

A LAW AND FINANCE ANALYSIS OF HEDGE FUNDS*

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Abstract

This paper empirically analyzes the impact of hedge fund regulation on fund structure and performance using a cross-country dataset of 2137 hedge funds from 24 countries. The data indicate regulatory requirements in the form of restrictions on the location of key service providers and restrictions that enable distributions via wrappers tend to be associated with lower manipulation-proof performance measures, lower fund alphas, lower average monthly returns (as well as lower Sharpe ratios), higher fixed fees and lower performance fees. Also, the data show standard deviations of monthly returns are lower among jurisdictions with restrictions on the location of key service providers and higher minimum capitalization requirements.

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“Hedge funds are not, should not be, and will not be unregulated!!”

- *Christopher Cox (Chairman of SEC) in testimony before the Senate Banking Committee*
- *Wall Street Journal 23 June 2006*

In the United States (“the US”), hedge funds have been essentially an unregulated investment vehicle that has accumulated over a trillion dollars in assets as at 2005. With a trillion dollars of capital under management and at 5% alphas sought/promised by most hedge funds, this implies that there needs to be at least an aggregate above market return of \$50 billion. Given the implausibility of \$50 billion being readily available for hedge fund investors and managers who aim to “beat the market”, it seems highly likely that many hedge fund participants will be disappointed in the future. Further, the increasingly large pool of hedge fund capital under management has the potential to move other markets and impact financial stability. As a result, the tremendous growth of the hedge fund asset class and potential systemic risk has attracted regulatory attention from the US Securities and Exchange Commission (“the SEC”).¹

Hedge fund registration in the US commenced only in 2006 (Brav *et al.*, 2008; Partnoy and Thomas, 2007). In other countries around the world, hedge funds face stricter regulations such as minimum capital requirements, marketing restrictions, and restrictions on retail investor participation, among other things. The growth of hedge funds worldwide has led regulators to reevaluate the suitability and effectiveness of their regulatory oversight (see, e.g., PWC, 2006). How has hedge fund regulation impacted hedge fund structure and performance?

The purpose of this study is to facilitate an understanding of the impact of hedge fund regulation on fund governance and performance. I measure fund performance along a variety of different metrics, including Jensen’s alpha, a manipulation-proof performance measure (hereafter “MPPM”) (Goetzmann *et*

¹ <http://www.sec.gov/news/speech/spch111704hjg.htm>. For industry perspectives on hedge fund regulation, see, e.g., <http://www.hedgeco.net/hedge-fund-regulations.htm> and <http://www.hedgefundregulation.com/>

al., 2007) (as an alternative to the Sharpe ratio, which can be manipulated), and average monthly returns. With regard to fund structure, I focus on management and performance fees since hedge funds are best defined as a compensation scheme for a pool of money to be collectively managed and invested on behalf of the capital providers (Hodder and Jackwerth, 2007).²

In theory, there is an ambiguous relation between hedge fund regulation and hedge fund structure and performance. On one hand, a lack of regulatory oversight may give rise to fund managers that disguise investment schemes and merely capture the fees. This view is consistent with theory and evidence in Bebchuk and Fried (2003), at least in other contexts, that the compensation structure is part of the agency problem rather than its solution. For instance, suppose there are 2 funds managed by the same group of fund managers: one has a strategy of shorting the Standard and Poor's 500 Index ("S&P") while the other has a strategy of going long on the S&P.³ The additional aspects of the hedge fund marketed to the hedge funds' investors hide the true nature of these hedge funds. In the end, half of the investors of these two hedge funds will lose, while the hedge fund managers reap the profits of the fixed management fees and carried interest performance fees of both hedge funds. The fund investors remain unaware of the scheme due to all of the 'mumbo jumbo' of the marketing and promotional material of the hedge funds. Further, without regulatory oversight and/or hedge fund registration requirements, regulatory authors would also be unaware. Hedge fund registration and oversight would curb against this type of behaviour and thereby improve hedge fund structure and average performance.

On the other hand, regulatory oversight may hamper fund performance where hedge fund managers and their investors lose freedom to contract and organize their resources in the way that they

² Hedge funds may further be categorized by their strategic focus, and in this paper I control for a variety of different strategies.

³ This example was provided in a discussion at the DeGroot Microstructure Conference by Professor Larry Harris in November 2006, but does not necessarily reflect his views of the hedge fund industry.

deem to be most efficient, and thereby exacerbate agency problems.⁴ The most common forms of regulation in different countries around the world include restrictions on minimum hedge fund size, restrictions on the location of key service providers such as the administrator, custodian, investment advisor, auditors, legal and tax advisors, accountants, and consultants (as discussed in section 1 below), and limitations on the main market channels for hedge fund distribution. Such restrictions may constrain the fund to an inefficient scale, give rise to inefficient choice of human resources associated with fund management, create barriers to entry and limit investor participation most suited to the particular hedge fund's strategy. If so, I would expect worse hedge fund performance and less efficient hedge fund structures (that do not as efficiently align interests of investors and managers) in terms of higher management fees and lower performance fees.

These opposing views suggest the interaction between hedge fund regulation and hedge fund structure and performance is theoretically ambiguous and subject to whatever effect one believes dominates in the marketplace. The purpose of this paper therefore is to sort these issues out with an empirical analysis of pertinent data. In particular, I empirically examine the relation between hedge fund performance (including Goetzmann *et al.* (2007) MPPMs, Fung and Hsieh (2004) multifactor alphas, average monthly returns and the standard deviation of returns), hedge fund structure (fixed management fees and carried interest performance fees) and various aspects of hedge fund regulation (minimum capitalization, restrictions on the location of key service providers and restrictions on marketing channels) with an international dataset of 2137 hedge funds from 24 countries around the world (listed in section 1).

At a broad level, the data indicate regulatory requirements in the form of restrictions on the location of key service providers and marketing channels that permit wrappers tend to be associated with lower MPPMs, lower alphas, lower average returns, higher fixed fees and lower performance fees. The

⁴ Regulation has been shown to exacerbate agency problems in a variety of other contexts. For recent work, see e.g., Qi and Wald (2008), and Mansi *et al.* (2007).

standard deviation of returns is lower among jurisdictions with restrictions on the location of key service providers and higher minimum capitalization requirements.

In particular, in jurisdictions with restrictions on the location of key service providers, MPPMs are approximately 6-8 units lower (which is at least 50% of one standard deviation of MPPM, where the MPPM is the average monthly welfare of a power utility investor in the portfolio over the 2003-2005 period), and average monthly returns are approximately 0.6-0.9% lower. These effects are statistically significant and robust to alternative specifications, including alternative control variables, sample definitions with different datasets and exclusion of US funds, as well as Heckman sample selection corrected models for offshore registrations. There is further evidence that multifactor alphas and monthly standard deviation of returns are lower in jurisdictions that restrict the location of key service providers, but that evidence is less robust to the particular specification. Also, note that while the standard deviations of returns are lower in jurisdictions with restrictions on location, this reduction is not enough to compensate for the decline in returns thereby giving rise to a reduction in Sharpe Ratios.

There is fairly robust evidence that minimum capitalization restrictions lower the standard deviation of returns. The data indicate that an increase in required minimum capitalization for a hedge fund from \$1 to \$2 million tends to be associated with a reduction in standard deviation of monthly returns by 1%. Minimum capitalization restrictions, however, are statistically unrelated to other aspects of fund performance.

The evidence indicates that jurisdictions with marketing via wrappers have lower MPPMs by approximately at least 3.8 units (and this effect is statistically significant in all but one specification) and lower average monthly returns by at least 0.35% (and this effect is statistically significant in all specifications).

Finally, there is evidence that jurisdictions with restrictions on the location of key service providers and distributions via wrappers have lower performance fees by 4% and 3%, respectively. There is further evidence in some specifications that jurisdictions with wrapper distributions have higher fixed fees by 0.26% - 0.47%. Insofar as lower fixed fees and higher performance fees mitigate agency problems and better align interests of fund managers and owners, this evidence is consistent with the related evidence showing a negative relation between performance and jurisdictions with restrictions on location and distribution via wrappers and restrictions on location. I do note, however, that the evidence relating performance fees to restrictions on location and wrapper distributions is at times sensitive to the econometric specification and sample of funds considered.

The analyses build on a large and growing literature on hedge fund structure and performance (e.g., Ackermann *et al.*, 1999; Agarwal and Naik, 2000a,b, 2004; Agarwal *et al.*, 2006; Amin and Kat, 2003; Baquero *et al.*, 2005; Brown *et al.*, 1999, 2001; Brown and Goetzmann, 2003; Brunnermeier and Nagel, 2004; Cremers *et al.*, 2005; Edwards and Caglayan, 2001; Getmansky, 2005; Getmansky *et al.*, 2004; Liang, 1999, 2000, 2003; Gupta and Liang, 2005, Teo, 2007), as well as hedge fund activism (Brav *et al.*, 2008; Klein and Zur, 2006). The analyses are also related to analyses of hedge fund share restrictions (e.g., Aragon, 2007) and hedge fund registration (Brown *et al.*, 2006). Prior evidence, however, has not considered a cross-country law and finance analysis of hedge fund regulation in relation to fund structure and performance in the spirit of La Porta *et al.* (1998, 2002, and 2006). The analysis in this regard builds on evidence relating governance to hedge fund and mutual fund performance (Cremers *et al.*, 2005; Chevalier and Ellison, 1997; Elton *et al.*, 2003), and the structure of hedge funds and strategies (Ding *et al.*, 2006; Fung and Hsieh, 1997, 2000, 2001; Goetzmann *et al.*, 2003; Jorion, 2000).

