Mila Getmansky
Sloan School of Management
30 Wadsworth Street, Bld E53, Room 376
Cambridge, MA 02139
Phone: 617-253-4361
Fax: 501-325-9912
mgetman@mit.edu

Process of Growth of a Hedge Fund: Impact of Size on Performance

ABSTRACT

A theory-based feedback model is developed to study the process of growth of a hedge fund and the impact of its size on performance. It is proposed that market environment, organizational structure of a hedge fund, behavior of investors and managers, and reaction of the market are factors in the main finding that small hedge funds are generally more efficient and perform better than large hedge funds in the short and long terms. The result draws support from organizational studies literature as well as some results from finance and economics.

INTRODUCTION

Starting with the collapse of a huge hedge fund called Long Term Capital Management in 1998, more of large hedge funds started to fail. For example, Jeffrey Vinik's announcement at the end of October, 2000 that he would be shutting down his $4.2 billion fund by the end of the year followed similar retreats by George Soros,

Stanley Druckenmiller and Julian Robertson, all of them stars in the hedge fund industry. An interesting idea was brought up recently that the retreats only confirm their peculiar nature: hedge funds are most effective when they are small (The Economist, December 2nd, 2000). The idea that the size of a hedge fund directly impacts its' returns is probably too simple and not true. However, the idea that a size of a hedge fund indirectly, through some feedback mechanism, leads to lower returns of a fund, is interesting and worthwhile exploring.

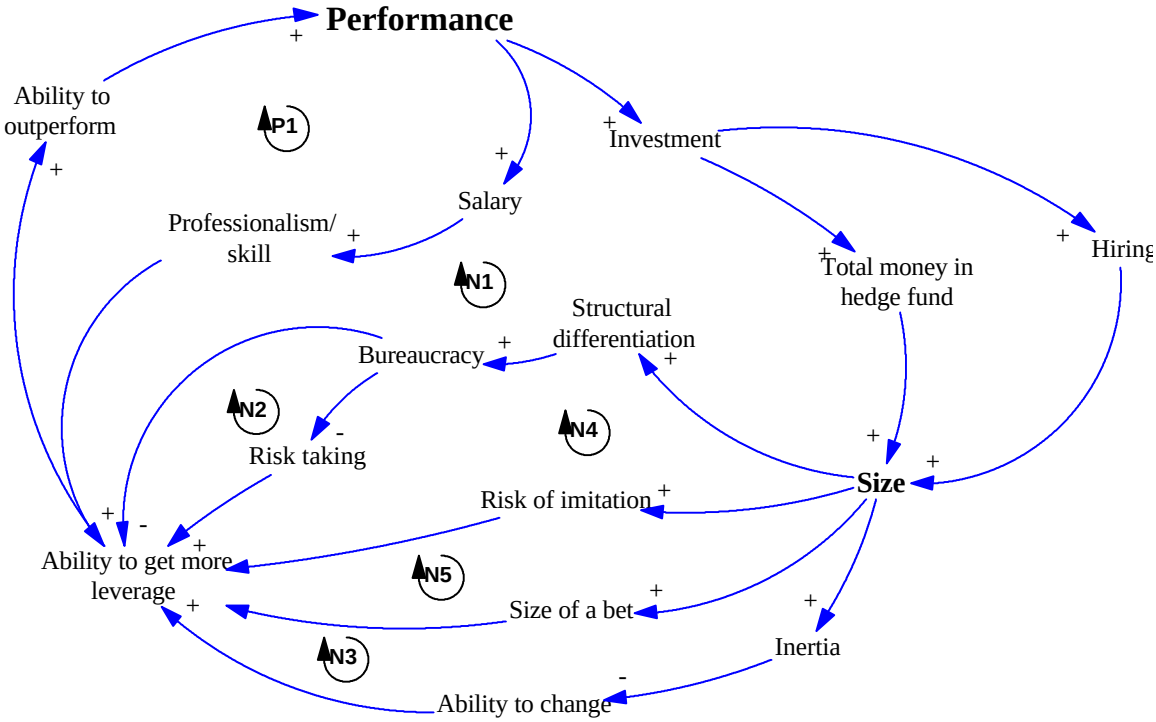
Bonds, stocks, and mutual funds are more familiar and thoroughly studied than hedge funds. First of all, there are only $350 billion currently in the hands of hedge-fund managers, compared to $5 trillion in the hands of mutual fund managers. At present, about 1-2% of all investable money is parked in hedge funds. Hedge funds are generally more risky than mutual funds; therefore, they have a higher potential of bringing higher returns to their investors. All hedge funds can go both long and short in markets; they leverage their positions by borrowing; and they seek to profit from market inefficiencies. Different hedge funds have various strategies they employ to beat the market.

