potential for fraud. Regarding the lemons problem, if investors lack the information necessary to distinguish hedge funds with genuine ability to generate alpha, then the

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industry will tend to include bogus or "lemon" hedge funds whose managers claim that their strategy produces alpha when in fact they do not. Such managers are simply attempting to reap private benefits from assets under management (AUM) for as long as possible. To extend their operations over time, they will resort to biased reporting of returns by using internal pricing, realizing gains while delaying losses, etc.

The literature reviewed in Section 2 alludes to two mechanisms to mitigate these opacity problems. First, investors will make transparency demands, such as an external audit. However, a hedge fund then may resort to hiring a lax auditor, to bribing the auditor, etc. Alternatively, a monitoring mechanism could be employed. For instance, Stulz (2007) suggests that FOFs could serve as monitors of stand-alone hedge funds. However, this argument presumes that the manager of the FOFs is not a benefitting participant in, or indeed the chief perpetrator of, a fraud.

3.1.2. Problem cluster 2: operational risks

Hedge funds face numerous risks that are inherent to their operations. First and foremost, hedge funds generally face liquidity risk, as they take positions in relatively illiquid securities, or positions in liquid securities that must be maintained for a considerable length of time. In turn, liquidity risk leads to funding risks. A hedge fund is financed by equity investors who may add to or withdraw their investments over time. Hedge funds respond to the liquidity risk posed by its equity investors by restricting investment and withdrawals, both initially and over time (i.e., in terms of lock-up period, redemption notice period, and redemption frequency). As we discuss later, the restrictions that a given hedge fund must impose depends critically on its investor clientele. A hedge fund's prime broker, as its lender, can also expose the fund to funding risk, because the prime broker may later withdraw or modify their lines of credit, margin terms or short-sale terms. In turn, funding risk engenders adjacency risk. Because investors' assets are co-mingled in a hedge fund, the decisions of some investors, particularly to either add or withdraw funds, may adversely affect the overall performance of the fund, especially if these actions disrupt the fund's trading strategy, causing either overinvestment or costly premature liquidations.

Of course, hedge funds' use of leverage poses its own risks, especially the potential need for costly distressed liquidations. Leverage can be used on a contingent "line-of-credit" basis to inject capital that offsets redemptions by equity investors following poor performance. On the other hand, as Titman (2010) argues, hedge fund managers may have an incentive, due to the convexity of their contracts, to use leverage even if it is not in the investors' interest.

Finally, we have concentration risk. If a hedge fund invests in only a few investments, or in only a few asset classes, sectors, or geographical areas, the fund will be more risky than if it was more diversified. FOFs and multi-strategy funds can alleviate this problem, the former by investing in stand-alone hedge funds that collectively are diversified, the latter by directly pursuing diversified strategies.

3.1.3. Problem cluster 3: alpha dilution risks

There are at least three ways in which a given hedge fund, pursuing a given strategy to generate alpha, can see their efforts thwarted. First, we have the issue of size. If the size of a hedge fund's AUM becomes large relative to the size of the market in which it is operating, its own trades can move prices and destroy alpha at the margin. Alternatively, if multiple hedge funds are, even unwittingly, pursuing the same source of alpha, as their collective AUM grows the same result will occur. Second, and related, is the risk of mimicking. New mimicking hedge funds may develop based on the success of a given hedge fund's strategy, especially if the initial hedge fund loses key personnel who then become competition for the same alpha. Third, because a hedge fund must use one or more prime brokers to execute trades, the executing broker may engage in *front running* of the hedge fund's trades, which can substantially dilute the hedge fund's ability to generate alpha.

3.2. Critiques of alternative hedge fund organizational structures

Next, we describe and critique several alternative organizational structures in the hedge fund industry in light of the fundamental problems discussed above. We facilitate our discussion by developing several stylized models of the organizational structures that have evolved in the industry in recent years (We admit that these models are simplifications of the hedge fund world, and are limited in scope to essential elements upon which we focus). The alternative structures vary in terms of the extent to which a given hedge fund is (a) tethered to a given investment bank and its "inside" investor clients, at one extreme, versus (b) funded by "outside" investors and/or a fund of funds, at the other extreme. Our discussion of these models highlights advantages and disadvantages of the alternative structures. In particular, we argue that opacity and conflict of interest problems vary substantially across these alternative structures, to the extent that some structures may be fundamentally flawed. Our critique leads to several hypotheses about cross-sectional variation in stand-alone hedge fund characteristics (redemption restrictions, leverage, the use of 1 vs. multiple prime brokers, etc.) and performance, as well as a hypothesis about the boom-and-bust cycle that the industry exhibited during the decade of the 2000s.