This paper is organized as follows. Section 1 briefly describes hedge fund regulation in the countries considered. Section 2 introduces the data. Multivariate analyses are presented in section 3. Section 4 discusses limitations and future research. Policy implications and concluding remarks follow in

section 5. Additional robustness checks concerning selection effects for fund location are reported in the Appendix.

1. Hedge Fund Regulation, Structure and Performance

1.1. Hedge Fund Regulation

In the US, hedge funds are formed as limited partnerships whereby the investors are considered limited partners and the hedge fund managers are general partners. The limited partners are wealthy individuals and institutional investors. Compensation for hedge fund managers comprises a 1-2% fixed management fee based on hedge fund asset size and a 15-20% carried interest performance fee based on the profits. Incentive fees align interests of hedge fund managers as general partners and the investors as limited liability partners who only retain their limited liability by not taking part in any aspect of the management of the fund. Hedge funds are not allowed to advertise in the US. There is no restriction on the minimum size to operate as a hedge fund, and no restrictions on the location of key service providers. Hedge funds in the US can avoid the public disclosure requirements of the US Securities Act of 1933 by claiming the status of a private placement.⁵ Hedge funds are also exempt from the US Investment Company Act of 1940 (which regulates mutual funds) by having no more than 499 investors⁶ with more than \$5 million in assets, and by not making public offerings. Prior to February 2006, hedge funds in the US were also exempt from any registration requirement. Brown *et al.* (2006) analyze the impact of this registration requirement and find favorable quality signals are possible with registration. Verret (2007)

⁵ In a private placement there must not be more than 35 “non-accredited” investors, whereby a non-accredited investor is someone with more than \$1 million in wealth or earned more than \$200,000 in the previous two years.

⁶ This restriction was previously set at 99 investors. For a further discussion, see, e.g., http://faculty.fuqua.duke.edu/~charvey/Teaching/BA453_2001/SAM/SAM.htm

gives specific commentary on the hedge fund regulatory and presents a model of self-regulation as a major theme of the policy recommendation.

In other countries around the world, unlike the US, there are minimum capital requirements for hedge fund managers to operate a hedge fund, as well as different avenues for marketing (not merely private placements), and restrictions on the location of key service providers (see Figure 1) typically to be within the same jurisdiction. These regulations are summarized in Table 1 for 24 different countries (see also PWC, 2006, for an extended discussion for most of these countries⁷). The focus is on the regulations in place in the period 2003 to 2005, which are stable for the regulations and countries enumerated in Table 1.

[Figure 1 and Table 1 About Here]

A typical hedge fund does not have any employees but instead delegates different functions to service providers of the hedge fund (Figure 1). Outsourcing a hedge fund's functions minimizes risks of collusion among hedge fund participants to perpetuate fraud, and also mitigates liability in the event the hedge fund participants are accused of improperly performing their management duties. A hedge fund's board of directors or trustee has a fiduciary duty to the investors to ensure that all parties involved in the fund can properly carry out their designated tasks. At issue in this paper is whether the form of regulatory oversight in the countries enumerated in Table 1 provides an additional level of governance and an additional check that fraud is not perpetuated. If regulatory oversight facilitates additional value-added governance then I would expect hedge funds in those jurisdictions to have higher alphas, Sharpe ratios

⁷ The majority of countries and years are available in PWC. For countries/years not available in PWC, we obtained information about regulation from the hedge funds in a survey sent to selected funds. It is noteworthy that the broad regulatory categories we use have been stable over time (distribution channels, size and restrictions on location are rarely modified restrictions), but there have been changes to other areas, particularly taxation.

and average returns. In the alternative, one may infer that restrictions on minimum capital requirements for managers, restrictions on the location of key service providers, and limitations on the main market channels for hedge fund distribution constrain the fund to an inefficient scale, give rise to inefficient choice of human resources associated with hedge fund management, create barriers to entry and limit investor participation most suited to the particular hedge fund's strategy.⁸ In that case, one would expect worse hedge fund performance and less efficient hedge fund structures (that do not as efficiently align interests of investors and managers) in terms of higher management fees and lower performance fees. These competing predictions are the focus of the empirical analyses in the remainder of this paper.

1.2. Hedge Fund Location

Hedge fund location depends on economic conditions and proximity to the fund's investors, taxation and regulatory burdens. The country of domicile of the fund managers may influence fund location particularly in reference to countries with restrictions on the location of key service providers. As well, fund managers that expect better performance may locate in jurisdictions with fewer regulatory burdens and lower taxes. For instance, offshore locations such as the Bahamas, Bermuda, and the Cayman Islands have few regulatory burdens and minimal tax for funds and their investors. The absence of regulatory oversight in such countries would render it difficult for fund managers without a track record to raise capital from institutional investors, while more established fund managers with a track record are less likely to experience such problems in fundraising.

⁸ An alternative interpretation is as follows. It is possible that jurisdictions with more stringent hedge fund regulation also have more active regulators that monitor hedge fund manager activities. Klein and Zur (2006) find that activist hedge fund managers achieve their target returns by extracting cash from the investee firms from which they acquire at least a 5% stake through forcing increased investee debt capacity and higher dividends. If regulatory oversight curtails this type of activist investment, one may infer that it will also lower expected returns.

In the empirical analyses below, I consider econometric models that account for non-random selection of location. In particular, I provide estimates of location choice with the use of two-step Heckman corrections (as well as a other specifications that exclude select countries). I find that the results are quite robust to alternative statistical treatment of location choice.

1.3. Hedge Fund Performance Measures

This paper uses Goetzmann *et al.*'s (2007) Manipulation-Proof Performance Measure (MPPM), Fung and Hsieh's (2004) multifactor alpha, average monthly hedge fund returns and standard deviation of average monthly returns over the January 2003 to December 2005 period to measure hedge fund performance. The results are also robust to earlier time periods, albeit the earlier time periods comprise smaller samples since many funds in the data were formed only recently formed. I consider a variety of performance measures to show robustness because there is little consensus regarding appropriate performance measurement for hedge funds among academics and practitioners (Baghi-Wadji and Klocker, 2007). The results pertaining to regulation are nevertheless quite robust to specifications reported and otherwise; alternative specifications are available upon request.

The MPPM is analogous to the Sharpe ratio, originally called the "reward-to-variability" ratio, and has traditionally been one of the most popular measures for risk-adjusted performance. However, it is now widely known that Sharpe Ratio and other reward-to-risk measures may be manipulated with option-like strategies (Goetzmann *et al.*, 2007), and this type of manipulation may reasonably be expected to be commonplace among hedge funds. Therefore, I use the recently proposed MPPM by Goetzmann *et al.*

(2007) for the hedge fund industry to remove bias from potential manipulation of the Sharpe Ratio.⁹ The MPPM proposed by Goetzmann *et al.* is defined as follows:

$$\hat{\Theta} \equiv \frac{1}{(1-\rho)\Delta t} \ln\left(\frac{1}{T} \sum_{t=1}^T [(1+r_{ft})^{-1}(1+r_{ft}+x_t)]^{1-\rho}\right)$$

where r_{ft} and x_t is the per-period (not annualized) risk free rate and the excess return of the fund over period t . The parameter ρ is the relative risk aversion; historically this number ranges from 2 to 4 for the CRSP value-weighted market portfolio depending on the time and frequency of data used. The $\hat{\Theta}$ can be interpreted as the annualized continuously-compounded excess return of the portfolio. (Goetzmann *et al.*, 2007). The MPPM is interpreted as the average per period welfare of a power utility investor in the portfolio over the time period in question. I found the regression results to be very robust to MPPMs for three different risk aversions: 2, 3 and 4. I report MPPM values for risk aversion 3, and results for alternative risk aversion parameters are available upon request.

A second performance measure considered in this paper is known as ‘alpha’. Jensen’s (1968) alpha is a single factor model based on the classical CAPM developed by Sharpe (1964) and Lintner (1965). Following the single factor models, a variety of multi-factor models have been developed and applied in the research of hedge funds (Fung and Hsieh, 1997, 2004; Liang, 2002; Getmansky, Lo, and Makarov, 2004; Lo, 2006). The multi-factor models could be expressed in a general form as following:

$$r_t^i = \alpha^i + \sum_{k=1}^K \beta_k^i F_{k,t} + \varepsilon_{i,t}$$

where r_t^i is the excess return (in excess of the risk-free rate) on hedge fund i for month t , α^i is the abnormal performance of hedge fund i over the regression time period, β_k^i is the factor loading of hedge fund i on factor k during the regression period, $F_{k,t}$ is the return for factor k for month t , and $\varepsilon_{i,t}$ is the

⁹ In an earlier draft of this paper I reported similar regression analyses with the Sharpe Ratio and found similar results. Those results are available upon request.

error term. The main difference among those models is the selection of factors. Fung and Hsieh (2004) have developed a seven factor model, which has been shown strong explanatory power in variation of hedge fund performance. Based on their model, I run the regression as following:

$$r_t^i = \hat{\alpha}^i + \sum_{k=1}^K \hat{\beta}_k^i F_{k,i} + \hat{\varepsilon}_{i,t}$$

The factors are S&P 500 return minus risk-free rate (SNPMRF), Wilshire small cap minus large cap return (SCMLC), change in the constant maturity yield of the 10-year Treasury (BD10RET), change in the spread of Moody's Baa minus the 10-year Treasury (BAAMTSY), bond PTFS (PTFSBD), currency PTFS (PTFSFX), and commodities PTFS (PTFSCOM), where PTFS denotes primitive trend following strategy. The estimated intercept $\hat{\alpha}^i$ is the alpha performance measure or the abnormal performance of hedge fund i over the regression time period.