The impact of a hedge fund's size on its performance should be studied both from an organizational as well as finance/economics point of view. As I found, market environment, organizational structure of a hedge fund, behavior of investors and managers, and reaction of the market are factors in the main finding that small hedge funds are generally more efficient and perform better than larger ones in the short and long terms. All these factors are going to be mentioned and discussed in the paper. However, more emphasis is given to the role of organizational structure in studying the effect of a size on a hedge fund's performance.

However, before reviewing research on the topic of organizational size, structure and performance, it is important to exactly define what we mean by a size (Scott, 1997). According to Scott (1997), most studies of the relation between organizational size and structure have used the number of participants (usually employees) as an indicator of a size. However, it is also common to see some size indicators such as square footage of floor space in a factory, the sales volume, or number of clients served during a given period (Scott, 1997). The latter studies are more common in the research that looks at a relationship between the size and the firm's performance. In a hedge fund world, size of a hedge fund is usually measured by the amount of money invested in a hedge fund. However, both the number of employees in a firm and assets managed by the firm are correlated (Lavino, 2000, Strachman, 2000). Therefore, organizational structure variables and performance metrics attributed to organizational structure are a function of a firm's size where size is the amount of employees employed by the firm. Performance metrics attributed to the finance/economics relationships are a function of a firm's size where size is the amount of assets under management. As I will conclude in my paper, both organizational structure channels and finance channels will lead to the same result: larger a hedge fund, worse its performance. However, the distinction in size definition is important for a methodology design and testing of the hypothesis.

I am presenting a theory-driven testable model that studies the process of growth of a hedge fund and the impact of its size on the performance. The model is a causal model with feedback mechanisms. Each link in the model is presented. Prior research from both organizational studies and finance fields is presented.

MODEL



The model is a series of interlinked feedback loops that represent the operation of a hedge fund both from organizational and market perspectives. The polarity of a loop is established by starting with one variable in a loop and going through the loop in the direction of arrows until returning to the same variable. As a general rule of thumb, a loop is positive (P) if there are even numbers of minus signs (-), or all signs are positive (+). A loop is negative (N) if the number of minus signs is odd. A loop is positive if a net effect is to reinforce an initial change. A loop is negative if a net effect is to counteract an initial change. An arrow from "variable 1" to "variable 2" has a positive sign if a partial derivative of "variable 2" with respect to "variable 1" is positive. An arrow is negative if the partial derivative is negative. This definition is consistent with Weick (1979: 171) use of a positive sign to indicate that a change in one variable leads to

a change in the same direction in the affected variable and use of a negative sign to indicate that an increase in one variable causes a decrease in the affected variable.

The model has one positive and five negative loops. All five negative loops link size and performance, thus, predicting that greater a size, worse is the performance of a hedge fund. All loops are going to be carefully described below. Variables from the model are presented in quotation marks in the paper.

Loop P1

The positive loop P1 describes an ability to attract professional and skillful people by paying them higher salaries. In a hedge fund world, salary is perfectly correlated with performance. Generally, investors are charged 20 percent of gains brought by a hedge fund. Therefore, hedge fund managers are interested in hiring skillful employees who will increase the performance of a hedge fund. They usually can find these people by luring them with high salaries. Human beings are usually reward-seeking according to an exchange theory (Simpson, 1972). They are going to work harder and smarter given higher rewards. Finding market inefficiencies is not a routine job; therefore, it requires an exceptional talent and ability to "watch the market" every second (Lavino, 2000, Strachman, 2000). Therefore, an arrow pointing from "Professionalism/skill" to "Ability to get more leverage" has a positive sign. Once a hedge fund is able to increase its ability to get more leverage from a market, its ability to outperform other hedge funds and traditional asset managers, like mutual funds, is increased. Therefore, a hedge fund performance is increased. Srilata Zaheer (1992, p.188) in the study of risk behavior of

foreign exchange traders also found that professionalism and skill are positively causally related to performance. In conclusion, the loop P1 is positive.

I personally interviewed a hedge fund manager in New York (let's call it XYZ fund). The manager provided a strong evidence for this P1 loop. He only hires the best people in the industry, who are able to outperform market and therefore, he pays them high salaries. The XYZ fund manager mentioned that professionalism and skill were a must for his fund and generally for all hedge funds in the industry. Hedge fund managers do not have time to train employees because they have to "follow the market" and exploit any inefficiencies in the market in the real time. The XYZ fund manager and his team work every day, including weekends, from 7 am to 9 pm. He even does not take lunch breaks away from his computer terminal.

