Size vs. performance in the hedge fund industry

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Through the years, the number of global hedge fund managers has increased overall. However, the ratio of hedge fund starts ups to closings continues to generate concerns over basic issues related to back office operations, transparency, capacity, and style drift. In this study, I present the findings of a size versus performance study of the hedge fund industry to determine the extent to which operational issues affect the industry's growth and the resulting impact on investors.

Introduction to the size versus performance study

Investors have witnessed near exponential growth in the alternative investments industry in the last decade, with studies citing some 6,000 hedge funds with U.S.$ 1 trillion in assets, up from U.S.$ 50 billion in 1990. As a result, the number of hedge fund managers is up from approximately 1,000 in the late 1990s to more than 6,000 in 2003, which makes it increasingly important to rely on rigorous due diligence when selecting the best performing managers within the various investment styles and strategies.

While the number of managers has grown overall, the ratio of hedge fund starts ups to closings within the hedge fund industry generates concerns over basic issues related to back office operations, transparency, capacity, and style drift. While approximately 700-800 hedge funds closed in 2002, another 800-900 new firms began operations. To what extent do operational issues related to growth and size stunt the industry's growth? And, if that is the case, then how does this affect investors?

Our interest in examining whether portfolio size is linked to diminishing returns has evolved from observations of top hedge fund managers in large funds, such as Tiger and Soros, who left to start successful hedge funds that closed to new investment at U.S.$ 500 million or U.S.$ 1 billion, which is far smaller than the funds where they began their careers. At its peak, Tiger had reached U.S.$ 22 billion, and Soros had reached U.S.$ 23 billion.

As background, consider that as a group, hedge funds are relatively smaller than their financial counterparts when measured in terms of assets, staff size, and years in business. During the three-year period between 1999 and 2001, LJH confirmed that size distribution remained fairly constant with slightly more than half of all hedge funds smaller than U.S.$ 25 million, approximately 80 percent of hedge funds smaller than U.S.$ 100 million, and 5 percent of all hedge funds larger than U.S.$ 500 million (Figure 1). Although many investors do not consider investing with firms smaller than U.S.$ 50 million, the data supports the view that these are indeed strong performing funds.

According to the 2002 Putnam-Lovell paper on the possible institutionalization of hedge funds, statistical observation suggests the distribution of hedge funds by size continues to trend downward slightly, reporting that the average hedge fund size is U.S.$ 87 million with a median base of U.S.$22 million. The implications of this might be an increase in niche opportunities and new strategies, as well as a possible change in allocation policy to smaller, more nimble managers.

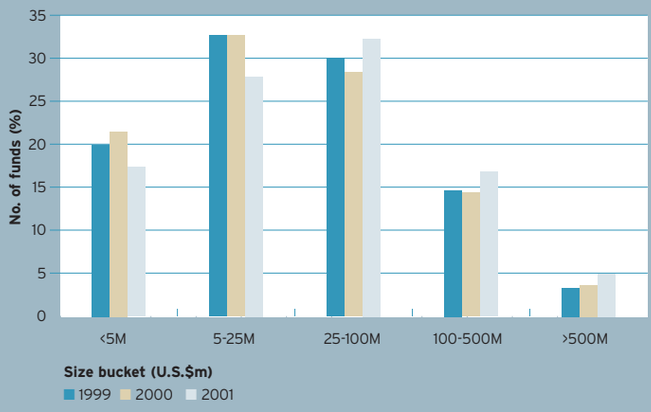

Figure 1: Size distribution of hedge funds
Source: Van Hedge Fund Advisors

Advantages and disadvantages of a large asset base

Advantages of a large asset base include more resources for research, increased ability to attract and retain investment talent, increased efficiency in brokerage, better access to companies, and greater bargaining power with broker/dealers.

However, challenges remain as to how to find alpha and identify the next generation of stars, which is a vital concern due to the fact that larger hedge funds also have significant disadvantages. Liquidity costs, for example, are significant and smaller funds are able to put all of their money into their best ideas. Getting in and out of trades can be more difficult for the larger funds, especially with respect to their reduced ability to short. To compensate, sub-optimal investment tactics may have to be adopted. Slippage may also occur with large orders.

Also worth noting are the psychological fears and career risks that can emerge as funds grow. Managers may test their limits by continuing to take in new money and increase their level of risk in an effort to boost returns. However, this may lead to growing concern over reputational risk, including possible dismissal or bankruptcy if the fund suffers. Organizational diseconomies are also evident. Managing money is different than managing people and managing a business, and the quality of personnel is difficult to maintain as fund size grows.

