STANDARD & POOR'S

Greenwich Roundtable Quarterly

Regulation of Hedge Funds | Health Care | Global Macro | U.S. Stock Market

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Introduction

Inside this edition of the Greenwich Roundtable Quarterly we begin to shift our focus away from fear, uncertainty, and defensive strategies. You will be treated to a collection of readings on global macro, equity, and health care strategies. After four years of foul weather for the stock and bond markets it is clear that we need to find new sources of inefficient pricing. Venture capital, private equity, and hedge funds have experienced disappointing returns. Hedge funds have seen their previously predictable return streams dry up. The alternative investment community is becoming more traditional. The search for certainty is being replaced by the search for returns. Stocks are becoming less influenced by fundamentals and more driven by macro economic forces and are becoming more inter-correlated. The foreign exchange, commodity, and global bond markets offer more interesting sets of opportunities. As we search for practitioners who think outside the box you are treated to two contrasting views in the global macro discussion. With an aging population and health care viewed as an entitlement, investing in the life sciences seems to be one of the few recession-proof strategies available. However, health care returns have been spotty.

If only the scientists could apply their genius to making money. Craig Venter offers an exciting look at the mapping of the fruit fly genome, many months before he went on to map the human genome. As truthful as he is brilliant, he cautions that commercial applications of his discovery might not be profitable for another half century. Rob Langer is an MIT professor who many consider to be the Thomas Edison of biotechnology for his prolific record of discovery. More importantly, he and Terry McGuire explain the highly profitable interrelationship between early stage investing and academic discovery.

Typically our focus at The Greenwich Roundtable is on investments and wealth creation. We leave lobbying and noninvestment issues to those better qualified. But in August 2004, the Securities and Exchange Commission (SEC) asked us to comment on their proposed rule to regulate the hedge fund industry. [The Roundtable's response letter of September 15, 2004, can be found at www.greenwichroundtable.org, in the *Winter 2005 Newsletter*.] We held our own version of Senate hearings. (Okay, so we held two meetings in Greenwich.) The discussions were eye-openers. Cindy Fornelli, arguing for the SEC, states that mere registration is a gentle requirement, would not be invasive, and would instill a compliance consciousness where none existed before. Adam Cooper, speaking for the Managed Funds Association, warns of the legislative slippery slope, added unproductive costs, and the chill on creativity that would occur after hedge funds are compelled to register. Sapna Delacourt offers the perspective of the U.S. House Financial Services Committee as their Counsel. On October 16, two SEC commissioners offered an unusual dissent of the staff proposal. The rule was adopted in a narrow 3-2 vote. We invited the dissenting commissioner, Paul Atkins to Greenwich and he eloquently urged that good government shouldn't shoot first and ask questions later. Connecticut's attorney general, Dick Blumenthal, and Brian Borders, author of the National Venture Capital Association's opinion argue both for and against the rule. The discussion was stimulating and serious.

Be on the lookout for upcoming monographs published by the Research Council of the Greenwich Roundtable. The Research Council is a newly formed group interested in promoting and disseminating deeper analysis on hedge fund investor issues. The work and insights of the Education Committee, Standard & Poor's, and high integrity investment managers is intended to demystify alternative investment strategies.

Standard & Poor's has generously underwritten this journal and sends it to you with their compliments. Please join me in expressing our sincere gratitude to this wonderful organization.

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Issues & Outlook on the Proposed Regulation of Hedge Funds

Cynthia M. Fornelli, Deputy Director
U.S. Securities and Exchange Commission

August 19, 2004

The best way to begin to describe the proposed rule from the Commission[1] that would require investment advisers to hedge funds to register with us as investment advisers is to walk through the SEC's goals — why and how we came to where we are. I want to give you the history as to why we think it's important that hedge fund advisers register with the SEC.

Two years ago, former Chairman Harvey Pitt, concerned about the rapid growth, began a study of the industry. There is no accurate data on hedge funds.

In 2002, the SEC, under the leadership of then-Chairman Harvey Pitt, began an investigation and a review and study of hedge funds. What prompted the Commission to do that was the concern that the industry was growing very, very rapidly. When we began our study, the best estimate as to the size of the industry was that there were approximately 7,000-8,000 hedge funds with $650 billion under their management. In the two years since we started our study, that figure has grown quite a bit and now there are estimates that the industry is at almost a trillion dollars.

I keep using the word "estimate" because one of the concerns we have at the SEC is that the industry is very large and growing, but we don't know — nor does anybody know — how large the industry is. There are no good data; there are no good figures as to the size of the industry, and as regulators that concerns us.

Chairman Pitt was concerned with an increase in fraud. We found that fraud was increasing but not disproportionately so.

The other thing that prompted us to look at hedge funds and to commence our study was the increase we had seen in the number of investigations from our enforcement staff and our examination staff with respect to hedge fund fraud. It's often said that hedge funds are unregulated entities. That's not entirely true. The SEC does currently have anti-fraud jurisdiction over hedge funds, but that means we can't commence an investigation until fraud has already occurred — until, as [current SEC] Chairman William Donaldson likes to say — the blood is already on the floor. So the increase of fraud concerns us as well.

I will point out that after the staff did its study, we didn't see a disproportionate number of fraud cases in hedge funds, but it's a number that's rising — enough to validate our concerns.

