The Wisdom of the Right Crowd: Service Provider Choice

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Many researchers have examined the sources of hedge fund performance over time. Building on the asset class factor model presented by Sharpe [1992], Fung and Hsieh [1997a] identified five dominant hedge fund investment styles, proposed a framework for analysis of trading strategies and elaborated further on this framework in a subsequent series of papers [Fung and Hsieh 1997b, 2000, 2001, 2002a, 2002b and 2003].

There is also substantial literature on the use of factor analysis in predicting hedge fund performance, stemming originally from the seminal work by Fama and French [1993]. Recently, for example, Avramov, Barras and Kosowski [2010] examined the predictability of hedge fund performance with reference to the default spread on bonds rated by Moody's, the equity market dividend yield, the VIX index and net aggregate flows into the hedge fund industry.

Separately, a number of papers have investigated the question of short- and long-term hedge fund performance persistence; although the evidence of this appears to be mixed, most recently, Ammann, Huber and Schmid [2010] found evidence of significant performance persistence and the ability to improve it through strategy distinctiveness.

In parallel, there have been efforts to analyze and predict hedge fund performance with reference to qualitative factors. Liang [1998] compared the performance of hedge funds to mutual funds and, among other things, traced the relationship of hedge fund returns to certain characteristics of the funds, e.g., the existence of a high water mark, incentive fees, fund size and lock-up period.

This line of analysis was extended to focus on operational risk by Liang [2000] and Brown, Goetzmann, Liang and Schwarz [2008], among others. The latter paper, for example, used information filed by hedge fund managers with the Securities and Exchange Commission (SEC) on Form ADV to create an "ω score" for hedge fund operational risk, based on identified conflict of interest issues, concentrated ownership and reduced leverage. More recently, Brown, Goetzmann, Liang & Schwarz [2010] studied a sample of due diligence reports produced by a major hedge fund due diligence firm to derive a measure of operational risk based on inadequate or failed internal processes, misrepresentations and inconsistencies, among other things (parenthetically, they determined that operational risk as defined thereby did not affect investors' propensity to invest based on high past returns).

A major differentiating characteristic among hedge funds is their choice of key service providers, specifically a fund's designated prime broker(s), administrator, auditor and domestic law firm. These key service providers (hereafter, "KSPs") are generally set forth in the fund's subscription documents and marketing materials, and databases that compile and disseminate fund performance often also provide the names of a fund's KSPs.

Due diligence on funds generally includes consideration and verification of the fund's KSPs and the services provided by them (for example, the illustrative due diligence questionnaire produced by the Alternative Investment Management Association, a global trade association of the hedge fund industry, requests detailed information on a fund's KSPs and the nature of the fund's relationships with them, including

the length of the relationship and the specific services provided). KSPs provide essential services to a fund, and, although these services are relatively straightforward, the firms that comprise each of the four groups of KSPs vary significantly in market presence, experience and resources. Accordingly, the most respected service providers are able to be highly selective in their choice of clients, and there is some evidence that certain firms can and do charge relatively higher prices for their services.

Liang [2002] noted that larger funds tend to be audited, and funds that are audited have fewer discrepancies in returns reported to multiple places. Additionally, Brown, Fraser & Liang [2008] found that larger funds tended to use better-known service providers. Apart from the above, though, relatively little consideration has been given to service provider choice as an indicator of fund performance. This paper asserts that a fund that currently reports employing the largest, best-known service providers is likely also to have reported superior absolute and risk-adjusted returns over a five- and ten-year time horizon relative to its peer group and that, conversely, funds that report lesser-known service providers or no KSPs at all are likely to have reported underperformance over these periods.

The functions and characteristics of the four key service provider groups are described below:

(a) Prime Broker

Prime brokers offer a package of services focused around processing of trades, provision of leverage and operational support. Prime brokers locate and lend securities to hedge funds, enabling them to establish short positions. Prime brokers also provide leverage and cash management services. The prime broker serves as a custodian and clearinghouse for many (if not all) of the fund's trades, and enables the fund to net its aggregate collateral requirements for any leverage the prime broker provides for these trades.