A challenge with the multifactor models is they might be sensitive to alternative specifications and benchmarks (Agarwal *et al.*, 2000a). I take the 3-month LIBOR converted into monthly rate as the risk-free rate. Alternative benchmarks were also considered and did not materially affect the results; these are available upon request. As well, note that the results in a prior version of this paper made use of the single factor Jensen's alpha, and showed a slightly stronger but consistent relation between the regulation variables and the alphas as reported herein. Also, it is noteworthy that hedge funds have a variety of different strategies (the data, described in the next section, considers more than 20 strategies). I explicitly report results with strategy variables that are used to explain cross-sectional differences in hedge fund performance. Alternative approaches that account for strategy when estimating alphas and other performance metrics (such as grouping hedge funds into homogenous categories) did not materially influence the inferences drawn pertaining to legality and hedge fund regulation.¹⁰

¹⁰ The only cases where results were affected were for subsamples of funds using strategies where there was a dearth of funds that fit within the strategy class.

1.4. Other Factors Pertinent to Hedge Fund Structure and Performance

In the empirical analyses in the subsequent sections, I control for a variety of characteristics other than hedge fund regulation that may impact hedge fund performance. First, quality of investor protection and enforcement differs across countries of different legal origin, and hence I consider the law and finance legal origin variables in the different countries (as in La Porta *et al.*, 1998, 2002, 2006). I also control for international differences in GNP per capita in the countries considered.

Second, I control for a variety of hedge fund characteristics, including the frequency with which investors may withdrawal capital, hedge fund size, hedge fund age, minimum investment amounts per investor, and performance and management fees. These control variables are used in ways consistent with prior work measuring hedge fund performance (e.g., Ackermann *et al.*, 1999; Agarwal and Naik, 2000a,b, 2004; Agarwal *et al.*, 2006; Baquero *et al.*, 2005; Brown *et al.*, 1999, 2001; Brown and Goetzmann, 2003; Brunnermeier and Nagel, 2004; Cremers *et al.*, 2005; Edwards and Caglayan, 2001; Getmansky, 2005; Getmansky *et al.*, 2004; Liang, 1999, 2000, 2003). As well, in the dataset considered (described immediately below), there are details regarding the primary fund strategy (24 different categories), as well as regional variables for the location of assets (for the US, as well as by continent). In the multivariate empirical analyses I show robustness of the hedge fund regulation results to the inclusion/exclusion of all of these variables.

2. Data

2.1. Data Source

This paper makes use of two datasets: (1) Center for International Securities and Derivatives Markets (CISDM), and (2) HedgeFund.Net (“HFN”) DataExport collected by Channel Capital Group Inc.

The CISDM data comprise a total of 2462 funds. Of these, 1127 have performance statistics for 2003-2005. The HFN data comprises a total of 5298 funds. Of these, 1350 have performance statistics for 2003-2005 and complete information on fund domicile and other variables of interest. Among these funds found an overlap of 340 funds in the HFN data and the CISDM data. In total, therefore, I use 1127 funds from CISDM and 1010 funds from HFN. The total sample comprises 2137 hedge funds from the 24 countries enumerated in Table 1. Summary statistics for the funds are provided in Table 2.

[Table 2 About Here]

Fung and Hsieh (2006) have shown that only 3% of hedge funds appear in 5 of the major hedge fund databases (CISDM, TASS, EUR, MSCI and HFR). The CISDM sample has 44.6% of funds domiciled in the US (and the combined CISDM/HFN sample has 68.1% of funds domiciled in the US), while the TASS sample reported in International Financial Services (2006) has 34% of funds domiciled in the US. The CISDM sample has 50.4% of funds domiciled in offshore jurisdictions (and the CISDM/HFN sample has 27.3%), while the TASS sample has 55%. The CISDM sample has 3.1% of funds from the European Union (and CISDM/HFN sample has 3.3%), while the TASS sample has 9%. While I cannot say whether the CISDM or combined CISDM/HFN samples are representative of the worldwide population of hedge funds, I nevertheless do report the results with and without the HFN data, as well as with and without the US fund, to show robustness to different samples. As well, I report sample selection models for funds that selected offshore domiciles. I explicitly show the results are very robust to these different subsamples and econometric methods.

2.2. *Potential Biases*¹¹

¹¹ Biases in all hedge fund databases are described in a variety of sources, such as http://faculty.fuqua.duke.edu/~charvey/Teaching/BA453_2001/SAM/SAM.htm

Hedge fund databases may exhibit biased performance results through selection bias, survivorship bias and instant history bias. Selection bias is present where databases do not comprise the universe of hedge funds. HedgeFund.net uniquely provides comparable international data across a large number of different countries. As with other prior research using single-country datasets, I cannot rule out selection bias. I nevertheless consider robustness of the results to excluding different countries, such as the US, from the regression analyses. Survivorship bias and instant history bias may also be present in the data; however, the analyses focus on a relatively short window of time, namely 2003 to 2005, in which there were no extreme market events for which I would expect systemic bias in the data. I have also considered the robustness of the results to different periods with longer histories, and the results are quite robust (available upon request). Further, I have considered different populations of funds depending on their start date and have found similar results (again, available upon request).

2.3. Summary Statistics and Univariate Correlations

Table 2 defines and summarizes the performance measures in the data for the January 2003-December 2005 period, as well as the regulatory variables and variables for hedge fund characteristics. The average hedge fund's alpha was 4.56% [median 2.15] and the average MPPM was 9.07 [median 7.42]. The average monthly percentage return was 0.99 [median 0.80]. The average age for the hedge funds with performance data in January 2003 to December 2005 was 86.69 months [median 74 months], and the average hedge fund size was \$129.061 million [median \$28.249 million] in 2005 US dollars. The average fixed fee for the hedge funds was 1.37% [median 1.00%], and the average performance fee was 18.09% [median 20.00%]. Additional hedge fund statistics as well as minimum and maximum values are indicated in Table 2.

Table 3 provides univariate correlations across all of the variables enumerated in Table 2. Hedge funds with higher performance fees have significantly higher MPPMs (correlation is 0.10) and average

monthly returns (correlation is 0.11). Table 3 also indicates high correlations across many of the variables, and hence I assess the robustness of the results to alternative specifications in the multivariate analyses.

[Table 3 About Here]

3. Multivariate Analyses

The multivariate empirical tests proceed in 5 sets of regressions which analyze MPPMs (Table 4), alphas (Table 5), average monthly returns (Table 6), standard deviation of average monthly returns (Table 7), and fixed fees and performance fees (Table 8).

The central focus of the following discussion is on the impact of regulation on hedge fund performance and structure. Robustness to inclusion/exclusion of control variables for legal origin, GNP per capita, and various hedge fund characteristics is also considered. Five specifications are presented for each of Tables 4-7 on performance to show robustness (20 models in total). I report results for the full sample (Models 1, 2, 6, 7, 11, 12, 16, 17), the subsample excluding US funds (Models 3, 8, 13, 17), the subsample excluding the HFN data (Models 4, 9, 14, 19), and a Heckman sample selection model for offshore registrants (Models 5, 10, 15 and 20). I report three specifications are provided for each of management and performance fees in Table 8 where I use the full sample (Models 21 and 22), the subsample excluding the US funds (Models 23 and 24) and the subsample excluding the HFN data (Models 25 and 26). Alternative sets of explanatory variables did not materially impact the results, and additional specifications not presented are available upon request.

The Heckman (1976, 1979) sample selection models are specified in the following way. I do not use the traditional approach, but use a modified selection effect approach that is consistent with that in

other hedge fund work (most notably, see Baquero et al., 2005). The first step is a logit regression on a dummy variable equal to one for offshore registrants with explanatory variables that include legal origin and more than a dozen explanatory variables for the location of the fund's assets and the fund's primary strategy. I had considered taxation variables, but tax benefits for different jurisdictions depend on fund strategies and characteristics and are not easily quantified into a few variables; as such, I focus on the fund strategy and asset location dummy variables. The second step of the Heckman regression is analogous to the companion single step OLS models provided in each of the tables analyzing performance.

At a broad level, the data indicate that regulatory requirements in the form of restrictions on the location of key service providers and marketing channels permitting wrappers tend to be associated with lower MPPMs, lower fund alphas, lower average returns, higher fixed fees and lower performance fees. The standard deviation of returns is lower among jurisdictions with restrictions on the location of key service providers and higher minimum capitalization requirements. Specific details are summarized below.

[Tables 4 – 8 About Here]

3.1. Restrictions on Key Service Providers

The data indicate that jurisdictions with restrictions on the location of key service providers (see Figure 1 and accompanying text) have worse performance results. Table 4 indicates MPPMs are at least 5.81 lower (Model 1), and up to 8.34 lower (Model 5) depending on the econometric specification, among

jurisdictions with restrictions on location of key service providers.¹² This effect is statistically significant at at least the 5% level in all of the specifications (and at the 1% level of significance in Models 1 and 2). The effect is economically large in that it is at least 50% of one standard deviation of the MPPM for the most conservative estimate in Model 1. The implication of the data is that a location restriction inefficiently constrains the human capital availed to a hedge fund thereby leading to worse performance. There is no apparent corporate governance benefit to a geographic proximity between a hedge fund's service providers and the hedge fund's regulatory body.