Loop N1

The study of organizational size, structure and performance started at about the same time when hedge funds were formed, late 1940s, and definitely before they were a subject of analysis. James Worthy was one of the first social scientists who started to make causal relationships between a size of an organization, its structure and performance. He concluded: " The larger, more complex organizations are likely to become unadaptive and rigid, and find it difficult to meet requirements of economic and social change" (Worthy, 1950). According to Worthy (1950), trends toward increasing the complexity of organization and increasing the size of the administrative unit are both inefficient and costly to the management. In contemporary world, Worthy's conclusions are that a bigger organization has more bureaucracy, less morale and less output. Even

though Worthy's findings were disputed, a general trend was discerned since the beginning of 1950s: viewing structure as a dependent variable (Scott, 1975). Size and technology were two most important independent variables that affected an organizational structure (Scott, 1975). We will concentrate on size for this paper.

The relationship between a size of an organization and a relative size of administrative component (proxy for bureaucracy) were thoroughly studied. However, researchers came to differing conclusions. Some studies showed positive, negative or zero correlation between a size of an organization and a relative size of administrative unit (Scott, 1975). While the efforts of relating size and bureaucratization started to look fruitless, Blau (1970) and his associates came up with an idea of relating size to differentiation. The term differentiation refers specifically to the number of structural components that are formally distinguished in terms of any one criterion (Scott, 1975). In a remarkable series of propositions Blau (1970) has attempted to summarize and resolve these conflicts as follows. Large size is associated with structural differentiation, and differentiation, in turn, enlarges the administrative component. This occurs because differentiation increases the heterogeneity of work among the various subunits and individuals, creating problems of integration and coordination of effort. Therefore, the administrative component expands to assume these responsibilities (Scott, 1975).

According to this literature review, there is a strong evidence that there are two positive causal arrows going from "Size" to "Structural differentiation" and from "Structural differentiation" to "Bureaucracy." These relationships are depicted in the theoretical model. The administrative component of a hedge fund is not compensated on the basis of a hedge fund's performance. An increase of bureaucracy means more

reporting, coordination between different employees and groups, and other activities that take away from a hedge fund's ability to get more leverage in a market. Therefore, a causal link between "Bureaucracy" and "Ability to get more leverage" is negative. The positive links between "Ability to get more leverage", "Ability to outperform," and "Performance" were discussed in Loop P1 section. The causal relationship between performance and a size of a hedge fund is positive. Greater performance of a hedge fund, more investors are putting new money "Investment" into the fund. The finding is ubiquitous in financial markets. Investors feel more comfortable about putting their money with managers who had superior returns in the past. More investment leads to an increase in the total money managed by a hedge fund as well as hiring more professionals and administrative staff to manage and keep track of the new money. In this causal loop framework, both "Hiring" and "Total money in hedge fund" lead to an increase of the "Size" of a hedge fund. It should be noted that in a simulation model and for testing purposes, size will be broken into two components: size in terms of total money in a fund (Money size) and size associated with the number of employees in a hedge fund (Organizational size). However, as mentioned in the introduction, differing the definition of a size of a hedge fund at the conceptualization level is not needed. Both definitions of a size of a hedge fund are positively correlated. When talking about organizational effects, organizational size proxy is used. When talking about finance and economics effects, money size proxy is used.

In conclusion, the balancing loop N1 provides a negative feedback mechanism between a size and performance of a fund. Greater an organizational size of a hedge fund induces an increase in structural differentiation, leading to an increase in bureaucracy that

decreases a hedge fund's ability to get more leverage in a market, thus reducing its performance.

Loop N2

Traditional research on risk-taking focused on individual decision-makers. This research is usually largely independent of context. However, Tetlock (1985) and Ungson and Braunstein (1982) emphasized that contextual effects are important when studying risk-raking. According to March and Simon (1958, p. 139): "The organizational and social environment in which the decision maker finds himself determines what consequences he will anticipate, what ones he will not; what alternatives he will consider, what ones he will ignore. In a theory of organization these variables cannot be treated as unexplained independent factors, but must themselves be determined and predicted by the theory." Many sociologists concentrated on the definition of "acceptable risk" perceived by various groups in society and by individuals in different types of organizations (Douglas and Wildavsky, 1984; Johnson and Covello, 1987). According to Ouchi (1979), the organization's control strategies, whether bureaucratic, market or clan, would also affect risk-taking. Bureaucratic control, which is high on formalization, centralization and standardization (Pugh et al. 1969) is a method of "uncertainty avoidance" and is therefore likely to result in lower risk taking. Zaheer (1992, p. 41, p. 184) provided empirical evidence for this assertion in his thesis. The result was also supported by other empirical findings that have shown that bureaucratic organization often produces dysfunctional behavior and inefficiency (Merton, 1940; Gouldner, 1954; Meyer, 1990).