Editor's Note: The author wishes to make clear that the views expressed in this essay are her personal views and are not necessarily those of the SEC or any member of the SEC.

1. See www.sec.gov.

We were concerned with 'retailization.' We found that the less sophisticated 'retail' investor was investing in hedge funds through their pension funds.

The specter of an SEC investigation creates a climate of compliance and more accurate valuations.

And the third concern we had was the feeling that there was a retailization occurring in the hedge fund industry. That is, less sophisticated, less wealthy individuals were having more and more access to hedge funds. Our initial thought was perhaps it was because the accredited investor standard had not changed for the past 25 years, so it had not kept pace with inflation; that the $200,000 annual salary requirement for an accredited investor in place in the early 1980s was not nearly the same proportionately to today's dollars.[2]

However, we did not find too much retailization occurring with accredited investors investing directly in hedge funds after we had commenced our study. Instead, we found another type of retailization. An increasing number of pension plans, endowments, and private pension plans were investing heavily in hedge funds. Therefore, less sophisticated, less wealthy individuals were more and more exposed to hedge funds in an indirect way. In many instances, they were unaware their pension plans were investing heavily in hedge funds.

These issues are what prompted the SEC to commence its investigation. The staff went out and visited 65 hedge fund advisers, registered and unregistered, and gathered quite a large amount of information.

In May 2003, the staff hosted a two-day roundtable at the SEC and had a number of interested parties participate for the public record, including hedge fund managers, representatives from the Managed Funds Association, lawyers like Paul Roth,[3] accountants, academicians, fellow regulators, representatives from the NASD[4] and the CFTC,[5] and foreign regulators. We at the SEC are very interested to hear what investors have to say so we asked for public comment and people from all over the world gave us their views, either in person or via telecast. After gathering a tremendous amount of information, in September 2003, the staff issued a thorough and exhaustive study on hedge funds.[6] It's a lengthy document, but the executive summary, which is less than 10 pages long, gives a good flavor for what were our concerns, our findings, and our recommendations. In that report, the staff issued a number of recommendations, the most significant being that the Commission propose and pass a rule that would require hedge fund advisers to register with the Commission as investment advisers under the Investment Advisers Act of 1940.

In July 2004, the Commission did just that and proposed such a rule, with a two-month time frame for public comment. The staff will review those comments and make a recommendation to the Commission for final approval.

I want to stress that this is a really important initiative and it is designed to protect investors, not just wealthy investors who many people will say do not need the SEC's protection. I would quibble with that. I would say that all investors need the SEC's protections, but that's not the only investor we are trying to protect. We are trying to protect the pensioner, the San Antonio fireman who may not know his pension plan is investing in hedge funds. We are also trying to protect those investors who are on the other side of hedge fund transactions, and I would be remiss if I did not mention

2. See www.sec.gov/answers/accred.htm.

3. Partner at Schulte Roth & Zabel LLP.

4. NASD, the National Association of Securities Dealers, is the largest self-regulatory organization for the securities industry in the U.S. Under federal law, every securities firm doing business with the U.S. public is a member of the NASD.

5. CFTC, the Commodity Futures Trading Commission, protects market users and the public from fraud, manipulation, and abusive practices related to the sale of commodity and financial futures and options, and to foster open, competitive, and financially sound futures and option markets.

6. See www.sec.gov/news/studies/hedgefunds0903.pdf.

the scandals that occurred in September 2003 involving mutual funds and hedge funds.

We regulate mutual funds; we have embarked on a very heavy regulatory regime and oversight regime for mutual funds, but we still do not have the hedge fund piece. The proposal to require hedge fund advisers to register with us is a very modest proposal. It would in no way impede upon a hedge fund's ability to be creative, to invest in the types of strategies that hedge funds are known for and that make them attractive to investors.

Obviously it is one of the concerns the SEC has — that it is a growing part of our market. Right now it's estimated to be a trillion dollars. But we're also concerned about the impact because of the rapid trading; because of the effects of leverage, it has a greater impact on the market than even those one trillion dollars. And that is why we want to take this modest step of having hedge fund advisers register with us.

I want to try to alleviate people's concerns about the slippery slope idea; that this is a first step and there might be more to come later. Under the Investment Advisers Act, the SEC does not have the authority to go further. The Advisers Act is a disclosure and anti-fraud statute that emphasizes the importance of transparency. Investors have the ability to receive full information about their investments so they can make a decision about their investment vehicles. Under the Advisers Act, we could not limit hedge funds' investment strategies.

Congress has not given us authority to go beyond disclosure. There is no 'slippery slope.'

The SEC appreciates that hedge funds are an attractive and important investment vehicle for investors; they do provide liquidity to the market; they do play an important role. Nothing on our regulatory plate would in any way impede a hedge fund's ability to invest the way that they want to invest for them to provide liquidity, for them to help raise capital. This message gets lost. We do not think that hedge funds are bad; we think hedge funds are good for the market and for investors and we don't want to impede investors' access to hedge funds. And I might add that perhaps the SEC is getting it right. Perhaps we do know what we're doing.

The registration of hedge fund advisers will not change advertising restrictions, but in the report that the staff put out in September 2003, another one of the recommendations was that the Commission consider easing the advertising restrictions. Paul Roth and I talked about how there is an unlevel playing field right now, because certain hedge funds find ways to advertise themselves, while those complying with the law do not. If all hedge fund advisers are registered, we will be able to identify those that are illegally advertising, which will aid in our examination of hedge funds. But the staff has also recommended the Commission consider easing some of those restrictions to make it a more level playing field.