The evidence for the other performance indicators in Tables 5 and 6 provides similar results. Multifactor alphas in Table 5 are 10% (Model 9) – 16.8% (Model 10) lower for restrictions on the location of key service providers. This effect, however, is not statistically significant in Models 6-8 in Table 5. Table 6 similarly indicates that for jurisdictions which restrict the location of key service providers, average monthly returns are significantly lower by at least 0.546% in Model 11 (and up to 0.863% lower in Model 13), and the statistical significance is robust in each specification in Table 6. Note as well that the restriction on the location of key service providers lowers the standard deviation of monthly returns in Table 7, but that reduction is not sufficient to compensate for the reduction in returns and as such the Sharpe ratio is lower.¹³ This is consistent with the findings when using other risk-adjusted performance measures such as the MPPM.

¹² In related specifications (not explicitly presented in this paper), I also found Sharpe ratios are approximately 0.10-0.12 lower for funds in jurisdictions with restrictions on the location of key service providers.

¹³ The change in the Sharpe ratio is

$$\Delta \text{SharpeRatio} = \frac{(R - R_f) + \Delta R}{\sigma + \Delta \sigma} - \frac{R - R_f}{\sigma} = \frac{\Delta R \sigma - (R - R_f) \Delta \sigma}{(\sigma + \Delta \sigma) \sigma}$$

Regardless of the Models selected in Tables 6 and 7, the change is negative for restrictions on the location of key service providers.

There is no statistically significant relation between fixed management fees and restrictions on the location of key service providers. But it is noteworthy that jurisdictions with restriction on the location of key service providers have carried interest performance fees that are 4.2% lower in the subsample excluding US data (Model 24) (although this effect is not significant in Models 22 and 26). The data therefore indicate some complementary evidence (at least for the sample of non-US funds) that restrictions on the location of key service providers give rise to an inefficient wedge in the alignment of interests between hedge fund investors and hedge fund managers in terms of aligning interests with performance incentive contracts.

3.2. Minimum Capitalization Requirements

The data indicate some evidence that restrictions on minimum capitalization in a jurisdiction are associated with differences in hedge fund performance. Table 7 shows that an increase in required minimum capitalization for a hedge fund from \$1 to \$2 million is associated with a reduction in standard deviation of monthly returns by 1%. The statistical significance of this result is robust in the full sample (Models 16 and 17), and the subsamples excluding US funds (Model 18) and the HFN data (Model 19), but not robust in the specification with Heckman sample selection corrections for offshore registrants (Model 20b).

The minimum capitalization restrictions are generally insignificant in the other tables apart from Table 7.¹⁴ One limitation with regards to minimum capitalization (as indicated in Table 2) is that proxies are needed for some countries, since the requirements are not exact. Note as well that minimum capitalization requirements appear binding on only a small proportion of the sample (that is, some funds in countries without minimum capitalization are smaller than the minimum capitalization levels in other

¹⁴ The one exception is the positive effect in Model 9, but this effect is not robust to the other specifications in Table 5.

countries); nevertheless, it is possible that some funds face problems associated with first achieving the minimum capitalization hurdle when they first start the fund.

3.3. Hedge Fund Distribution Restrictions

The data indicate that jurisdictions with marketing restrictions via wrappers show lower MPPMs by 3.808 (Model 1) – 21.389 (Model 5). This effect is statistically significant in Models 4 and 5 at the 5% level, and at the 1% level in Models 1 and 2, but statistically insignificant in Model 3. Hedge funds have a Sponsor that has the responsibility for marketing the Sponsor Fund. In the case of wrappers, the sponsor distributes the offering materials for the Sponsor Fund as well as the disclosure materials for the affiliated wrapper products. There is a potential conflict of interest between the Sponsor and the Fund Manager with respect to the disclosure of the wrapper relating to the Fund Manager (Gerstein, 2006). This conflict of interest is one possible explanation for the negative association between wrappers and fund performance.

Fund distributions via wrappers do show a statistically significant negative association with average monthly returns in all of the models in Table 6.¹⁵ The economic significance ranges from -0.349 in Model 11 to -1.503 in Model 15. Wrappers are also associated with lower standard deviations in Table 7 Models 17 and 18; however, the reduction in standard deviation is comparatively smaller than the reduction in average returns, thereby giving rise to a reduction in the Sharpe ratio (for example, based on Models 12 and 17, the Sharpe ratio is estimated to be 8.7% lower among jurisdictions that permit wrappers¹⁶).

¹⁵ By contrast, in Table 5 there is no statistically significant relation between multifactor alphas and wrapper distributions. Alternative specifications of the multifactor model were considered, and in some cases there was a negative association.

¹⁶ See note 12 for the formula to estimate the change in the Sharpe Ratio.

Finally, note that permitted wrapper distributions are associated with significantly higher fixed fees by 0.263% in Model 21 (for the full sample) and by 0.468% in Model 25 (for the subsample with CISDM data only). In other words, fund managers appear able to extract higher fixed fees when the fund is marketed in combination with other products.¹⁷ Also, wrapper distributions are associated with significantly lower performance fees in Model 24 (among the non US funds) by -2.51%. Non-US fund managers are afforded fewer performance incentives when the fund is distributed alongside other products. Table 8 further indicates evidence in Models 22 and 24 of higher performance fees associated with private placements.¹⁸ Note that the included variables for distribution channels were selected based on minimizing correlations with other variables, as indicated in Table 3; when other distribution variables are included the results tend to exhibit less statistical significance.

3.4. Control Variables

A number of the control variables are significant in ways consistent with prior research. Most notably, French and German legal origin countries are negatively associated with MPPMs (Table 4), alphas (Table 5) and average monthly returns (Table 6). These results are consistent with La Porta *et al.* (1998, 2002, 2006) (a dummy variable for English legal origin is suppressed to avoid perfect collinearity).

There is evidence that hedge fund characteristics impact performance and structure. Large hedge funds tend to have higher MPPMs (Models 1, 2 and 4) and higher alphas (Models 8-10) and lower standard deviation of monthly returns (Models 16-20). There are other significant variables in Tables 4-8,

¹⁷ For this reason, tied selling is prohibited in some contexts among financial institutions; see, e.g., http://www2.bmo.com/bmo/files/images/3/1/CoerciveTiedSelling_eng.pdf

¹⁸ An earlier version of this paper showed a positive relation between fund performance fees and private placements; however, that result was less robust in the prior paper.

albeit not as robust. Other variables were also considered but not reported since there were immaterial. For instance, in Table 8 I considered the MSCI returns in the year prior to the establishment of the hedge fund, but this effect was insignificant and did not materially impact the other included variables. These and any other specifications are available upon request.

4. Extensions and Future Research

This paper introduced for the first time a cross-country law and finance analysis of the impact of hedge fund regulation on hedge fund performance. The data were based on 24 countries and focused on performance measures over the January 2003 to December 2005 period. The data indicate hedge fund regulation in the form of restrictions on the location of key service providers and marketing via wrapper distribution was negatively related to hedge fund performance and hedge fund manager performance fees.

One potential concern with the analysis of the relation between hedge fund regulation and governance and performance relates to non-random location choice, as discussed above in subsection 1.2. I explicitly showed robustness of the results to selection effects with location choice.

A second potential concern is that tax differences for offshore versus onshore funds drive differences in performance. I explicitly showed results for the subsample of offshore funds accounting for selection effects, and the results were robust. In specifications not presented but available upon request, I show robustness to exclusion of offshore funds. Hence, the findings in this paper are not likely attributable to tax differences.

A third potential concern is in respect of robustness to alternative datasets. In this paper I have shown robustness to the CISDM dataset and the HedgeFund.Net dataset. I have also shown robustness to considering the subset of onshore versus offshore funds, and to exclusion of US funds. Most of the

results are quite robust, as explicitly shown herein. Other robustness checks were performed but not reported for reasons of conciseness. For instance, with a more parsimonious model and excluding funds' first two years performance (for a possible backfilling bias) with the combined dataset, the results are consistent with the results reported herein. These and other robustness checks are available upon request.

Generalizations from the data are constrained to the markets and market conditions from which the data are drawn. The analyses focused on performance over 2003-2005. It may be the case that hedge fund regulation plays a more favorable role on performance in times of market crashes, but the data examined consider a relatively stable time period. I did consider earlier time periods, which generally provided results which are similar to those reported herein. However, those results were based on a more restricted sample and fewer countries due to data limitations. Hedge fund regulation may also play a more favorable role in other countries. Further research on other time periods and other countries is warranted. Further research could also investigate the interaction between hedge fund regulation and hedge fund activism (for US evidence, see Brav et al., 2008, and Klein and Zur, 2006), and other similar forms of financial intermediation.

Finally, it is worth noting that I do not provide a normative evaluation on the desirability of regulations that give rise to lower performance measures for investors. A government objective function may weight more heavily reductions in the standard deviation of returns than anything to do with performance, for example. Further research could assess governmental or societal objectives to appropriately assess suitable hedge fund regulations for different countries. The analysis has been confined to assessing the impact of fund regulation on risk-adjusted performance for investors, and fund structure in terms of fixed and performance fees.