Prime brokers also provide a range of support services that may be important to establishing, building and maintaining the fund's business. Normally, the prime broker will provide at least daily, and sometimes real-time, position and portfolio reporting, often customized to the requirements of the fund. Services provided in the start-up phase may include consulting and assistance with recruiting, low-cost premises and on-site technology services. On an ongoing basis, a "capital introduction" team within the prime broker seeks to introduce the fund to potential suitable hedge fund investors, often via conferences and other events that the capital introduction team sponsors.

Typically, the fund pays the prime broker by way of financing spreads (including on the lending of securities), commissions from trading and by the fees that the prime broker earns from hypothecating securities in the fund's portfolio to other clients of the prime broker who wish to borrow them.

Over the past several decades, the prime brokerage business consolidated around the largest brokerage firms, including firms such as Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch and Morgan Stanley. During the recent financial crisis, in March 2008, the parent company of Bear Stearns came close to failing, resulting in it being acquired by JP Morgan. Later in the year, Lehman Brothers filed for bankruptcy and was acquired piecemeal by Barclays Bank and Nomura Securities, and Merrill Lynch was acquired by Bank of America.

As a result of Lehman's bankruptcy, many prime brokerage clients to which it had extended leverage were unable to withdraw their collateral. This caused many hedge funds to seek to diversify their counterparty risk by establishing relationships with additional prime brokers, typically with those perceived as the most creditworthy entities, including large foreign firms such as Credit Suisse and Deutsche Bank. As a result, many more hedge

funds now have relationships with more than one prime broker, and a group of fewer than ten prime brokers accounts for the vast majority of prime brokerage relationships. Consequently, it appears that a far higher percentage of hedge funds with long track records have relationships with at least one leading prime broker than was the case prior to the Lehman bankruptcy, and such a relationship is less of a differentiating factor than it once was.

(b) Administrator

The principal task of the fund administrator is to calculate the net asset value of the fund and the accounts of the partners, at specified intervals, in order to create financial statements for the fund. This generally entails reconciling statements from the fund's counterparties, obtaining valuations of fund assets from various sources, and processing subscriptions and withdrawals. These tasks may be highly complex for funds which trade actively, have many limited partners and frequent subscriptions and withdrawals, and hold significant amounts of difficult-to-value securities.

In the wake of various frauds – particularly the Madoff fraud of 2008 – many investors have become increasingly reluctant to invest in funds that do not have consistent and well-documented valuation policies and do not employ a respected unaffiliated administrator or custodian to produce net asset values.

220 firms are reported as the administrator by one or more funds in our dataset. Slightly under half of the funds, however, use one of a group of 25 administrators. Approximately a third of the population either do not report an administrator or report that they are self-administered.

(c) Auditor

The auditor's principal role is to review the fund's accounting practices and financial statements. The auditor will also do tax preparation work. Among the key accounting practices are the fund's valuation methodology. Typically, it will be straightforward for the administrator to price liquid securities, or securities priced in accordance with standard models. For other types of assets, however, the auditor may critique a set of "agreed upon procedures" developed by the investment manager.

As with administrators, investors have placed increasing emphasis on a fund's having a well-known, respected auditor, particularly in the wake of the Madoff scandal, where the auditor was a reportedly a one-man operation located in a strip mall. The wind-down of Arthur Andersen following its conviction for obstruction of justice in connection with the Enron affair has also motivated auditors to reduce reputational and business risk by taking steps to improve the quality of their procedures and clientele.

Almost 60% of the funds in our data set report an auditor that is either one of the "Big Four" accounting firms (Deloitte & Touche, Ernst & Young, KPMG and Pricewaterhouse Coopers) or Rothstein Kass, a firm with a very large funds practice.