Under the Advisers Act, investment advisers are allowed to charge performance fees and that would not be impeded by registration in any way. Investment companies can actually charge performance fees, but they have to be fulcrum fees and it's a very com-

plicated formula. As a result, most of them don't avail themselves of the possibility. But again, we appreciate that one of the abilities for hedge fund managers to be able to take the risks that can lead to high rewards is in the performance fee incentive. It is something we're concerned about with respect to potential conflicts of interest. The SEC adopted a rule that would require better disclosure with respect to those entities or those managers who manage both a hedge fund and a mutual fund. We did that as an alternative to the Baker Bill proposal or some of the other ideas that were floated around on Capitol Hill, which would prohibit the dual running of both a mutual fund and a hedge fund.

I think it's somewhat of an unfair characterization that even with registration, the SEC couldn't catch the late trading and market timing abuses in the mutual fund industry. The abuses involved fraudulent activity where people were apt to lie, cheat, and steal. We cannot find every instance of lying, cheating, and stealing just as police departments can't find every murderer out there, but that doesn't mean they don't have laws that prohibit and prevent murder.

Having said that, the SEC is keenly aware of the fact that fraud occurred. Chairman Donaldson has implemented an aggressive risk management function at the SEC. He's brought on a new risk manager and created a new office of risk management that will help us identify problems proactively rather than reactively.

We are now rethinking how we go about monitoring our registrants. We've just brought on a new chief technology officer who will help us modernize how we survey all the industries and registrants. It will help us identify emerging trends, potential problems, and allocate our resources better. How are we going to bring on 2,000 or 3,000 new registrants with our limited resources? Congress has been very generous in giving us an increased budget, but we could never keep up unless we rethink our monitoring.

Under the Antifraud Provisions of the Investment Advisers Act, hedge fund advisers already are required to mark their books in a certain way. You have already slipped down that slope, if that's how you prefer to view it. SEC regulations will force people to better mark their books, and maybe eliminate self-marking of books. The mere specter of an SEC examination creates a culture of compliance at hedge funds and at any registered entity. We've already seen an increase in advisers voluntarily registering with us. We estimate that 40%-50% of all U.S. hedge fund advisers already voluntarily register with us. They're deciding that registration is not the burden that some would have you believe. I don't have the statistics on those that are registered with the Financial Services Authority (FSA) in the U.K., but we do meet regularly, both formally and informally, with the FSA to coordinate our efforts. It is somewhat of a different regulatory regime, but I met with FSA Director of Regulatory Strategy and Risk, Dan Waters, and we discussed hedge funds.

To expand our focus to include investors in hedge funds is an important point. It's something both the Hill and the SEC have spent a lot of time on. One of the testifiers

for the Senate Banking Committee, Mark Anson from CalPERS, made the point that it would be good to have investment adviser registration because it will contain the type of information that investors want. Perhaps you don't care what Mark Anson thinks. But as the largest pension plan in the country, we at the SEC do.

What is it about investment adviser registration that causes concern? We hear that it is the arbitrary limit. Of 8,000 hedge funds, 10% control 75% of the assets. It is the new gold rush going forward. Setting an arbitrary limit of $25 million as the regulation limit will purportedly create a risk, not in the large hedge funds, which will be forced to register, and which will have the resources for compliance. The real risk will be in the small, unregulated hedge funds, the private partnerships that are below $25 million. Regulation, particularly for the smaller hedge fund, is seen as a deterrent in their ability to grow and become what we want them to become.

Actually, the $25 million standard that people are talking about is not an SEC imposition — that is actually a Congressional imposition from 1996. That is not something the SEC can change. When the SEC initiated our study two years ago, we expected that raising the accredited investor standard would be the primary recommendation. However, what we found was there weren't many people making $199,000 a year anxious to invest in a hedge fund. In fact, the hedge funds themselves told us at our roundtable that they don't like the "just barely" accredited investors in their funds; they're difficult and not really worth the effort. So the SEC did not end up being so concerned about the retail investor. Instead, we worried about the pensioner, the fireman in San Antonio whose pension plan is invested in the hedge fund and may not even know it and understand it.

We looked into the concerns that hedge funds would move offshore if we required registration, and our data has not indicated that this would be the case. There's just too much money, I think, in the U.S. Also, the registration process is not that burdensome. Hedge fund advisers must comply with the requirements of the Advisers Act because they're rooted in the antifraud provisions, which already apply. Only the reporting requirements would be new under the registration regime. Many offshore havens already have registration requirements. The U.S. is one of the few jurisdictions without registration requirements.

The SEC has been vocal in asking for comments on this issue. We want to hear from all sides, even on an informal basis. If you don't want to officially go on the record or go through the process of writing a formal comment letter that has to be vetted in your organization, pick up the phone and give us a call. Let us know what you think and what your concerns are. You can come meet with us if you'd like or we can have a phone chat or an email. We do want to hear from you.