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3.2.1. The traditional investment bank model

The alternative hedge fund organizational structures that we will discuss are illustrated in Figures 2 to 6. However, we initially discuss a model of the traditional investment bank, illustrated in Figure 1. The traditional model is important for perspective, as "inside" hedge funds, defined later, directly supplant the traditional model. In the traditional model, the investment bank (the "House") employs investment managers who make trades for the individual accounts of "inside" or "client" investors, as well as proprietary trades for the House account. The investment bank executes these trades in its role as the sole prime broker, receiving commissions directly from individual clients. Individual client investors also pay the House full fees (as distinguished from the reduced fees they pay in a hedge fund structure). Finally, the investment bank pays salaries and bonuses to investment managers.

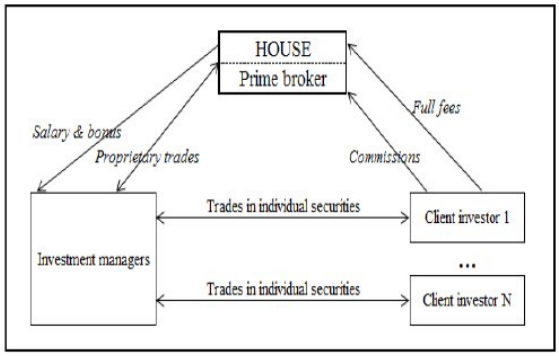

FIGURE 1 - TRADITIONAL INVESTMENT BANK MODEL

From the perspective of our analysis, the primary advantage of the traditional structure is the relatively stable bond that exists among (a) the House/prime broker, (b) the investment managers (i.e., trading talent), and (c) the individual investor clientele. In particular, the House serves as an effective monitor of investment managers on behalf of its clients because (a) it has inside information on the investment managers' trading strategies and performance, and (b) it has an incentive to protect its reputational capital. The primary disadvantages of the traditional structure include: (a) Individual investment managers are constrained in their trading strategies; (b) Investment managers' incentives are curbed if bonuses are based on pooled performance; and (c) The House incurs substantial back office costs associated with the numerous individual trades with individual clients. These disadvantages, among others, may have spurred the development of "inside" hedge funds, to which we now turn.

3.2.2. The inside-only hedge fund model

Our initial hedge fund model is illustrated in Figure 2. We label the depicted structure as "inside-only" because the focal hedge fund is open only to a given investment bank and its investor clientele. The

inside-only hedge fund has the simplest hedge fund structure among those we discuss, and it is also the oldest (i.e., in the modern hedge fund era). Comparing the inside-only hedge fund model with the traditional investment bank model, we see that: (a) the general managers of the hedge fund(s) replace the cadre of investment managers; (b) clients, as well as the House, invest in the hedge fund(s) rather than in individual securities; and (c) the House, via its role as prime broker, collects commissions from the hedge fund rather than from individual clients. Moreover, the hedge fund's general partners are paid directly from the hedge fund for their investment management services, so client investors pay only reduced fees to the House (rather than full fees in the traditional model, which include a component to pay salary and bonuses to investment managers). Finally, the House provides the hedge fund with a credit facility and risk management services.