(d) Legal counsel

Typically, a fund will retain legal counsel to prepare and update offering documentation, opine on certain regulatory and compliance matters and assist in the negotiation of agreements with counterparties (e.g., credit support agreements in connection with swaps transactions). Often multiple law firms will be required when, for example, a hedge fund has feeder funds with different domiciles, e.g., an "onshore" feeder fund in the United States and an "offshore" feeder fund in the Cayman Islands, Bermuda or other such jurisdiction.
It would be very difficult for a fund to come into existence without the use of a law firm, but many funds do not

choose to report them to databases. Additionally, we have differentiated between "offshore" legal advisors, who assist the fund in a narrow way in selected jurisdictions in which a few firms generally have an oligopoly, and the "onshore" law firms that are more easily differentiable by their client lists.

Funds use a broad variety of law firms, ranging from large New York and London firms, smaller firms with large funds practices (the two funds with the largest reported numbers of clients in our data set, Seward & Kissel and Schulte, Roth & Zabel, fall into this category), major firms in regional cities and smaller boutiques. The funds in our data set reported 315 law firms, including numerous "offshore" ones, and the market is relatively fragmented; the ten "onshore" firms with the largest numbers of clients account for less than a third of the funds in the data set, and more than half of the firms were reported as the legal adviser by two or fewer funds.

Fund Performance Data

We combined information from two databases, HFN (provided through Pertrac) and that of a large, well-known hedge fund consultant. The two databases have substantial overlap but are very different. HFN has a low subscription cost and comprises any funds that choose to report to it. The consultant's database is provided to clients in connection with its hedge fund research offering, and contains many funds on which its clients have requested research. Accordingly, such funds are likely to have better past performance, having attracted the interest of the consultant's clientele. There is, however, substantial overlap between the two databases.

It would be impracticable to accumulate data for all defunct funds and attempt to determine who their key service providers were, and if these had changed over time, or to determine when and if extant funds had changed their key service providers in the past; we chose instead to assess key service provider data for funds extant as of December 31, 2010. Although this necessarily introduces survivorship bias, we limited our dataset to funds that had reported at least five full years of monthly returns to one or both of these databases through December 2010 and had therefore all "survived" the period. We collected the monthly performance data for this period, as well as for the previous five years for those funds that had reported it. In order to eliminate duplicates and separate classes of the same fund, we used only one of any pair of funds with monthly return correlations exceeding 0.95. The resulting dataset comprised 1,972 funds with five years of data and a subset of 716 funds with ten-year data.

Generally, where there was overlap, we used the consultant's data, although we did not find examples of significant differences in the returns data provided by HFN and the consultant for the same fund. Each database enables funds to report their prime brokers, auditors, administrators and legal advisors; we collected this data as well.

The data relating to KSPs was collected in the early months of 2011 and therefore reflects the service providers that the funds were reporting at that time. It cannot be determined from the databases if a fund has added or changed KSPs in the past. As noted previously, various funds added prime brokers in the wake of the financial crisis of 2008 – 2009; similarly, under pressure from investors, some formerly self-administered funds have hired third-party administrators or changed their auditors to better-known firms. Addition of a prime broker is relatively straightforward, but replacing one of the other types of KSP entails time, effort and expense, and it seems reasonable to assume that a relatively small percentage of the funds in the dataset have chosen to do this.

Methodology and Results

We calculated annualized returns and annualized standard deviations of the monthly reported returns over

Exhibit 1: Summary Statistics - All Funds

Time Period	Annual Return	Annualized Standard Deviation	Sharpe Ratio	Sortino Ratio	Number of Funds
2006 – 2010	8.05%	14.99%	0.52	1.31	1,972
2001 – 2010	9.50%	14.29%	0.62	1.16	716

Exhibit 2: Summary Statistics - HFRX Global Hedge Fund Index

Time Period	Annual Return	Annualized Standard Deviation	Sharpe Ratio	Sortino Ratio
2006 – 2010	0.84%	7.51%	(0.19)	(0.23)
2001 – 2010	3.56%	5.86%	0.22	0.27

the five-year and ten-year (where available) periods for all the funds in the dataset. We annualized the 30-day Treasury total returns over these periods to calculate the Sharpe and Sortino ratios for each fund during the periods. The returns for the full dataset were as follows:

These results compare favorably with those of the HFRX Global Hedge Fund Index for the same periods, although survivorship bias is clearly relevant here:

This is to be expected, given that the dataset comprises only funds that have reported results continuously for five or ten years, and therefore have performed well enough to remain in business. Funds that were casualties of the recent financial crisis and stopped reporting performance were excluded by construction from the dataset, but poor performance late in their lives may be reflected in the HFRX index. Additionally, the HFRX is asset-weighted by strategy clusters, rebalanced quarterly, and only uses returns from funds with at least a two-year track record and $50 million in assets under management, further limiting its comparability to the dataset.