The Commission is revamping how we go about our examinations. We want to be more proactive, have more targeted examinations, and improve our surveillance. We are putting new technology into place and doing our examinations in a new way so that we can pinpoint important data faster, then use our resources to go in and

examine in that area. So you can expect an increased level of scrutiny as a mutual fund, as a broker/dealer, or as a registered investment adviser. ■

Ms. Fornelli is currently senior vice president and compliance executive for securities regulation and conflicts management at Bank of America. Formerly she was deputy director to the director of the division of investment management of the U.S. Securities and Exchange Commission. Prior to joining the SEC, Ms. Fornelli spent several years in private practice, first as an associate in the Washington, D.C., office of Fried, Frank, Harris, Shriver & Jacobson, and then, as a member of the Investment Management Practice Group of Dechert Price & Rhoads in Washington, D.C. She has significant experience in investment adviser, investment company, and broker-dealer matters and has written extensively on personal investing practices and procedures and other compliance issues for the investment management industry.

Ms. Fornelli is a graduate of Purdue University (BA, 1985) and George Washington University National Law Center (JD, magna cum laude, 1990). She is admitted to practice law in the District of Columbia.

Issues & Outlook on the Proposed Regulation of Hedge Funds

Sapna Delacourt, Counsel, U.S. House of Representatives Committee on Financial Services

August 19, 2004

Transparency is the foundation of our capital markets. Hedge funds are an important part of the markets. We are concerned that the SEC proposal may damage or impair hedge funds' role.

We are concerned about whether the SEC is capable of fully monitoring this industry through registration. The SEC did not detect and could not prevent problems in the mutual fund industry. Why will they do a better job with hedge funds?

The House Committee on Financial Services is under the leadership of my boss, Chairman Michael G. Oxley (R-OH), and Representative Christopher Shays (R-CT). At the Committee, we believe that the hallmark of the federal securities laws[1] is full and fair disclosure of information. Armed with these facts, investors should be free to select their investments based on their goals, their age, their risk tolerance, and other factors.

We view transparency as the foundation for a robust and competitive free market. We view hedge funds as an important part of the market. However, through the SEC proposal, their livelihood may be damaged or impaired by some of the ideas in the SEC's rule proposal.

The Committee on Financial Services has been very active in making available to investors the information they need to make informed decisions about their investments. We have done so through the Sarbanes-Oxley Act[2] and through H.R. 2420, a bill that passed the House of Representatives in November 2003 that dealt with transparency of mutual fund fees.

A review of the hedge fund industry is probably inevitable in our Committee, although since May 2003, we have not had any hearings on this topic and will probably not do so for the remainder of 2004. I would anticipate that sometime in 2005, following the SEC's decision on the rule proposal, we will be reviewing the impact on hedge funds.

Like the Senate, we share concerns about whether the SEC is capable of fully monitoring this industry by requiring registration. There are two main issues. First, will registration lead to more regulation? Is registration part of a slippery slope that will cause boards of hedge funds to be monitored by the SEC?

Second, if the SEC adopts the rule as proposed and hedge funds are required to register, are we at that point ceding authority to an agency that's had a lot of trouble identifying problems in the mutual fund industry? Mutual funds are required to

Editor's Note: The author wishes to make clear that the views expressed in this essay are her personal views and are not necessarily those of the U.S. House of Representatives or any member of the Financial Services Committee.

1. The federal securities laws were enacted in the wake of the 1929 stock market crash. They provide full and fair disclosure to investors and created the SEC to implement this disclosure.
2. The Sarbanes-Oxley Act is designed to protect shareholders against accounting fraud and was passed, in part, as a reaction to the Enron and WorldCom financial scandals. The Act states that all business records, including electronic records and electronic messages, must be saved for "not less than five years."

Will registration cause false comfort among investors?

register, but without tips from the inside, the SEC has not been able to anticipate problems. They have a broad scope of initiatives under their domain, incorporating the provisions of the Sarbanes-Oxley Act and incorporating initiatives that have come forward since the mutual fund scandals. Is that enough? Is that where they should focus their resources? Or should they enter this domain of hedge fund regulation, beginning with registration?

With that as the backdrop of our concerns, we are sympathetic to the concerns of influential people like Chairman Greenspan, who believes registration will cause the liquidity in this market to disappear. SEC registration could just become an added cost of doing business, or it could lead to more bureaucracy associated with hedge funds, or it could cause false comfort among investors who are exposed to hedge funds.

Those are some of the concerns the Committee is grappling with and will have to examine more closely. We are, of course, sympathetic to what the SEC is trying to do and are interested in seeing how this rule develops and whether any modifications are made. It's very important we hear from investors. We don't hear a lot from hedge funds, either individually or as a coalition; if we did, we could better understand how the SEC's rule would impact their businesses.

Unlike mutual funds, we do not hear from hedge fund participants. Our committee wants to hear your concerns.

Because hedge funds are not mobilizing themselves and coming up to Capital Hill and demonstrating their importance in the marketplace to policymakers and regulators among members of Congress — especially the members on the Financial Services Committee — I fear that their knowledge of the hedge fund industry is based on headlines in the news. What happened at Canary Capital[3] is seen as the embodiment of an ethically challenged hedge fund industry rather than an exception.