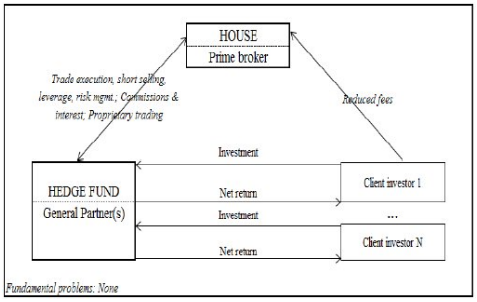

FIGURE 2 – INSIDE-ONLY HEDGE FUND MODEL

The advantages of the inside-only hedge fund structure are primarily that they mitigate disadvantages of the traditional structure noted earlier. First, the investment constraints faced by investment managers in the traditional structure are alleviated; the hedge fund's general partners are relatively free to pursue specific investment strategies that may involve specific securities, short-selling, the use of leverage, etc. Second, the hedge fund's general partners have a stronger incentive to perform than is the case for traditional investment managers because their pay is directly tied to the performance of the hedge fund that they control. Third, the House's back office costs are substantially reduced because individual clients invest in the hedge fund rather than numerous individual securities. The inside-only hedge fund structure should be able to capture these advantages without substantial loss of the "trust" advantage of the traditional structure. After all, the House can (a) control the amount of client (and House) capital that is invested in each of its inside hedge funds, and (b) effectively monitor the trading strategies and performance of its inside hedge funds. Moreover, the House has two strong incentives to monitor the performance of its inside hedge funds: (a) It still collects (albeit reduced) fees from its investor clientele; and (b) It stands to benefit from its own (i.e., proprietary) investment in the hedge funds. The inside hedge fund model also avoids all of the fundamental problems discussed earlier. Overall, we conclude

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that the inside-only hedge fund structure dominates the traditional investment bank structure. As we will see below, the inside-only hedge fund structure also appears to dominate other hedge fund structures.

3.2.3. The straddling hedge fund model

The second hedge fund structure is illustrated in Figure 3. We call this the "straddling" hedge fund model because, while the hedge fund remains strongly tethered to a single investment bank (especially its prime brokerage and investor clientele), it is also open to outside investors. A potential advantage of this structure over the "inside-only" structure is that each hedge fund has the opportunity to be larger, and thus better able to capture economies of scale, than if its size is restricted to include only the "inside" capital (i.e., clientele and House capital) allocated by the House. The hedge fund's general partners would be particularly keen to pursue this opportunity because both their base fee and profit share increase with fund size.

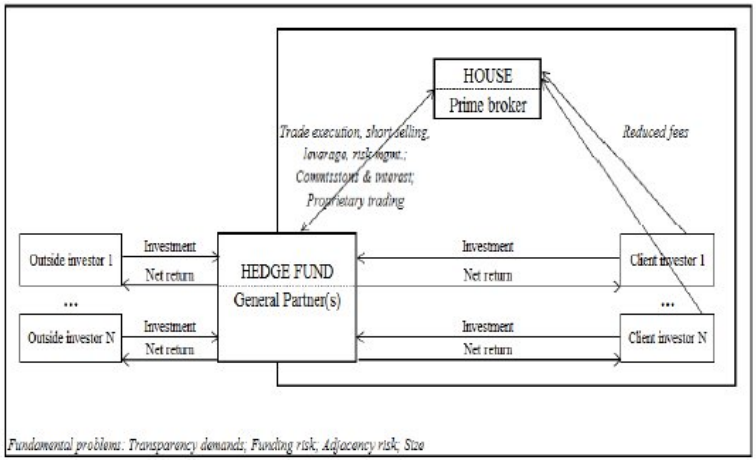

FIGURE 3 – STRADDLING HEDGE FUND MODEL

However, several fundamental problems attend the straddling hedge fund structure do not exist within inside-only hedge fund structure. These include transparency demands, funding risk, adjacency risk, and size. Regarding size, we stated above that increasing the size of a hedge fund can be an advantage due to economies of scale and increased incentive compensation for investment managers. However, if the fund grows too large for the market being exploited, alpha will be diluted. Of course, hedge fund can close to new investors to avoid this threat to its strategic mandate. Nevertheless, the adjacency problem emerges with new outside investors because, unlike the investment bank's inside investor clientele, outside investors have no bond of trust with the investment bank or its hedge funds. Thus, if outside investors withdraw substantial funds, other investors, including and especially the investment bank's inside investor clientele, stand to lose, which would compromise the bond of trust

with the investment bank. A straddling hedge fund can reduce the expected costs of un-orderly liquidations by having a longer lock-up period and more restrictive redemption terms, but these would also be imposed on inside clients, which was unnecessary in the "inside-only" hedge fund structure. Allowing outside investors into a hedge fund also engenders a transparency demands problem. Outside investors will demand information about the fund's investment strategy. Indeed, many institutional investors are barred from making investments where due diligence is inadequate. This may pose a dilemma because a hedge fund's investment strategy is proprietary, and its revelation in any detail would jeopardize its value. This problem may not be severe in the case of a straddling hedge fund because it can lean on its tether to the House's reputation; hence the term "brand hedge fund" in industry lexicon. However, as we discuss later the transparency dilemma may be a serious problem for "outside" hedge funds.