It is worth noting that the distributions of the performance and annualized standard deviation of the funds in our dataset showed substantial skewness over both time periods. Specifically, there were relatively numerous outliers with very high performance and low volatility (particularly downside volatility). This is to be expected, given that funds with very low performance and/or high volatility would not have been expected to have survived for the five or ten years necessary for them to be incorporated into our dataset.

Furthermore, the Sharpe and Sortino ratios, as measures of risk-adjusted performance, are calculated by dividing annualized performance in excess of the risk-free return by annualized volatility or annualized downside deviation, respectively. Accordingly, the distributions of the Sharpe and Sortino ratios of the funds in the dataset are even more skewed than the distributions of performance and volatility, since they represent the quotients of samples with "fat tails" of high-performing funds and funds with low volatility.

As a next step, we developed lists of "preferred" KSPs, defined as follows:*

(a) Prime brokers: the top nine by numbers of reported relationships, accounting for more than 85% of the prime brokerage relationships reported in the dataset.

(b) Administrators: the top 25 by numbers of reported relationships, accounting for 930 (or just under 50%) of the funds in the dataset.

* A full list of the preferred Key Service Providers used in this study are available from the author.

(c) Auditors: the "Big 4" auditors plus Rothstein Kass, representing 1,165 funds, or just under 60% of the funds in the dataset.
(d) Legal counsel: the top 12 "onshore" firms by numbers of reported relationships, representing 624 (or just under a third) of the funds in the dataset, but approximately half of the funds that reported an "onshore" law firm.

We compared the reported performance of funds with a preferred KSP in each category against the reported performance of the dataset as a whole. We found that, on average, funds that reported a preferred KSP also reported superior risk-adjusted performance relative to that of the full dataset (and, often, superior absolute performance as well).

Over the five-year period, the clearest indicator of superior reported performance seems to be the reported use of a preferred administrator, and in the ten-year period, the reported use of a preferred administrator and legal counsel. There are at least two possible explanations for this: (i) the relatively high market share of the preferred prime brokers and auditors, which causes their clientele's performance to approximate the mean more closely; and (ii) the possibility that the use of a top-tier administrator and legal counsel is an indicator of superior operational processes and a reduced likelihood of material misstatements of net asset value that could lead to fluctuations in valuation and increases in volatility.

We then considered whether the reporting of multiple preferred KSPs might have an additive effect on performance or, conversely, whether failure to report service providers, or reporting multiple non-preferred KSPs, could be linked to inferior performance:

.Exhibit 3: Five-Year Performance of Funds Reporting a Preferred KSP

Preferred KSP Reported	Annual Return	Annualized Standard Deviation	Sharpe Ratio	Sortino Ratio	Number of Funds
Prime Broker	8.29%	13.67%	0.55	1.09	1,058
Administrator	8.61%	13.56%	0.59	1.27	930
Auditor	8.19%	14.19%	0.55	1.14	1,165
Legal Counsel	8.39%	13.85%	0.59	1.16	624
Full Dataset:	8.05%	14.99%	0.52	1.31	1,972

Exhibit 4: Ten-Year Performance of Funds Reporting a Preferred KSP

Preferred KSP Reported	Annual Return	Annualized Standard Deviation	Sharpe Ratio	Sortino Ratio	Number of Funds
Prime Broker	9.40%	12.82%	0.67	1.19	398
Administrator	9.91%	12.95%	0.70	1.29	337
Auditor	9.90%	13.33%	0.69	1.27	414
Legal Counsel	9.73%	12.50%	0.73	1.37	241
Full Dataset:	9.50%	14.29%	0.62	1.16	716