On the House side of Capitol Hill, while we are for full disclosure and transparency of fees, at this point we are interested in letting hedge funds operate in the marketplace without our interference. We are taking a back seat to the SEC until we feel we need to step in and do something that will either help the hedge funds operate more efficiently in the marketplace or will assist investors. For example, if there were an exodus of hedge funds going off-shore because it avoided some reporting requirements and was just more efficient to do so, then we might want to address that. If there were an environment that wasn't friendly to hedge funds, we would step in to fully support a competitive marketplace. In the meantime, we're taking a wait-and-see attitude — seeing how things play out. ■

3. In September 2003, Canary Capital Partners LLC settled for $40 million a case with the State of New York for prohibited "market timing" and "late trading" tactics to game certain mutual funds. The ensuing scandal implicated a number of well-known mutual fund firms.

Sapna Delacourt is counsel to the Committee on Financial Services, U.S. House of Representatives in Washington, D.C. Ms. Delacourt develops legislative and policy proposals and advises Chairman Michael G. Oxley on securities issues.

Prior to serving Chairman Oxley, Ms. Delacourt was legislative counsel to Congressman John B. Shadegg where she formulated and advanced Congressman Shadegg's policy initiatives in financial services, tax and budget, and judiciary issues. Ms. Delacourt is also an adjunct professor in the legal research and writing department at the Georgetown University Law Center. Her tenure with Congressman Shadegg followed prior service as an attorney with the law firm of Collier Shannon Scott in Washington, D.C. There Ms. Delacourt specialized in antitrust and consumer protection issues. She counseled and advised clients regarding Federal Trade Commission consumer privacy initiatives, including enforcement of the Children's Online Privacy Protection Act and the Gramm-Leach-Bliley Act.

Ms. Delacourt received a BA in Political Science at the University of Michigan and a JD from the Georgetown University Law Center, where she was managing editor of the Georgetown Journal of Legal Ethics.

Issues & Outlook on the Proposed Regulation of Hedge Funds

Adam C. Cooper, Citadel Investment Group. LLC and Chairman of Managed Funds Association

August 19, 2004

Hedge funds are ethically aligned with investors through the incentive fee structure. Investors, through hedge funds, provide risk capital to illiquid markets, act as a shock absorber in a crisis, and should be compensated for that role.

The hedge fund industry has enjoyed substantial growth in recent years, in large part due to the support of investors. Hedge funds now play a fundamental role in helping major pension funds, insurance companies, endowments, and family offices achieve diversity in their investment portfolios and satisfy their future funding needs.

It's appropriate for all of us, given the growth of the industry, to reexamine how this evolving industry operates to ensure that the regime remains relevant. The MFA believes that many of the issues raised by the SEC and its staff should be addressed and embraces the opportunity to work with the SEC and others on addressing them. It remains the MFA's position, however, that the proposed regulations for hedge fund managers will not work to benefit investors or the global financial markets, and that other, more effective means may be employed to achieve the desired ends. The SEC has proposed three principal public policy concerns as justification for the new requirements.

Imposing a new regulatory regime will not improve the investors' condition or benefit the capital markets.

The first is the growth of the industry. Yes, the industry has grown, but that growth does not represent a major crisis or structural flaw. It is not an appropriate basis on which to reexamine an industry. We believe that robust market growth does not, and cannot, serve as the basis of a regulatory regime. The growth of the last decade is a measure of the hedge fund industry's success. It is attributable in large measure to the foresight and efforts of Congress, throughout many years, of enacting a number of important securities reforms that helped facilitate the development, efficiency, stability, and liquidity of our capital markets — reform such as the passage of section 3(c)(7).[1]

Increased investment in hedge funds is also a direct result of the growing demand from institutional and other sophisticated investors for investment vehicles that deliver true diversity and help them meet their future funding needs.

The second basis is the potential for fraud. The SEC's proposal states industry growth has been "accompanied by a substantial and troubling growth in the

Editor's Note: The author wishes to make clear that the views expressed in this essay are in his capacity as Chairman of Managed Funds Association (MFA), the trade association representing the global hedge fund and alternative investment industry in Washington, D.C.

1. A portion of the Investment Company Act of 1940 that permits the exclusion of investment companies from standard registration requirements with the SEC if all U.S. investors are considered to be "qualified purchasers" or "accredited investors."

Rapid growth of the industry does not represent structural flaws. Rapid growth is a result of investors' growing demand to meet future funding needs.

How can the SEC be concerned with fraud when its own staff report found no disproportionate incidence of fraud?

number of its hedge fund fraud enforcement cases." Well, it's difficult to square this assertion with the SEC's earlier staff report on the industry, which found that there was "no evidence indicating that hedge funds or their advisors engaged disproportionately in fraudulent activity" and further that "there was no disproportionately greater basis of fraud experienced among unregistered advisors as there was among registered advisors." In fact, the number of enforcement cases brought by the SEC against hedge funds in the last five years is relatively small, amounting to less than 2% of the total cases.

As SEC Commissioners Cynthia Glassman and Paul Atkins pointed out in their dissent, even if we assumed that the number of fraud cases was rising disproportionately, the new regulatory regime by the SEC would not address the types of fraud that were observed. The large majority of cases cited by the SEC involved managers that were either too small to be captured by the rules proposed, or they were already registered.

That said, the MFA shares the SEC's contempt for fraud in the money management industry or any industry, for that matter, and we support efforts of the SEC and other regulators and law enforcement authorities to investigate and prosecute fully. The MFA, however, believes that the SEC should seek to maximize its enforcement resources through better coordination and consultation with other government and regulatory authorities and supports the proposals by Commissioners Atkins and Glassman that the SEC revisit its oversight methods, rather than looking for more entities to inspect.