5. Concluding Remarks

This paper empirically analyzed the impact of hedge fund regulation on fund structure and performance using a cross-country dataset of 2137 hedge funds from 24 countries for the January 2003 to December 2005 period. The focus on the analysis involved regulatory requirements in the form of minimum capitalization imposed on hedge fund managers, restrictions on the location of key service providers and restrictions on marketing channels via private placements in relation to hedge fund alphas, a manipulation-proof performance measures (MPPMs), average monthly returns, fixed fees and performance fees.

Restrictions on the location of a hedge fund's key service providers tend to give rise to worse performance in terms of lower MPPMs, lower alphas, lower average monthly returns and lower performance fees. Overall, therefore, in the 2003-2005 period of regular economic conditions for the 24 countries considered, hedge fund regulation in terms of locational restrictions of key service providers has hampered fund performance and distorted efficient fund compensation structures. I also found that distribution via wrappers was associated with lower performance results, higher fixed fees and lower performance fees, which may reflect conflicts of interest associated with the marketing and distribution of companion products. Nevertheless, I did see some evidence that distributions via wrappers as well as minimum capital requirements tend to be associated with lower standard deviations of returns. Hence, while hedge fund regulation tends to inhibit performance and incentive fees, it also has the potential to lower risks in the market. The current evidence from hedge fund regulation therefore does offer guidance for the ongoing policy debates on hedge fund regulation. Further research is warranted as more data and natural experiments arise with the likely upcoming changes in the regulatory environment around the world.

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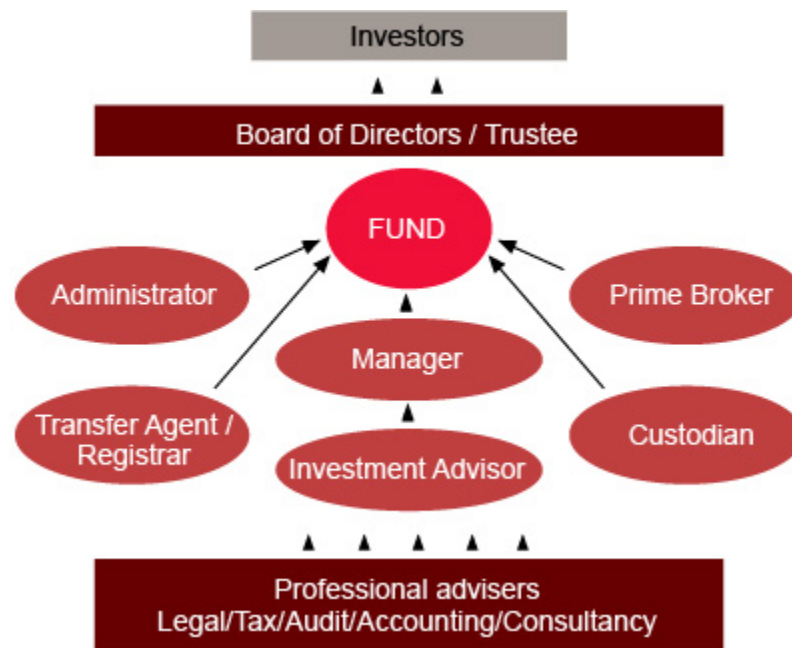


Figure 1. Typical Parties Appointed to Operate a Hedge Fund

Note:

Administrator: record and bookkeeping and independently verify asset value of the fund

Registrar / Transfer Agent: process subscriptions and redemptions and maintain registrar of shareholders

Custodian: safe-keeping of assets

Prime Broker: provides access to stock and loan financing, as well as a host of value-added services

Source:

PriceWaterhouseCoopers http://www.pwchk.com/home/eng/hedge_fund_operation_jul2005.html

Table 1. Regulation of and Channels for Distribution of Hedge Funds by Country

This table summarizes by country the regulation of hedge funds across 24 countries, including the minimum capital requirements, permissible marketing channels and whether there exists restrictions on the location of key service providers (Figure 1). The minimum capital requirements to operate as a hedge fund manager are vary in some countries depending on fund characteristics and as such are proxied, as summarized in this table, for the purpose of empirical analyses in the subsequent tables (and the results are robust to alternative proxies).

Country	# Funds in Combined CISDM HFN Dataset	# Funds in CISDM Dataset	Proxy for minimum capital requirement to operate as hedge fund manager (2005 US \$)	Main marketing channels								Restrictions on location of key service providers?	Legal Origin			GDP per Capita (2005 US \$)
				Banks	Fund distribution companies	Wrappers	Private placements	Investment managers	Other regulated financial services institutions	Non-regulated financial intermediaries	Total number of marketing channels		English	French	German	
Australia	2	1	0	1	1	1	1	1	1	0	6	0	1	0	0	\$30,700
Austria	2	1	\$6,750,000	1	1	1	0	0	0	0	3	0	0	0	1	\$31,300
Bahamas	19	18	\$25,000	0	0	0	1	1	0	0	2	1	1	0	0	\$17,700
Bermuda	76	70	\$0	1	0	0	1	1	0	0	3	1	1	0	0	\$36,000
Brazil	6	4	\$362,000	1	1	0	1	1	1	0	5	1	0	1	0	\$8,100
British Virgin Islands	97	97	\$500,000	1	0	0	1	1	0	0	3	1	1	0	0	\$24,500
Canada	20	13	\$0	1	1	1	1	1	1	0	6	0	1	0	0	\$31,500
Cayman Islands	372	371	\$500,000	1	0	0	1	0	0	0	2	1	1	0	0	\$32,300
Channel Islands	4	0	\$44,077	1	1	1	1	1	1	1	7	0	1	0	0	\$35,264
China	1	0	\$0	1	1	1	1	1	1	0	6	1	0	0	1	\$5,600
France	8	7	\$168,750	0	1	1	1	1	0	0	4	0	0	1	0	\$28,700
Hong Kong	1	0	\$2,275,000	1	1	0	1	1	1	0	5	0	1	0	0	\$34,200
Ireland	24	20	\$67,500	1	0	0	1	0	1	0	3	1	1	0	0	\$31,900
Isle of Man	1	1	\$142,500	0	1	1	1	1	0	0	4	1	1	0	0	\$35,000
Japan	2	0	\$0	1	1	1	1	1	1	0	6	0	0	0	1	\$29,400
Luxembourg	9	9	\$168,750	1	0	0	0	0	1	0	2	0	0	1	0	\$58,900
Mauritius	2	2	\$0	0	0	0	1	0	0	0	1	1	1	0	0	\$12,800
Netherlands	1	0	\$303,750	0	0	1	0	1	1	0	3	1	0	1	0	\$29,500
Netherland Antilles	6	6	\$0	0	0	0	1	0	0	0	1	1	0	1	0	\$11,400
New Zealand	1	1	\$0	1	1	1	1	1	1	0	6	0	1	0	0	\$23,200
Switzerland	2	0	\$4,300,000	1	1	1	0	1	1	0	5	1	0	0	1	\$33,800
UK	20	0	\$67,500	1	0	1	1	1	0	0	4	0	1	0	0	\$29,600
US	1455	503	\$0	0	0	0	1	0	0	0	1	0	1	0	0	\$40,100
US Virgin Islands	6	0	\$500,000	1	0	0	1	1	0	0	3	1	1	0	0	\$15,000

Table 2. Definition of Variables and Summary Statistics

This table defines the main variables used in the paper. Summary statistics are also provided for each variable. The performance data are for the period January 2003 - December 2005. The data comprise 2137 funds, of which 1127 are from CISDM and 1010 are from HFN Data. I have excluded some funds from the HFN Data sample where I discovered conflicting information about the fund's domicile. All regression analyses are reported for the full sample and the subsample of only the CISDM Data. The CISDM hedge fund data are available for free to subscribers of Wharton WRDS, and the HFN Data are available for a fee from HedgeFundData.net.

Variable	Definition	Mean	Median	Standard Deviation	Minimum	Maximum	No. of Observations
<u>Performance Variables</u>							
3-Year Alpha	Alpha of Multifactor Model (Fung and Hsieh, 2004), expressed in percentages	4.559	2.150	26.263	-100.000	507.307	2137
3-Year Manipulation Proof Performance Measure	Manipulation Proof Performance Measure (Goetzmann et al., 2007)	9.067	7.421	11.314	-29.993	79.671	2137
3-Year Average Return	3-Year Average Monthly Return, expressed in percentages	0.993	0.797	0.900	-6.795	10.301	2137
3-Year Standard Deviation of Returns	The 3-year standard deviation of returns	2.737	2.099	2.747	0.040	73.103	2137
<u>Hedge Fund Regulation Variables</u>							
Log Minimum Capitalization	The log of the minimum capitalization required to operate as a hedge fund manager in 2004 US dollars	3.435	0	5.698	0	15.725	2137
Restrictions on Location of Key Service Providers	A dummy variable equal to 1 where the country imposes restrictions on the location of key service providers (Figure 1)	0.287	0	0.452	0	1	2137
Marketing Bank	A dummy variable equal to 1 where the country allows fund distribution via banks (as defined in Table 1)	0.302	0	0.459	0	1	2137
Marketing Fund Distribution Company	A dummy variable equal to 1 where the country allows fund distribution via fund distribution companies	0.023	0	0.151	0	1	2137
Marketing Via Wrappers	A dummy variable equal to 1 where the country allows fund distribution via wrappers	0.030	0	0.170	0	1	2137
Marketing Private Placement	A dummy variable equal to 1 where the country allows fund distribution via private placements	0.994	1	0.075	0	1	2137
Marketing Investment Manager	A dummy variable equal to 1 where the country allows fund distribution via investment managers	0.299	0	0.458	0	1	2137
Marketing Other Regulated Financial Institution	A dummy variable equal to 1 where the country allows fund distribution via other regulated financial institutions	0.034	0	0.182	0	1	2137
<u>Country GNP and Legal Origin</u>							
Log GNP Per Capita	Log of the country's GNP per capita, expressed in 2004 US dollars	10.506	10.599	0.196	8.631	10.984	2137
French Legal Origin	A dummy variable equal to one for French legal origin countries (La Porta <i>et al.</i> , 1998)	0.014	0	0.118	0	1	2137
German Legal Origin	A dummy variable equal to one for German legal origin countries (La Porta <i>et al.</i> , 1998)	0.003	0	0.057	0	1	2137
<u>Fund Characteristics</u>							
Yearly Capital Redemptions	A dummy variable equal to 1 if capital redemptions are possible only on an annual basis	0.103	0	0.304	0	1	2137
Log Assets	The log of the fund's assets in millions of 2004 US dollars	17.134	17.157	1.726	11.028	23.668	2137
Log Age	The log of the fund's age in months from the date of formation to December 2005	4.334	4.304	0.496	2.996	6.146	2137
Minimum Investment	The minimum investment required for the fund	1181787	500000	11269825	0	500000000	2137
Management Fee	The fixed fee in percentages for management compensation	1.367	1	0.896	0	15	2137
Performance Fee	The carried interest performance fee in percentages for management compensation	18.094	20	5.770	0	50	2137