Exhibit 5: Five-Year Performance and Reporting of KSPs

Fund Reports:		Annual Return	Annualized Standard Deviation	Sharpe Ratio	Sortino Ratio	Number of Funds
(A)	4 Preferred KSPs	8.46%	12.48%	0.64	1.30	330
(B)	≥2 Preferred KSPs; No Non-Preferred	8.76%	13.34%	0.63	1.35	523
(C)	≥1 KSP	8.79%	13.77%	0.62	1.33	615
(D)	≥1 Non-Preferred KSP	7.74%	15.54%	0.48	1.36	1,004
(E)	>1 Non-Preferred KSP	7.84%	15.82%	0.48	2.20	321
(F)	No KSPs	7.64%	15.52%	0.47	1.12	353
	Full Dataset:	8.05%	14.99%	0.52	1.31	1,972

Exhibit 6: Ten-Year Performance and Reporting of KSPs

Fund Reports:		Annual Return	Annualized Standard Deviation	Sharpe Ratio	Sortino Ratio	Number of Funds
(A)	4 Preferred KSPs	9.83%	11.52%	0.79	1.39	119
(B)	≥2 Preferred KSPs; No Non-Preferred	9.94%	12.38%	0.74	1.31	179
(C)	≥1 KSP	10.16%	12.82%	0.72	1.27	215
(D)	≥1 Non-Preferred KSP	9.27%	14.58%	0.59	1.14	386
(E)	>1 Non-Preferred KSP	10.06%	14.92%	0.63	1.27	122
(F)	No KSPs	9.07%	16.04%	0.51	1.04	115
	Full Dataset:	9.50%	14.29%	0.62	1.16	716

It can be seen that during both periods the annualized absolute performance of the group reporting four preferred KSPs significantly exceeded that of the dataset as a whole (by 41 and 33 basis points respectively in the five- and ten-year performance groupings). Additionally, annualized volatility was considerably lower (by 251 and 277 basis points respectively). The combination results in significantly higher risk-adjusted returns.

The groups that report at least two preferred KSPs and do not report any non-preferred ones produced almost as high risk-adjusted returns in both time periods. They are followed, again in both time periods, by the groups that report at least one KSP, preferred or otherwise.

In the five-year period, the groups that reported non-preferred KSPs had lower absolute and risk-adjusted returns than the dataset as a whole. In the ten-year period, however, funds that reported one or more non-preferred KSPs had absolute performance broadly in line with the dataset, but higher volatility that brought their risk-adjusted performance in aggregate generally below that of the peer group.

A possible explanation for this difference could be greater pressure in the past five years for funds to use premium KSPs, leading to increased selectivity on the part of the KSPs with respect to the clients they are willing to accept. Older funds may have had less pressure to use a name-brand lawyer, auditor or administrator when they were formed, and, if they have survived ten years, may not feel compelled to change their KSPs at this stage.

It seems clear that funds which do not report KSPs do significantly worse than their peer group. Within the five-year period, funds that failed to report any KSPs underperformed the full dataset by 41 basis points per annum and reported 53 basis points additional annualized volatility. For the ten-year period, the group underperformed the full dataset by 43 basis points annually and exhibited 175 basis points additional annualized volatility.

It may be that failure to report KSPs is a sign of loose internal processes that give rise to lower returns and higher volatility. It is also possible that funds that do not report KSPs prefer not to publicize the fact that they use less well-known vendors – or that they do not use any at all, which could itself be a sign of internal problems.

To test the robustness of these conclusions, we performed two-tailed hypothesis tests at the .05 significance level on the distributions of the Sharpe ratios of the various samples relative to those of the overall population, and also calculated the relevant p-values. The results were as follows:
For the five-year period, the statistical significance of the benefit of reporting a preferred administrator and legal counsel could be asserted with a high degree of confidence; for the ten-year period, this applied to all categories of KSP (albeit somewhat less for prime brokers).