3.2.4. The straddling "feeder" fund of funds model

One means by which an investment bank can manage both investments into and withdrawals from its "opened" hedge funds by outside investors is to create a straddling "feeder" fund of funds as depicted in Figure 4. Outside investors invest in and withdraw from the FOF, and the FOF's general partners, working in conjunction with the House, allocate new outside capital to hedge funds that can profitably invest it, and allocate withdrawals to hedge funds that are most amenable to withdrawals. This investment-and-withdrawal allocation motive for developing a FOF complements the motives suggested by Stulz (2007) and noted earlier: monitoring, diversification, risk management, and due diligence efficacy.

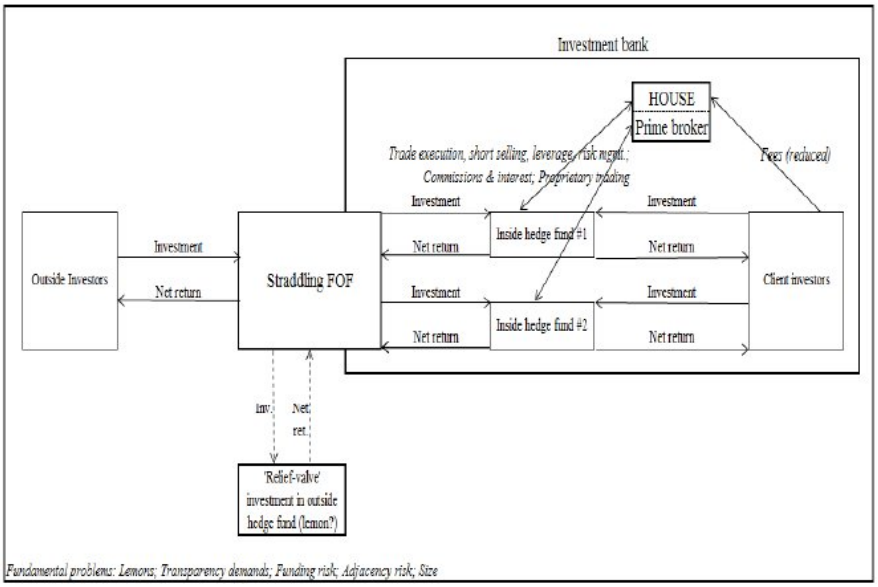

FIGURE 4 – STRADDLING "FEEDER" FUND OF FUNDS MODEL

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The investment bank can make further use of its FOF to reduce adjacency risk for its client investors by allocating some of the outside capital to additional "outside" hedge funds. These additional "relief valve" hedge funds can be employed to mitigate adverse effects of either excess capital inflows or withdrawals by outsiders on the inside hedge funds in which clients are directly invested. Of course, the outside hedge funds may be inferior to inside hedge funds, in which case the performance of the FOF will be inferior to the performance of the investment bank's inside hedge funds, even before the FOFs general partners take their cut. Thus, our straddling "feeder" FOF model suggests one reason why evidence (Agarwal and Kale (2007); Fung, Hsieh, Naik, and Ramadorai (2008)) has shown that FOFs underperform stand-alone hedge funds even on a gross-of-fees basis: "Relief-valve" hedge funds may be lemons.

3.2.5. The stand-alone outside hedge fund model

Figure 5 depicts a model for a simple stand-alone outside hedge fund. The outside hedge fund exhibits all of the fundamental problems that we have discussed. An outside hedge fund is likely to exhibit a greater lemons problem than the inside hedge funds discussed earlier because they are not formally tethered to an investment bank and its reputational capital. Thus, potential investors will make more transparency demands. Funding and adjacency risks are also likely to be high for an outside hedge fund. Size issues and mimicking may be a greater problem for outside hedge funds, as well.