Methodology

Our study reviewed verifiable, 'clean' data from 268 hedge funds in six strategies, each of which had monthly returns and assets under management continuously available for the time period of January 1995 through December 2002. Realizing that many past hedge fund studies have traditionally been incomplete, inaccurate, and prone to suffer from a number of biases, the research team focused on a small-sample size with the characteristics of a stratified sample from within the hedge fund universe. The sample included both funds that stopped reporting and funds that started operation during the same period, which ranged from January 1995 – December 2001.

With the goal of determining whether smaller funds outperformed larger funds, we measured three size-mimicking portfolios of equally weighted, monthly returns. We classified funds based on assets under management into three buckets, small (less than or equal to U.S.$ 50 million), medium (U.S.$ 50 million – U.S.$ 150 million), or large (more than U.S.$ 150 million).

Because assets under management are usually updated at year-end, the study measured performance beginning in January and then repeated the measurement each January thereafter for the duration of the study. Managers that entered the database during the year were allocated to one of

	Mean	(t stat)	St. Dev.	Skewness	Kurtosis	Jarque-Bera	# of Funds	Mean	(t stat)	St. Dev.	Skewness	Kurtosis	Jarque-Bera	# of Funds
	Long/Short Equity							**Convertible Arbitrage**						
Small	2.27	(6.73)	3.08	0.48	0.45	3.98		1.61	(10.27)	1.44	0.93	5.13	104.29	
Medium	1.19	(3.67)	2.97	0.48	3.80	53.90		1.04	(10.44)	0.91	-1.23	3.25	58.58	
Large	1.39	(3.71)	3.44	-0.18	2.45	21.54		1.06	(9.99)	0.97	-1.95	6.88	219.26	
All	1.77	(5.48)	2.97	0.38	0.99	5.48	60	1.39	(11.51)	1.10	-0.39	3.33	40.88	30
	Market Neutral							**Fixed Income**						
Small	1.10	(10.02)	1.01	0.20	0.57	1.69		0.89	(9.64)	0.84	-1.30	4.43	92.43	
Medium	0.65	(4.25)	1.40	-0.26	0.29	1.28		0.52	(4.04)	1.19	-1.58	4.39	102.35	
Large	0.42	(2.55)	1.51	-1.03	4.41	83.26		0.92	(5.32)	1.59	1.04	7.93	235.55	
All	0.91	(9.36)	0.89	-0.12	0.11	0.25	54	0.79	(8.28)	0.88	-2.06	8.02	284.87	44
	Global Macro							**Distressed**						
Small	1.16	(4.39)	2.43	0.12	-0.10	0.25		1.16	(6.25)	1.70	-1.10	6.64	171.57	
Medium	1.00	(3.92)	2.33	0.41	0.46	3.07		1.04	(6.12)	1.56	-0.18	2.95	31.02	
Large	1.98	(4.26)	4.27	0.09	0.51	1.03		0.73	(3.96)	1.69	-3.23	18.28	1315.55	
All	1.23	(4.83)	2.34	0.31	0.01	1.37	51	1.08	(6.64)	1.49	-1.76	8.27	282.94	29

Figure 2: Impact of size on performance

three portfolios based on initial assets under management, and the portfolio was rebalanced accordingly. 'Dead' funds remained in the portfolio until the month of their last reporting, at which time the portfolio was rebalanced to account for their exit.

Data analysis

Figure 2 provides the results that emerged when the sample of funds was allocated to three portfolios by size and results.

The evidence is clear: Size does impact performance

The emerging pattern, as shown in Figures 3 and 4, clearly supports the premise that smaller funds outperform larger funds. Thus, the conclusion that size erodes returns.

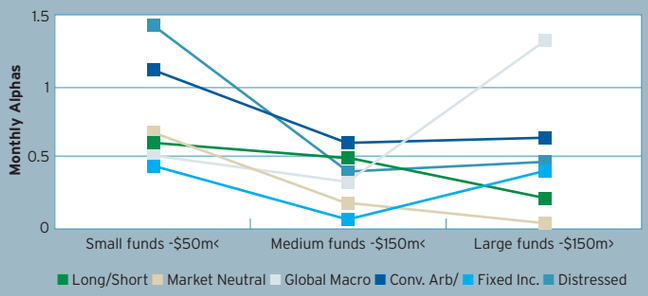

Figure 3: Size erodes performance

However, the study also showed that mid-sized funds performed the worst, which suggests the concept of 'mid life crisis' for hedge fund managers. While smaller funds tend to outsource certain functions to presumably leading service providers and larger, institutionalized firms have top tier processes, mid-size firms tend to be in limbo in terms of the opportunities and processes required to attain optimum performance.

Interesting to note is the fact that global macro managers proved to be the exception to the rule in this study as they proved their ability to sustain performance regardless of size. These managers trade in different markets, maintain minimal infrastructure, and benefit from economies of scale.