The corollary question is, when you look at the risk of redundant regulation, what chilling effect does that have on innovation? What cost does that impose on the industry? If 40%-50% of hedge fund managers are registered with the SEC, probably an aggregate 65% are registered in combination with the SEC and/or the CFTC,[2] and a significant portion in Europe are registered with the Financial Services Authority. There's been a common theme in many recent industry events about better international coordination. I think there also needs to be better national coordination or else the potential exists for redundant regulations.

The third concern is that small investors, pensioners, and other market participants now have greater exposure to hedge funds. In particular, the SEC's release cites the growth in registered funds of funds, the growth in pension fund investment in hedge funds, and the expectation that U.S. hedge funds may seek to market to smaller investors, much as many in Europe have done. The MFA believes these so-called retailization concerns, however, do not have merit and will not be effectively addressed by the proposed regulations. As for hedge funds of funds, if they were to be offered to retail investors these funds and their managers are required to be registered with the SEC. Consequently, these funds are subject to the full panoply of protections afforded by the SEC registration process, and in going through the process there's adequate opportunity to impose certain conditions and other limits on the offerings.

2. The mission of the Commodity Futures Trading Commission (CFTC) is to protect market users and the public from fraud, manipulation, and abusive practices related to the sale of commodity and financial futures and options, and to foster open, competitive, and financially sound futures and option markets. See www.cftc.gov.

As for pension plans, the MFA observes that their investments in hedge funds remain relatively small relative to their total assets. In 2003, U.S., European, and Canadian pension funds all reported that about 1% of portfolio assets were invested in hedge funds. In addition, these investors are represented by professional money managers who act as fiduciaries to the plan and are subject to comprehensive regulation under pension statutes and regulations. Let me just note that's in comparison to what's been reported as roughly 3% of pension assets invested each in private equity and venture capital.

Pension funds already have professional fiduciaries that are subject to comprehensive pension regulations.

If the SEC is concerned by an increased number of investors qualifying to invest in certain hedge funds under the so-called accredited investor standards, the MFA has recommended at least doubling these standards — bringing them more current. It's been many, many years since these standards have been adopted.

Having addressed the SEC's concerns, I realize I have not addressed the question on everybody's mind: What's the industry's concern? What's the big deal? More importantly, what does all this mean for investors?

It's clear that this industry has prospered under the existing legal framework. The MFA believes the success of the industry testifies to the fact that the current regulatory regime works just fine. Within the current environment hedge fund managers are subject to a wide variety of direct and indirect regulation, whether or not they're registered. In addition, many are already registered in one capacity or another — either with the SEC or the CFTC or both.

The statutory and regulatory structure currently in place is consistent with governance of other institutional marketplaces, such as marketplaces for private placements, private equity, venture capital, and over-the-counter derivatives. There's ample precedent that has worked effectively for years. There's a long-standing recognition by Congress and U.S. regulators that government resources should be devoted to protecting investors who require protection, rather than those who can look out for themselves.

It's our belief, therefore, that any material change to the regulatory framework deserves careful consideration and careful scrutiny in order to ensure the benefits outweigh the burdens that would be imposed.

The SEC proposal will create business uncertainty for the hedge fund industry. It will undermine and inhibit the industry's willingness to engage in innovative strategies for fear that our intentions will be misunderstood or second guessed.

The key issue with the registration proposal is this: the SEC is proposing to reverse course with respect to a regulatory framework that has served the industry and its investors well for many years. In doing so, the SEC's proposal raises the specter of potential future restrictions applicable to hedge fund managers. This creates business uncertainty for the hedge fund industry, and it is this uncertainty that has the potential to do the most harm. Investors know full well the importance of investing in a stable and certain administration — whether it's an emerging market or a hedge fund investor.

In response to this concern, Chairman Donaldson and the SEC staff say this proposal is a modest first step. However, as Commissioners Atkins and Glassman point out in their dissent, this begs the question of what this is a first step toward. Indeed, it's the potential for future, more substantive regulation that is likely to bring the greatest cost.

Chairman Greenspan shares this concern. As he said earlier this year, "I grant you that registering as an investment advisor, in and of itself, is not a problem. The question is, what is the purpose unless you're going to go further, and therefore I feel uncomfortable about that issue."

It's the unquantifiable costs that should be of greatest concern. The MFA believes that the chilling effect that Chairman Greenspan foresees will cost our system not only in terms of flexibility and liquidity, but also the industry's investors in terms of performance and the risk/return profile they seek from hedge funds.

Specifically, the regulatory regime proposed by the SEC has the potential to undermine and inhibit hedge fund managers' willingness to engage in complex and innovative investment strategies and to continue as they have for years investing in illiquid markets, for fear that their intentions or their objectives would be misunderstood or second-guessed in retrospect. Concern over uncertainty may chill the hedge fund's ability to provide risk capital, both in times of market instability and market dislocation. And that is the fundamental concern we wish to highlight.

We are concerned that rather than reducing systematic risk, the proposed regulations may actually create more inefficient and unstable markets because of the potential unwillingness of hedge funds to act as shock absorbers — an historical role they have played that none other than Chairman Greenspan has recognized repeatedly in the President's working group.