Table 3. Correlation Matrix

This table presents correlations across the variables defined in Table 2. Correlations significant at the 5% level are highlighted in underline font.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
(1)	3-Year Alpha	1.00																					
(2)	3-Year Manipulation Proof Performance Measure	<u>0.06</u>	1.00																				
(3)	3-Year Average Return	<u>0.11</u>	<u>0.83</u>	1.00																			
(4)	3-Year Standard Deviation of Returns	0.04	<u>0.19</u>	<u>0.37</u>	1.00																		
(5)	Log Minimum Capitalization	-0.01	<u>0.16</u>	<u>0.07</u>	-0.04	1.00																	
(6)	Restrictions on Location of Key Service Providers	-0.03	<u>0.18</u>	<u>0.08</u>	<u>-0.05</u>	<u>0.86</u>	1.00																
(7)	Marketing Bank	-0.02	<u>0.16</u>	<u>0.06</u>	-0.04	<u>0.86</u>	<u>0.90</u>	1.00															
(8)	Marketing Fund Distribution Company	-0.03	0.03	<u>0.06</u>	0.04	<u>0.07</u>	-0.03	<u>0.17</u>	1.00														
(9)	Marketing Via Wrappers	-0.01	-0.02	0.00	0.02	<u>0.11</u>	<u>-0.08</u>	<u>0.21</u>	<u>0.75</u>	1.00													
(10)	Marketing Private Placement	0.01	0.02	0.03	0.03	<u>-0.12</u>	0.01	<u>-0.10</u>	<u>-0.07</u>	<u>-0.10</u>	1.00												
(11)	Marketing Investment Manager	-0.02	<u>0.17</u>	<u>0.07</u>	<u>-0.05</u>	<u>0.85</u>	<u>0.90</u>	<u>0.93</u>	<u>0.22</u>	<u>0.26</u>	0.01	1.00											
(12)	Marketing Other Regulated Financial Institution	-0.02	0.04	<u>0.05</u>	0.03	<u>0.14</u>	<u>0.07</u>	<u>0.28</u>	<u>0.64</u>	<u>0.47</u>	<u>-0.40</u>	<u>0.10</u>	1.00										
(13)	Marketing Non-Regulated Financial Institution	0.03	<u>0.07</u>	<u>0.07</u>	0.04	<u>0.06</u>	-0.03	<u>0.07</u>	<u>0.28</u>	<u>0.25</u>	0.00	<u>0.07</u>	<u>0.23</u>	1.00									
(14)	Sum of Marketing Channels	-0.03	<u>0.15</u>	<u>0.08</u>	-0.02	<u>0.76</u>	<u>0.75</u>	<u>0.91</u>	<u>0.54</u>	<u>0.54</u>	<u>-0.06</u>	<u>0.90</u>	<u>0.47</u>	<u>0.21</u>	1.00								
(15)	Log GNP Per Capita	0.01	<u>-0.18</u>	<u>-0.14</u>	-0.03	<u>-0.64</u>	<u>-0.69</u>	<u>-0.58</u>	<u>-0.28</u>	<u>-0.18</u>	<u>-0.13</u>	<u>-0.67</u>	<u>-0.19</u>	-0.01	<u>-0.63</u>	1.00							
(16)	French Legal Origin	0.00	<u>0.05</u>	0.03	-0.01	<u>0.13</u>	0.04	<u>0.05</u>	<u>0.35</u>	<u>0.19</u>	<u>-0.52</u>	<u>0.05</u>	<u>0.33</u>	-0.01	<u>0.14</u>	<u>-0.28</u>	1.00						
(17)	German Legal Origin	-0.01	-0.03	0.02	0.03	<u>0.05</u>	0.02	<u>0.09</u>	<u>0.37</u>	<u>0.33</u>	<u>-0.21</u>	<u>0.05</u>	<u>0.21</u>	0.00	<u>0.18</u>	<u>-0.12</u>	-0.01	1.00					
(18)	Yearly Capital Redemptions	0.01	<u>0.08</u>	<u>0.06</u>	-0.02	<u>0.12</u>	-0.04	-0.02	<u>-0.14</u>	<u>-0.15</u>	<u>-0.16</u>	<u>-0.05</u>	<u>-0.06</u>	0.03	<u>-0.16</u>	<u>-0.06</u>	-0.01	<u>-0.16</u>	1.00				
(19)	Log Assets	-0.04	<u>0.17</u>	0.04	<u>-0.20</u>	<u>-0.19</u>	<u>0.08</u>	-0.01	<u>0.29</u>	<u>0.32</u>	<u>0.31</u>	0.00	-0.01	-0.04	<u>0.31</u>	0.01	0.03	<u>0.26</u>	<u>0.09</u>	1.00			
(20)	Log Age	-0.01	0.02	-0.01	<u>0.08</u>	-0.02	0.04	-0.04	<u>-0.06</u>	-0.04	<u>-0.07</u>	-0.02	<u>-0.05</u>	0.01	<u>-0.06</u>	-0.04	0.04	<u>-0.07</u>	<u>0.15</u>	<u>0.20</u>	1.00		
(21)	Minimum Investment	-0.02	-0.02	-0.02	-0.02	0.00	-0.01	0.00	0.02	0.02	0.02	-0.01	-0.01	0.00	0.02	-0.01	0.00	0.01	0.00	0.02	0.01	1.00	
(22)	Management Fee	0.02	-0.02	0.03	<u>0.08</u>	<u>-0.07</u>	-0.01	<u>0.05</u>	<u>0.08</u>	<u>0.07</u>	<u>0.08</u>	<u>0.06</u>	<u>0.06</u>	0.00	<u>0.08</u>	<u>0.05</u>	0.01	<u>0.09</u>	<u>-0.06</u>	0.03	-	-0.01	1.00
(23)	Performance Fee	0.01	<u>0.10</u>	<u>0.11</u>	<u>0.16</u>	<u>-0.14</u>	0.03	-0.03	<u>0.17</u>	<u>0.18</u>	<u>0.19</u>	0.02	0.03	0.03	<u>0.19</u>	0.03	0.00	<u>0.17</u>	<u>-0.11</u>	<u>0.05</u>	-	-0.01	1.00
																					<u>0.07</u>		

Table 4. Regression Analyses of Manipulation Proof Performance Measure

This table present OLS regression analyses of the determinants of the Manipulation Proof Performance Measure (Goetzmann *et al.*, 2007) for the cross-section of funds in the data. Explanatory variables are as defined in Table 2. Dummy variables are included for the continents in which assets are primarily located, and the funds' primary strategy (30 dummy variables in total). Models (1) and (2) present the full sample and different right-hand-side variable to check for collinearity problems. Models (3) and (4) show robustness exclusion of the US funds and the HFN Data, respectively. Models (5) shows a two-step regression whereby the first step is a logit regression on a dummy variable equal to one for offshore registrations, and the second step is a Heckman sample selection regression given the results in the first step. White's HCCME is used in all regressions.