According to the literature review, the causal link between "Bureaucracy" and "Risk taking" is negative as depicted in the model. The ability to obtain leverage from a market is not only a function of bureaucracy and experience in the industry. If a manager is constrained to make bets in the market due to a reduced ability in risk taking, the hedge fund's ability to get more leverage is decreased. Therefore, a performance of a fund goes down. A well known risk-return relation indicates that smaller the risk, smaller a return (performance) (Bodie, Kane, and Marcus, 1999, p. 178). In conclusion, a greater size of a fund leads to more bureaucracy that induces the decrease in risk-taking, thus reducing the overall performance of a fund. The negative N2 loop describes such a feedback mechanism.

Loop N3

As presented by Sastry (1997), inertia represents strength of relationships with buyers, suppliers, and financial backers. When an organization is first formed, the level of inertia is necessarily low (Sastry, 1997). Tushman and Romanelli argue that organizations build inertia (both socially anchored and structural) over time. Therefore, it is safe to assume that organizational size positively affects inertia. As an organization develops, its ability to change decreases. Ability to change is inversely related to inertia (Sastry, 1997). Therefore, an increase in an organizational size leads to an increase in inertia; that causes the ability to change to decrease. The model depicts these two links: a causal link from "Size" to "Inertia" is positive, and a link from "Inertia" to "Ability to change" is negative.

A new causal link between "Ability to change" and "Ability to get more leverage" is added. The polarity of the link is positive. Generally, the ability to get more leverage in a market is a function of being able to quickly react to different market imperfections. Market imperfections are often different from each other and occur at random times. Hedge fund managers have to be able to employ different techniques in a short amount of time in order to outperform other managers. In order to do that, the employees of the fund have to be able to change their strategies with every change in the market. Of course, this ability is also largely a function of a skill of a manager. However, that relationship was already described in loop P1. Thus, an increase in an organizational size leads to an increase in inertia followed by the decrease in the ability to change. Therefore, the performance of a hedge fund decreases as indicated by a negative loop N3.

Loop N4

Besides organizational factors that lead to the relationship between a hedge fund's size and performance, different economics/finance factors are in place. Two of them are introduced and analyzed in the paper. It is important to note that in these two relationships size is referred as "money size" or the total amount invested in a hedge fund. The first factor is a positive relationship between a size of a hedge fund and the risk of imitation by other managers and brokers. The relationship is well described by Lavino (2000) and Strachman (2000). In the example of the Long Term Capital Management (LTCM) hedge fund, due to a strongly positive performance of the fund, many brokers and other fund managers imitated the LTCM by buying and selling exactly the same positions as LTCM did. As a result, LTCM reduced its ability to leverage in the

marketplace. As soon as other managers replicated LTCM's strategy, ability to get any leverage from the market vanished. Therefore, the size cripples the returns of hedge funds, and in case of LTCM, led to its collapse and a disaster in world markets. That relationship is described by a negative feedback loop N4.

Loop N5

The second finance/economics factor that leads to a negative relationship between a fund's size and performance is the "Size of a bet." "Size of a bet" variable describes the amount of a trading volume performed by a hedge fund relative to the market volume. For bigger funds, these bets are usually higher and they represent a bigger percentage of the market volume. As was introduced earlier, hedge funds try to find market inefficiencies and make profits from this arbitrage by acting very quickly. However, some inefficiencies can only handle small bets. Even if the large bet is divided into small bets, it is hard to find so many inefficiencies in order to accommodate all bets. Therefore, the size of a bet is negatively related with the ability to get more leverage by managers of a hedge fund. Thus, ability to outperform other funds decreases. The negative loop N5 is a feedback loop that relates a hedge fund's size with performance.