Additionally, as can be seen in the following two tables, the conclusion that reporting multiple key service providers (particularly preferred ones) is a marker of outperformance can be asserted with a high degree of confidence for both the five- and ten-year periods:

Exhibit 7: Five-Year Performance of Funds Reporting a Preferred KSP

Preferred KSP Reported	Sharpe Ratio	T-Statistic	*P*-Value	Number of Funds
Prime Broker	0.55	1.66	.0964	1,058
Administrator	0.59	3.21	.0014	930
Auditor	0.55	1.32	.1872	1,165
Legal Counsel	0.59	2.51	.0123	624
Full Dataset:	0.52			1,972

Exhibit 8: Ten-Year Performance of Funds Reporting a Preferred KSP

Preferred KSP Reported	Sharpe Ratio	T-Statistic	*P*-Value	Number of Funds
Prime Broker	0.67	2.18	.0301	398
Administrator	0.70	2.87	.0044	337
Auditor	0.69	2.76	.0060	414
Legal Counsel	0.73	3.00	.0030	241
Full Dataset:	0.62			716

Exhibit 9: Five-Year Performance and Reporting of KSPs

Fund Reports:		Sharpe Ratio	T-Statistic	*P*-Value	Number of Funds
(A)	4 Preferred KSPs	0.64	3.32	.0010	330
(B)	≥2 Preferred KSPs; No Non-Preferred	0.63	3.55	.0004	523
(C)	≥1 KSP	0.62	3.41	.0007	615
(D)	≥1 Non-Preferred KSP	0.48	-1.80	.0729	1,004
(E)	>1 Non-Preferred KSP	0.48	-0.95	.3451	321
(F)	No KSPs	0.47	-1.50	.1338	353
	Full Dataset:	0.52			1,972

Exhibit 10: Ten-Year Performance and Reporting of KSPs

Fund Reports:		Sharpe Ratio	T-Statistic	*P*-Value	Number of Funds
(A)	4 Preferred KSPs	0.79	3.72	.0003	119
(B)	≥2 Preferred KSPs; No Non-Preferred	0.74	2.95	.0036	179
(C)	≥1 KSP	0.72	2.80	.0055	215
(D)	≥1 Non-Preferred KSP	0.59	-0.88	.3814	386
(E)	>1 Non-Preferred KSP	0.63	0.34	.7362	122
(F)	No KSPs	0.51	-2.15	.0333	115
	Full Dataset:	0.62			716

Conclusions

Reporting the use of preferred KSPs appears to be a marker of outperformance over historic five- and ten-year time horizons among funds which have reported complete track records for these periods to at least one of two databases used in this study. Of the four types of KSPs, prime brokers and auditors appear to have de facto oligopolies, while administrators and legal counsel are more fragmented. In the cases of prime brokers and auditors, the members of the oligopoly were designated as the preferred providers, while in the cases of administrators and legal counsel, the largest firms, used by approximately half the dataset in aggregate, were designated as the preferred providers.

It cannot be determined from the databases whether or not a fund's KSPs have changed over time, but for all categories of KSP, funds using the preferred providers had risk-adjusted returns significantly superior to those of the dataset as a whole, in both the five- and ten-year periods. The greatest outperformance was shown by funds using preferred administrators and legal counsel.

Funds reporting a complete set of preferred KSPs outperformed those with some but not all preferred KSPs. Funds reporting non-preferred KSPs tended to underperform the dataset, and the greatest underperformance was shown by funds that did not report KSPs, which may indicate the inadequacy of the KSPs used by these funds or that these funds do not use KSPs, which could in turn be an indicator of underperformance.

It can be conjectured that the most popular KSPs, which have the luxury of being more selective in the clients they accept, may choose to work only with those clients they deem to have the greatest chance of success, whether by virtue of the pedigree and track record of the principals, anticipated ability to raise assets or other factors. The KSPs used by the fund may in turn have a signaling effect for other vendors, counterparties and investors, which may itself increase the fund's prospects for outperformance. This, if true, would be an example of successful collective due diligence by experienced market participants: the wisdom of a crowd, in this case, the crowd best placed to predict a fund's likelihood of superior performance. The views of Groucho Marx notwithstanding, if you are a hedge fund manager, it may be a good idea to belong to this club if they will have you as a member.

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