Variable	Model (1): Full Sample		Model (2): Full Sample		Model (3) Excluding US Funds		Model (4): CISDM Data only, Excluding HFN Data		Model (5a): Heckman Sample Selection [1st Step]		Model (5b): Heckman Sample Selection [2nd Step]	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	119.529	5.310***	133.238	5.671***	106.879	3.878***	137.292	4.410***	-1.916	-6.052***	201.531	4.869***
<u>Hedge Fund Regulation Variables</u>												
Log Minimum Capitalization			-0.108	-1.341	-0.107	-1.325	-0.091	-1.132			-0.102	-0.919
Restrictions on Location of Key Service Providers	-5.811	-6.416***	-7.352	-3.623***	-8.128	-2.170**	-7.736	-2.365**			-8.338	-1.971**
Marketing Bank			2.466	1.392	4.890	1.875*	2.267	0.805			1.794	0.588
Marketing Fund Distribution Company			1.192	0.444	-0.779	-0.249	12.851	1.665*			23.553	2.905***
Marketing Via Wrappers	-3.808	-2.457**	-6.114	-2.520**	-4.228	-0.890	-15.228	-2.219**			-21.389	-2.686***
Marketing Private Placement	-2.015	-0.707	-2.322	-0.686	2.038	0.591	-4.050	-0.748			-10.561	-1.347
<u>Country GNP and Legal Origin</u>												
Log GNP Per Capita	-10.176	-5.281***	-11.383	-5.644***	-11.736	-5.034***	-12.886	-4.552***			-15.792	-4.349***
French Legal Origin	-4.212	-1.945*	-4.428	-1.839*	-2.236	-0.749	-8.126	-2.713***	1.252	2.741***	-16.066	-3.468***
German Legal Origin	-2.061	-0.699	-2.484	-0.676	-1.089	-0.279	-10.215	-3.650***	0.024	0.021	-19.041	-1.619
<u>Fund Characteristics</u>												
Yearly Capital Redemptions	2.650	4.173***	2.684	4.216***	1.658	0.804	3.528	3.139***			4.666	1.846*
Log Assets	0.294	2.234**	0.282	2.146**	0.300	1.296	0.462	2.317**			0.363	1.249
Log Age	0.095	0.229	0.080	0.195	0.673	0.818	0.175	0.271			-0.220	-0.201
Minimum Investment	-8.848E-10	-0.027	-6.537E-10	-0.009	-3.347E-09	-0.888	4.093E-09	0.667			-1.206E-08	-0.576
Management Fee	0.221	1.299	0.214	1.261	0.209	0.851	0.092	0.613			0.592	1.244
Performance Fee	-0.044	-1.018	-0.044	-1.013	-0.149	-1.124	-0.268	-3.043***			-0.421	-2.860***
HFN Data Dummy	-8.258	-9.859***	-8.271	-10.035***	-2.006	-0.563						
Heckman's Lambda											-7.284	-5.927***
Dummy Variables for Primary Location of Assets?	Yes		Yes		Yes		Yes		Yes		No	
Dummy Variables for Primary Fund Strategy?	Yes		Yes		Yes		Yes		Yes		No	
<u>Model Diagnostics</u>												
Number of Observations	2137		2137		682		1127		2137		553	
Adjusted R ² (Pseudo R ² for Model 4a Step 1)	0.374		0.374		0.352		0.288		0.321		0.154	
Loglikelihood	-7688.666		-7686.443		-2473.886		-4149.271		-829.836		-2078.916	
F-Statistic (Chi Square for Model 4a Step 1)	24.62***		23.41***		11.28***		13.65***		784.075***		7.29***	
Akaike Information Statistic	7.247		7.248		7.363		7.429				7.580	

Table 5. Regression Analyses of Multifactor Alpha

This table present OLS regression analyses of the determinants of the alpha of the multifactor model (Fung and Hsieh, 2004) for the cross-section of funds in the data. Explanatory variables are as defined in Table 2. Dummy variables are included for the continents in which assets are primarily located, and the funds' primary strategy (30 dummy variables in total). Models (6) and (7) present the full sample and different right-hand-side variable to check for collinearity problems. Models (8) and (9) show robustness exclusion of the US funds and the HFN Data, respectively. Models (10) shows a two-step regression whereby the first step is a logit regression on a dummy variable equal to one for offshore registrations, and the second step is a Heckman sample selection regression given the results in the first step. White's HCCME is used in all regressions.

Variable	Model (6): Full Sample		Model (7): Full Sample		Model (8) Excluding US Funds		Model (9): CISDM Data only, Excluding HFN Data		Model (10a): Heckman Sample Selection [1st Step]		Model (10b): Heckman Sample Selection [2nd Step]	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	-27.066	-0.514	-17.098	-0.319	-5.140	-0.092	36.731	0.618	-1.916	-6.052***	175.963	2.540**
<u>Hedge Fund Regulation Variables</u>												
Log Minimum Capitalization			0.156	0.902	0.151	0.872	0.437	2.819***			0.143	0.771
Restrictions on Location of Key Service Providers	-0.510	-0.270	-5.299	-1.283	-0.640	-0.078	-10.037	-1.899*			-16.757	-2.359**
Marketing Bank			3.043	0.883	3.423	0.753	2.228	0.487			8.358	1.636
Marketing Fund Distribution Company			-14.948	-2.047**	-14.303	-2.110**	-6.374	-0.526			-0.115	-0.009
Marketing Via Wrappers	1.568	0.385	6.444	1.036	11.951	1.204	-5.118	-0.473			-1.698	-0.128
Marketing Private Placement	4.973	0.587	14.472	1.450	6.123	0.549	11.922	1.158			-2.890	-0.221
<u>Country GNP and Legal Origin</u>												
Log GNP Per Capita	1.898	0.441	0.807	0.186	-3.900	-0.819	-5.141	-0.971			-18.027	-2.965***
French Legal Origin	2.868	0.542	10.083	1.681*	7.812	1.359	4.477	0.744	1.252	2.741***	-3.790	-0.498
German Legal Origin	-4.711	-0.245	5.607	0.270	1.180	0.049	-29.738	-4.780***	0.024	0.021	-47.775	-2.476**
<u>Fund Characteristics</u>												
Yearly Capital Redemptions	0.389	0.257	0.433	0.286	9.239	2.029**	2.334	1.047			4.908	1.156
Log Assets	-0.658	-1.103	-0.701	-1.165	1.792	3.763***	0.918	2.423**			1.620	3.328***
Log Age	-0.093	-0.076	0.020	0.016	-4.148	-2.347**	-1.821	-1.434			-4.255	-2.319**
Minimum Investment	-1.964E-08	-0.156	-2.098E-08	-0.112	-9.819E-09	-1.140	-6.532E-09	-0.551			-2.393E-08	-0.678
Management Fee	1.060	1.963**	1.071	1.969*	0.282	0.411	1.174	3.601***			1.661	2.083**
Performance Fee	0.087	0.726	0.071	0.578	0.023	0.089	0.119	0.686			0.168	0.681
HFN Data Dummy	-3.299	-1.082	-3.648	-1.179	-5.941	-1.068						
Heckman's Lambda											8.084	4.028***
Dummy Variables for Primary Location of Assets?	Yes		Yes		Yes		Yes		Yes		No	
Dummy Variables for Primary Fund Strategy?	Yes		Yes		Yes		Yes		Yes		No	
<u>Model Diagnostics</u>												
Number of Observations	2137		2137		682		1127		2137		553	
Adjusted R ² (Pseudo R ² for Model 8a Step 1)	0.037		0.039		0.107		0.107		0.321		0.066	
Loglikelihood	-9948.232		-9944.312		-2969.467		-4869.931		-829.836		-2364.826	
F-Statistic (Chi Square for Model 8a Step 1)	2.57***		2.53***		3.28***		4.74***		784.075***		3.44***	
Akaike Information Statistic	9.361		9.361		8.817		8.708				8.614	

Table 6. Regression Analyses of Average Monthly Returns

This table presents OLS regression analyses of the determinants of the average monthly returns for the cross-section of funds in the data. Explanatory variables are as defined in Table 2. Dummy variables are included for the continents in which assets are primarily located, and the funds' primary strategy (30 dummy variables in total). Models (11) and (12) present the full sample and different right-hand-side variable to check for collinearity problems. Models (13) and (14) show robustness exclusion of the US funds and the HFN Data, respectively. Models (15) shows a two-step regression whereby the first step is a logit regression on a dummy variable equal to one for offshore registrations, and the second step is a Heckman sample selection regression given the results in the first step. White's HCCME is used in all regressions.