	Small	Medium	Large
1 Yr. Mortality Rate	3.48%	3.79%	2.03%
2 Yr. Mortality Rate	8.45%	10.19%	2.78%
3 Yr. Mortality Rate	11.81%	20.38%	2.86%
4 Yr. Mortality Rate	18.93%	34.47%	3.57%
5 Yr. Mortality Rate	23.69%	38.65%	3.57%
6 Yr. Mortality Rate	27.22%	53.00%	3.57%
7 Yr. Mortality Rate	32.00%	66.00%	3.57%

Figure 4: Medium funds suffer a midlife crisis

Global macro has been in the spotlight recently as the changing pace of the global economies has led to traditional investors' having a hard time coping with the correlation, or lack thereof, between the different markets across the world. In theory, global macro managers have the resources and skills to use sophisticated strategies to encompass all and profit from global trends, while traditional managers have limits on the style and scope of their investments.

We also evaluated results on a risk-adjusted basis and found that Sharpe ratios remained the same, as shown in Figure 5.

Convertible arbitrage, an often-used hedge fund strategy that utilizes convertible securities as part of a diversified alternative investment portfolio, also proved to be an exception to these findings as smaller funds continued to show the same relative level of volatility as larger funds.

As background, consider that in its most basic form, arbitrage entails purchasing a convertible security and selling short the underlying stock to create a market neutral position. Returns can be broken down into static and dynamic. Static return is generated by the receipt of a coupon or dividend in addition to the rebate on the short selling of the underlying stock, less

	Unhedge Avg. SR	Beta Hedged	Hedged Beta/Sum	3 Factor	3 Factor/Sum Beta
	Long/Short Equity				
Small	0.60	0.60	0.53	0.77	0.66
Medium	0.26	0.17	0.07	0.21	0.06
Large	0.28	0.19	0.11	0.30	0.20
All	0.46	0.43	0.31	0.62	0.42
	Market Neutral				
Small	0.68	0.68	0.61	0.64	0.56
Medium	0.17	0.13	0.16	0.04	0.06
Large	0.01	0.02	0.05	0.00	0.03
All	0.56	0.55	0.53	0.48	0.46
	Global Macro				
Small	0.31	0.24	0.18	0.30	0.23
Medium	0.25	0.16	0.12	0.16	0.11
Large	0.37	0.32	0.27	0.35	0.28
All	0.35	0.29	0.23	0.34	0.26

	Unhedge Avg. SR	Beta Hedged	Hedged Beta/Sum	3 Factor	3 Factor/Sum Beta
	Convertible Arbitrage				
	0.83	0.81	0.52	0.87	0.55
	0.69	0.67	0.43	0.67	0.42
	0.67	0.66	0.42	0.62	0.37
	0.88	0.87	0.54	0.89	0.54
	Fixed Income				
	0.56	0.53	0.47	0.52	0.45
	0.09	0.04	-0.03	0.00	-0.08
	0.32	0.27	0.15	0.24	0.12
	0.44	0.39	0.25	0.36	0.21
	Distressed				
	0.44	0.38	0.27	0.37	0.27
	0.40	0.34	0.22	0.41	0.28
	0.19	0.12	0.04	0.06	-0.02
	0.45	0.39	0.25	0.42	0.26

Figure 5: Sharpe Ratio Data

any financing costs. The dynamic portion of the return is achieved when the arbitrageur dynamically hedges the position by buying or selling more or less of the underlying stock. Dynamic returns have comprised the largest portion of a convertible arbitrageur's performance in the last several years and this has certainly been the case more recently, in light of the high number of low coupon paying convertibles coming to market. However, the level of market volatility has been high, providing arbitrageurs with the opportunity to capture additional returns by altering the position's hedge ratio.

Estimates of volatility could be afflicted by the problem of 'stale prices' that could be more severe with smaller funds than with larger ones.

Implications

In conclusion, the study's implication is that manager selection should be biased towards those that are nimble and responsive, and which generate alpha. Smaller funds can put all of their money into their best ideas, yet larger, more senior funds often find it difficult to put continued inflows to work due to the constraints of internal asset allocation guidelines and policies. With a fixed number of managers in place, putting a few more billion dollars to work might interfere with internal allocation infrastructure. This, in turn, can lead to creation of a special fund that specializes in emerging managers, and may require a more in-depth, analytical due diligence process guided by a senior analyst and risk officer capable of making a 'judgment call.' Ongoing due diligence is also critical for a portfolio of smaller, emerging hedge funds, and the implications for portfolio construction are obvious. Modeling portfolios to ensure proper diversification among strategies and managers is critical. Results of this study support the need to evaluate funds of all sizes when making hedge fund allocations.