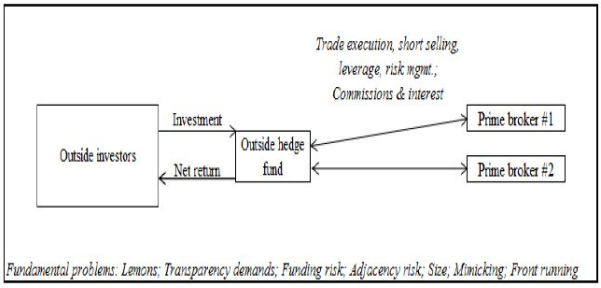

FIGURE 5 – OUTSIDE HEDGE FUND MODEL

Finally, outside hedge funds are exposed to greater front running risk. In the figure, we depict the outside hedge fund as having two prime brokers, as this may be necessary to limit front running.

3.2.6. The outside "feeder" fund of funds model

The final hedge fund organizational structure that we discuss, which we call the outside "feeder" fund of funds model, is depicted in Figure 6. Investors invest in the FOF, which in turn invests in a variety of "tethered" outside hedge funds. This arrangement has two potential advantages over the stand-alone outside hedge fund model. First, the outside FOF managers can efficiently screen "winner" outside

hedge funds, and monitor those selected, on behalf of investors. Second, the arrangement may serve to stabilize the flow of funds into and out of each hedge fund, thus alleviating both funding and adjacency risks for each of the outside hedge funds relative to what they would face on a stand-alone basis. This structure provides additional advantages in terms of reducing concentration risk and capturing economies of scale in terms of due diligence, risk management, and back office duties.

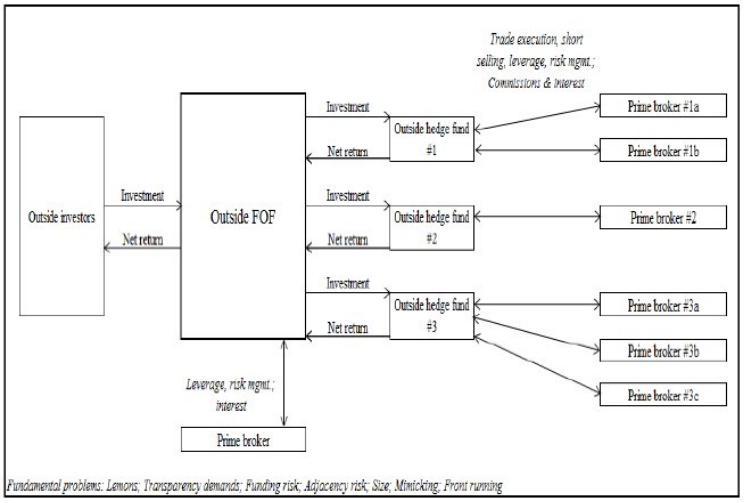

FIGURE 6 – OUTSIDE "FEEDER" FUND OF FUNDS MODEL

However, the outside "feeder" FOF structure is also replete with problems. First, adjacency risk may be substantial despite the moderating effect of a FOF because the investor base does not include a cadre of stable "inside" investors. For this reason, we predict that an outside FOF may actually be forced to offer relatively poor liquidity for outside investors (i.e., in terms of lock-up period, redemption notice period, and redemption frequency). Second, the general managers of both the outside FOF and the outside hedge funds in which it invests may have relatively small amount of reputational capital at stake, which can lead to a situation in which many of the outside hedge funds in the structure may be lemons. Third and finally, the bond between each hedge fund and the prime broker(s) it uses is much weaker than for "inside" hedge funds. Consequently, the stand-alone hedge funds in this structure may still need to employ multiple prime brokers to mitigate front running risk.

4. CONCLUSIONS

In this paper we investigate the role of funds of funds for investors as well as for the hedge fund industry. We find that fund of funds do not generate excess performance on top of that investors can achieve, and do not offer better liquidity terms than the average hedge fund. On the other hand, we find

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that hedge funds facilitate flows into funds and access to capital in general without however improving the funds' performance. This suggests that fund of funds would be more appropriate in their role as advisors to investors, than in their role of information facilitators or portfolio managers.

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