POSSIBLE DATA LIMITATIONS

As have been shown, most of links in the theoretical framework of the model were thoroughly researched in both organizational and finance fields. The combination

of the links into feedback mechanisms and the interlinking of the loops make the model unique. The process of the growth of a hedge fund and the impact of the size on its performance is analyzed through the feedback mechanisms introduced in the model. As mentioned before, small hedge funds seem to be more effective than large ones (The Economist, December 2nd, 2000). However, more studies should be done on correlation of the size and performance of hedge funds. Several links were assumed in the model; however, it might be possible that some data find positive, negative or zero correlations between some variables. For example, it was postulated that an increase in the ability to change leads to an increase in the ability to get more leverage out of the market by a hedge fund. However, it is possible that during turbulent market movements, more conservative hedge funds do better than more momentum oriented funds. Therefore, the data will disconfirm the hypothesis that the "Ability to change" and "Ability to get more leverage" and "Performance" are positively related.

Also, it was proposed that an increased risk taking capabilities lead to an increase in the ability to get more leverage and thus more return. However, it is possible to find several case studies that disprove this assertion. In these case studies an increase in a risk-taking appetite actually leads to poor decision making; thus, reducing a performance of a fund.

CONCLUSION

A theory-based feedback model was developed to study the process of growth of a hedge fund and the impact of its size on performance. It was proposed that market environment, organizational structure of a hedge fund, behavior of investors and

managers, and reaction of the market are factors in the main finding that small hedge funds are generally more efficient and perform better than large hedge funds in the short and long terms. The result draws support from organizational studies literature as well as some results from finance and economics.

BIBLIOGRAPHY

1. Blau, P. M. 1970. A Formal Theory of Differentiation in Organizations. American Sociological Review, Vol. 35, pp. 201-218.
2. Bodie, Zvi, Kane, Alex, and Marcus, Alan. Investments, 4th edition Irwin/McGraw-Hill, Boston, MA, 1999.
3. Douglas, M. and Wildavsky, A. Risk and Culture, Berkeley, CA: California University Press, 1984.
4. The Economist, December 2nd, 2000.
5. Gouldner, A. W. Patterns of Industrial Bureaucracy, Glencoe, Ill: Free Press, 1954.
6. Johnson, B. B and Covello, V. T, The Social and Cultural Construction of Risk, Dordrecht: D. Reidel, 1987.
7. Lavino, Stefano. The Hedge Fund Handbook. McGraw-Hill, New York, NY, 2000.
8. March, J. G. and Simon, H. A. Organizations, New York: Wiley. 1958.
9. Merton, Robert C. On the Cost of Deposit Insurance When There are Surveillance Costs, Journal of Business, 51 (3) (1978), pp. 439-452.

10. Meyer, Marshall W. The Growth of Public and Private Bureaucracies, in S. Zukin and P. DiMaggio (eds.) Structures of Capital: The Social Organization of the Economy. Cambridge: Cambridge University Press, 1990.
11. Ouchi, W. G. A Conceptual Framework of the Design of Organizational Control Mechanisms, Management Science, 25 (9) (1979), pp. 833-849.
12. Pugh, D., Hickson, D. J. and Hinings, C. R. The Context of Organization Structures, Administrative Science Quarterly, Vol. 14 (1969), pp. 91-114.
13. Sastry, M. Anjali. Problems and Paradoxes in a Model of Punctuated Organizational Change, Administrative Science Quarterly, Vol. 42 (1997), pp. 237-275.
14. Scott, W. R. Organizational Structure, Annual Review of Sociology, Vol. 1 (1975), pp. 1-20.
15. Scott, W. R. Organizations: Rational, Natural, and Open Systems. Chs. 9 and 10, Sources of Structural Complexity, Englewood Cliffs, NJ: Prentice-Hall, 1997 pp. 226-283.
16. Simpson, R. L. Theories of Social Exchange. In J. Thibaut, J. Spence & R. Carson (eds), Contemporary Topics in Social Psychology. Morristown, NJ: General Learning Press, 1976, pp. 79-97.
17. Strachman, Daniel A. Getting Started in Hedge Funds. John Wiley & Sons, New York, NY, 2000.
18. Tetlock, P.E. Accountability: The Neglected Social Context of Judgement and Choice, Research in Organizational Behavior, Vol. 7 (1985), pp. 297-332.

19. Ungson, G. R. and Braunstein, D. N. (eds.) Decision Making: An Interdisciplinary Enquiry, Boston, MA: Kent Publishing Company, 1982.

20. Weick, Karl E. The Social Psychology of Organizing, 2nd edition (1979), New York, Random House

21. Worthy, James C. Organizational Structure and Employee Morale. American Sociological Review, Vol. 15, No. 2, Apr., 1950, pp. 169-179.

22. Zaheer, Srilata A. Organizational Context and Risk-Taking in a Global Environment: A Study of Foreign-Exchange Trading Rooms in the U.S. and Japan, MIT Sloan School of Management PhD thesis (1992).