Part of the problem is that our policymakers and legislators are only just beginning to understand the critical role that hedge funds play within the market. They're hesitant to defend that which they don't understand because what if there's a problem some day? There could be a huge crisis in the future and then the press is going to look back and say — who was defending the hedge funds? I think that's a big concern.

In response, the MFA is making great strides in enhancing the positive visibility of an industry that heretofore really has not been very visible. I think the key factor is the incredible liquidity-providing role that hedge funds play. In times of market instability and crisis, hedge funds act as shock absorbers, not constrained by long-only strategies of mutual funds and other more traditional investment strategies. ■

Adam Cooper is Senior Managing Director and General Counsel for Citadel Investment Group, L.L.C. ("Citadel"). He is responsible for overseeing Citadel's global legal, compliance and transaction management functions. Prior to joining Citadel in January of 1999, he was a Partner with the Chicago law firm of Katten Muchin & Zavis (now known as Katten Muchin Zavis Rosenman). During Mr. Cooper's 12 years with KMZ, he represented domestic and international banks, brokerage firms, and money managers, and specialized in global financial services and capital markets issues.

Mr. Cooper was elected Chairman of the Managed Funds Association, the hedge fund industry's trade association, on October 1, 2003, and also serves on its Executive Committee and Board of Directors. He has recently been appointed to the CFTC's Global Markets Advisory Committee and is a member of The Bretton Woods Committee. Mr. Cooper also served as a member of the Global Documentation Steering Committee sponsored by the Federal Reserve Bank of New York and is a frequent speaker on industry matters.

He graduated with distinction and High Honors from The University of Michigan, receiving an AB in Political Science, and from Northwestern University School of Law where he received a JD, cum laude.

Regulating Private Funds: Culture of Compliance or Unintended Consequences?

Paul S. Atkins, Commissioner
U.S. Securities and Exchange Commission

October 28, 2004

I voted against the hedge fund registration rule for three reasons.

My arguments boil down to three points. One is philosophical, one is practical, and the third is a comity, a good-government type of argument.

From a philosophical perspective, we need to have a balance between the public and the private sectors. We estimate that fewer than 200,000 people in the U.S. invest directly in hedge funds. These are investors who can either look out for themselves or hire others to do so. They can ask before they invest money. They can demand to have third-party oversight and audits and reviews similar to what goes on with advisors for mutual funds. No one is forcing them to put money into hedge funds.

There are 200,000 sophisticated investors in hedge funds. There is no retailization.

Many proponents of the hedge fund rule point to a trend toward "retailization," meaning that retail investors are choosing to invest in hedge funds. I should be clear here — our staff report of last year found that there is no significant "retailization." Thus, these concerns are unfounded.

In fact, if retail investors are investing in hedge funds, that is likely occurring in funds of hedge funds. These funds of hedge funds, however, are already registered with the SEC as registered investment companies. Importantly, the advisers of these vehicles are also registered with the SEC.[1] The underlying funds that these funds of funds put their money into may or may not be registered, but, of course, the fund has a diversified portfolio with a registered professional manager making those investment decisions and exercising oversight.

It's true that pension funds and insurance companies and all sorts of other entities are investing in hedge funds. They, of course, are doing this with the advice of professional financial advisers. Compulsory registration of hedge fund advisers will not affect this. In fact, our rule could have the unintended result of more pension funds investing in hedge funds, because all hedge fund advisers will have passed the "SEC test" and be registered with the SEC. Is this what we intended when this rule was adopted — to encourage more pension funds to invest in hedge funds?

1. The SEC Uniform Application for Investment Adviser Registration.

The SEC does not have the resources or the talent to adequately examine the industry.

My practical concern is that the SEC simply does not have the resources to provide the protection that it is promising. If every hedge fund registered with us, there is no way, realistically, we could examine each one. Even with our significantly expanded budget, we will not have the manpower to reach the thousands of new advisers that are now coming under our umbrella. Additionally, our examiners are typically lawyers and accountants, not financial engineers who can understand the often complex transactions of hedge funds. So I worry about where the SEC should allocate its resources. Should we allocate funds to protect the 200,000, well-heeled individuals who invest directly in hedge funds? Or should we focus on the 95 million investors who are invested in mutual funds? Recent headlines suggest there is room for improvement in our mutual fund oversight.

Certainly there are bad things that are going on with hedge funds. Frankly, we typically depend on investors to give us tips. We depend on the market. For example, there was a big fraud uncovered in Boston just last year involving manipulation and valuation chicanery. We found out about it through the market, through investors as well as prime brokers coming to us and saying, "We think things are going bad here." We went in and, sure enough, found the things that were going on and were able to shut it down.

So good spade work, good sleuthing on our part, working with the marketplace and other regulators, I think, is probably the best way to go.

Good government shouldn't shoot first and ask questions later.

The third aspect, which flows into the good government argument, is that we shouldn't shoot first and ask questions later. In a recent meeting, I held up a cartoon from Gary Larson that shows a gunslinger having blown away a guy in the Wild West. The gunslinger starts asking "How long is the Amazon?" and other inane questions. A bystander says, "You fool, you should have asked questions first and then shot!" This is hilarious, but it is also an hilarious, colorful example of what the SEC did with this hedge fund rule.