Variable	Model (11): Full Sample		Model (12): Full Sample		Model (13) Excluding US Funds		Model (14): CISDM Data only, Excluding HFN Data		Model (15a): Heckman Sample Selection [1st Step]		Model (15b): Heckman Sample Selection [2nd Step]	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	11.752	6.009***	13.108	6.540***	10.739	4.922***	11.996	4.684***	-1.916	-6.052***	18.447	5.006***
<u>Hedge Fund Regulation Variables</u>												
Log Minimum Capitalization			-0.010	-1.551	-0.010	-1.452	-0.009	-1.411			-0.011	-1.071
Restrictions on Location of Key Service Providers	-0.546	-7.426***	-0.702	-4.156***	-0.863	-2.660***	-0.598	-2.235**			-0.696	-1.847*
Marketing Bank			0.243	1.638	0.391	1.793*	0.177	0.763			0.164	0.606
Marketing Fund Distribution Company			0.215	1.035	0.120	0.527	0.911	1.369			1.717	2.382**
Marketing Via Wrappers	-0.349	-2.977***	-0.634	-3.236***	-0.643	-1.726*	-1.109	-1.855*			-1.503	-2.124**
Marketing Private Placement	-0.031	-0.118	-0.095	-0.309	0.236	0.702	-0.391	-0.830			-0.982	-1.408
<u>Country GNP and Legal Origin</u>												
Log GNP Per Capita	-0.946	-5.768***	-1.062	-6.354***	-1.082	-5.899***	-1.072	-4.654***			-1.415	-4.376***
French Legal Origin	-0.316	-1.621	-0.377	-1.781*	-0.295	-1.188	-0.677	-2.591***	1.252	2.741***	-1.397	-3.400
German Legal Origin	0.471	1.338	0.378	0.904	0.493	0.975	-0.304	-1.244	0.024	0.021	-1.007	-0.965
<u>Fund Characteristics</u>												
Yearly Capital Redemptions	0.239	3.988***	0.242	4.042***	0.268	1.598	0.339	3.366***			0.416	1.848*
Log Assets	-0.011	-0.876	-0.012	-0.951	-0.011	-0.539	-0.011	-0.617			-0.006	-0.220
Log Age	-0.053	-1.429	-0.054	-1.467	0.054	0.802	0.081	1.454			0.016	0.166
Minimum Investment	6.005E-11	0.022	8.399E-11	0.013	-3.936E-10	-1.291	7.909E-11	0.171			-1.247E-09	-0.668
Management Fee	0.019	1.307	0.019	1.253	0.029	1.330	0.012	0.972			0.063	1.485
Performance Fee	0.002	0.523	0.002	0.551	-0.008	-0.867	-0.017	-2.511**			-0.034	-2.568**
HFN Data Dummy	-0.389	-5.271***	-0.387	-5.291***	0.060	0.261						
Heckman's Lambda											-0.614	-5.635***
Dummy Variables for Primary Location of Assets?	Yes		Yes		Yes		Yes		Yes		No	
Dummy Variables for Primary Fund Strategy?	Yes		Yes		Yes		Yes		Yes		No	
<u>Model Diagnostics</u>												
Number of Observations	2137		2137		682		1127		2137		553	
Adjusted R ² (Pseudo R ² for Model 12a Step 1)	0.245		0.246		0.312		0.274		0.321		0.134	
Loglikelihood	-2480.760		-2477.397		-810.639		-1404.041		-829.836		-798.092	
F-Statistic (Chi Square for Model 12a Step 1)	13.80***		13.21***		9.56***		12.80***		784.075***		6.35***	
Akaike Information Statistic	2.373		2.373		2.486		2.557				2.743	

Table 7. Regression Analyses of Average Monthly Standard Deviations

This table present OLS regression analyses of the determinants of the average monthly standard deviations for the cross-section of funds in the data. Explanatory variables are as defined in Table 2. Dummy variables are included for the continents in which assets are primarily located, and the funds' primary strategy (30 dummy variables in total). Models (16) and (17) present the full sample and different right-hand-side variable to check for collinearity problems. Models (18) and (19) show robustness exclusion of the US funds and the HFN Data, respectively. Models (20) shows a two-step regression whereby the first step is a logit regression on a dummy variable equal to one for offshore registrations, and the second step is a Heckman sample selection regression given the results in the first step. White's HCCME is used in all regressions.

Variable	Model (16): Full Sample		Model (17): Full Sample		Model (18) Excluding US Funds		Model (19): CISDM Data only, Excluding HFN Data		Model (20a): Heckman Sample Selection [1st Step]		Model (20b): Heckman Sample Selection [2nd Step]	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	12.535	3.187***	16.145	3.192***	17.588	3.512***	21.698	4.665***	-1.916	-6.052***	32.388	4.071***
Hedge Fund Regulation Variables												
Log Minimum Capitalization	-0.040	-4.121***	-0.026	-2.001**	-0.028	-2.028**	-0.031	-2.534**			-0.030	-1.407
Restrictions on Location of Key Service Providers			-0.567	-1.737*	-1.417	-2.124**	-0.129	-0.281			-0.397	-0.485
Marketing Bank			0.240	0.833	0.072	0.153	-0.063	-0.149			0.219	0.373
Marketing Fund Distribution Company			0.525	1.271	0.512	1.110	0.937	0.594			1.459	0.948
Marketing Via Wrappers			-0.766	-1.962**	-1.477	-1.985**	-0.725	-0.489			-0.717	-0.474
Marketing Private Placement			-0.181	-0.231	-0.153	-0.168	-1.608	-1.738*			-2.191	-1.462
Country GNP and Legal Origin												
Log GNP Per Capita	-0.654	-2.077**	-0.998	-2.476**	-1.282	-2.954***	-1.270	-3.085***			-2.224	-3.182***
French Legal Origin	-0.104	-0.365	-0.429	-0.833	-0.929	-1.680*	-1.130	-2.011**	1.252	2.741***	-2.181	-2.521**
German Legal Origin	0.928	0.764	0.803	0.563	1.472	0.805	3.032	5.785***	0.024	0.021	2.970	1.356
Fund Characteristics												
Yearly Capital Redemptions	0.338	2.274**	0.322	2.168**	0.787	1.469	0.572	2.266**			0.386	0.791
Log Assets	-0.310	-7.835***	-0.307	-7.610***	-0.284	-5.611***	-0.330	-6.791***			-0.301	-5.385***
Log Age	0.507	3.396***	0.502	3.413***	0.485	3.083***	0.512	3.930***			0.443	2.102**
Minimum Investment	-1.187E-09	-0.078	-1.174E-09	-0.067	-1.259E-09	-1.872*	-2.040E-09	-1.674*			-4.322E-09	-1.062
Management Fee	0.132	1.783*	0.132	1.744*	0.156	2.059**	0.059	1.725*			0.170	1.855*
Performance Fee	0.029	1.739*	0.029	1.750*	0.046	2.138**	0.014	0.692			-0.028	-1.004
HFN Data Dummy	0.024	0.063	0.007	0.019	-0.368	-0.924						
Heckman's Lambda											-0.464	-2.042**
Dummy Variables for Primary Location of Assets?	Yes		Yes		Yes		Yes		Yes		No	
Dummy Variables for Primary Fund Strategy?	Yes		Yes		Yes		Yes		Yes		No	
Model Diagnostics												
Number of Observations		2137		2137		682		1127		2137		553
Adjusted R ² (Pseudo R ² for Model 16a Step 1)		0.202		0.202		0.257		0.229		0.321		0.094
Loglikelihood		-4922.921		-4921.635		-1358.204		-2324.839		-829.836		-1168.873
F-Statistic (Chi Square for Model 16a Step 1)		11.43***		10.46***		7.54***		10.30***		784.075***		4.57***
Akaike Information Statistic		4.657		4.660		4.092		4.191				4.289

Table 8. Regression Analyses of Fixed Fees and Performance Fees

This table present Tobit regression analyses of the determinants of the fixed management fee % and the carried interest performance fee % for the cross-section of funds in the data. Explanatory variables are as defined in Table 2. Dummy variables are included for the continents in which assets are primarily located, and the funds' primary strategy (30 dummy variables in total). Models (21) and (22) show the full sample. Models (23)-(24) and Models (25)-(26) show robustness exclusion of the US funds and the HFN Data, respectively. White's HCCME is used in all regressions.

Variable	Full Sample				Excluding US Data				CISDM Data Only; Excluding HFN Data			
	Model (21): Fixed Fees		Model (22): Performance Fees		Model (23): Fixed Fees		Model (24): Performance Fees		Model (25): Fixed Fees		Model (26): Performance Fees	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	3.380	1.636	13.407	1.251	4.028	1.770*	24.968	3.049***	4.444	1.565	23.763	2.613***
<u>Hedge Fund Regulation Variables</u>												
Restrictions on Location of Key Service Providers	0.025	0.320	-0.054	-0.133	-0.068	-0.210	-3.935	-3.323***	-0.032	-0.328	0.321	1.011
Marketing Via Wrappers	0.263	2.067**	0.661	0.999	0.187	0.587	-3.968	-3.437***	0.468	2.185**	-0.269	-0.392
Marketing Private Placement	-0.136	-0.388	4.729	2.579**	-0.137	-0.343	6.043	4.174***	-0.263	-0.528	0.460	0.288
<u>Country GNP and Legal Origin</u>												
Log GNP Per Capita	-0.188	-1.098	-0.648	-0.729	-0.216	-1.140	-0.551	-0.809	-0.297	-1.272	-0.326	-0.436
French Legal Origin	-0.344	-1.485	2.528	2.102**	-0.402	-1.600	0.971	1.073	-0.461	-1.461	0.449	0.444
German Legal Origin	0.302	0.811	-4.423	-2.274**	0.361	0.861	-0.814	-0.537	2.683	2.620***	1.884	0.573
<u>Fund Characteristics</u>												
Yearly Capital Redemptions	-0.030	-0.464	0.349	1.022	-0.058	-0.258	1.300	1.607	-0.037	-0.328	1.523	4.181***
Log Assets	0.017	1.305	0.123	1.869*	0.006	0.269	-0.020	-0.242	0.037	1.865*	0.011	0.172
Log Age	-0.099	-2.426**	-1.064	-5.033***	-0.088	-1.072	-0.506	-1.704*	-0.204	-2.997***	-0.707	-3.236***
Minimum Investment	-1.676E-10	-0.100	-7.873E-09	-0.906	-1.845E-10	-0.099	-8.137E-09	-1.217	2.330E-10	0.118	-6.935E-09	-1.096
HFN Data Dummy	0.035	0.444	-0.680	-1.645*								
Dummy Variables for Primary Location of Assets?	Yes		Yes		Yes		Yes		Yes		Yes	
Dummy Variables for Primary Fund Strategy?	Yes		Yes		Yes		Yes		Yes		Yes	
<u>Model Diagnostics</u>												
Number of Observations	2137		2137		682		682		1127		1127	
Loglikelihood	-2706.560		-6079.098		-895.938		-1766.231		-1585.193		-2899.912	
ANOVA based fit measure	0.094		0.486		0.047		0.117		0.075		0.075	