It's only now that we've passed this rule — after all this discussion — that we are starting to talk about what it means, what we're going to do as far as our examination process is concerned. The SEC has been working toward a more risk-based examination approach. This makes sense, but ultimately, with periodic examinations, there is no way we are going to be able to get the information that people need to deal with systematic risk.

We have two options: adopt the more intrusive banking-style regulatory regime (the banking agencies have a dramatically larger examination staff); or go with a more balanced approach, working with our friends at the Federal Reserve, the Department of the Treasury, the Commodities Futures Trading Commission, and also at the New York Stock Exchange and NASDAQ.

Furthermore, the SEC needs to talk much more with the prime brokers. That was the real problem with regard to Long Term Capital Management (LTCM).[2] It wasn't

2. Long-Term Capital Management (LTCM) was a hedge fund company founded in 1994. Though wildly successful initially, the fund imploded in August and September of 1998. That October, the Federal Reserve Bank of New York intervened and facilitated a private consortium bailout in order to avoid a wider chain reaction of losses in the financial markets. For the full text of the PWG's April 1999 report "Hedge Funds, Leverage, and the Lessons of Long-Term Capital Management," see http://www.treas.gov/press/releases/reports/hedgfund.pdf for a government report on the LTCM collapse.

fraud. It was a disclosure problem. Everybody thought that the folks at LTCM were smart and knew what they were doing. And maybe they did. Had they held on another two weeks, there might have been a totally different type of outcome.

But the problem was that all the banks and other institutions that were lending to LTCM and their counterparties didn't know what everybody else was doing, so the exposure to the Russian market in that particular case was off the charts. That's what caused the Fed and others to be worried about systematic risk there. And that is why the President's Working Group in 1999 — involving the SEC, the Treasury and the Fed — concluded that SEC registration of hedge funds was not the answer to the LTCM situation, but rather more sharing of information between and among regulators and those who have credit exposure to hedge funds.

Registration is an inept solution to an ill-defined problem.

I think what we have to do is not focus so much on the registration aspect. I think we need to focus much more on a cooperative, good-government approach, and that means on the federal and state levels, so that we can make more efficient use of our resources. Thus far, I don't see any real collaboration and cooperation with sister regulators. I worry that we might be talking to our counterparts rather than with them — listening to them and responding to what they have to say.

I will watch with great interest to see how this progresses. ■

Paul S. Atkins was appointed by President George W. Bush to be a commissioner of the Securities and Exchange Commission on July 29, 2002. After serving as a commissioner for more than one year, he was renominated by President Bush on September 3, 2003. He was reconfirmed by the Senate on October 24, 2003.

Commissioner Atkins' 20-year career has focused on the financial services industry and securities regulation. Before his appointment as commissioner, he assisted financial services firms in improving their compliance with SEC regulations and worked with law enforcement agencies to investigate and rectify situations where investors had been harmed. The largest of these investigations involved the Bennett Funding Group, Inc., a $1 billion leasing company that perpetrated the largest "Ponzi" fraud in U.S. history, in which more than 20,000 investors lost much of their investment. Assisting the company's court-appointed bankruptcy trustee, he served as crisis president of Bennett's sole surviving subsidiary. By stabilizing its finances and operations and rebuilding and expanding its business, Mr. Atkins improved its share value for the remaining investors by almost 2000%.

From 1990-94, Mr. Atkins served on the staff of two former chairmen of the SEC, Richard C. Breeden and Arthur Levitt, ultimately as executive assistant and counsellor, respectively. Under Chairman Breeden, he assisted in efforts to improve regulations regarding corporate governance, enhance shareholder communications, strengthen management accountability through proxy reform, and decrease barriers to entry for small businesses and middle market companies to the capital markets.

Under Chairman Levitt, he was responsible for organizing the SEC's individual investor program, including the first investor town hall meetings, an SEC consumer affairs advisory committee, and other investor education efforts, including the original Invest Wisely brochures regarding the fundamentals of the retail brokerage relationship and mutual fund investment.

Mr. Atkins began his career as a lawyer in New York City, focusing on a wide range of corporate transactions for U.S. and foreign clients, including public and private securities offerings and mergers and acquisitions. He was resident for 2½ years in his firm's Paris office and admitted as conseil juridique in France in 1988.

A member of the New York and Florida bars, Mr. Atkins received his JD from Vanderbilt University School of Law in 1983 and was Senior Student Writing Editor of the Vanderbilt Law Review. He received his AB from Wofford College in 1980 and was a member of the Phi Beta Kappa Society.

Regulating Private Funds: Culture of Compliance or Unintended Consequences?

Richard Blumenthal, Connecticut Attorney General

October 28, 2004

I'm an advocate of increased federal intervention. Usually, state authorities in my position, as attorneys general, resist increased federal action.

Hedge funds have power and reach; they have impact for good and for bad. In my position, I often deal with the bad.

Should investors rely on Connecticut to detect fraud and monitor this industry? Although Connecticut has uniform securities laws, the federal government is better equipped to provide oversight.

I'm in a somewhat unaccustomed role here, being the consumer advocate for and championing the cause of sophisticated investors, rather than the interests I normally advocate, which are those of folks on the street who perhaps have less resources than hedge fund investors. And to some extent, here I'm an advocate of increased federal intervention. Usually, state attorneys general resist increased federal action and instead advocate less federal preemption. But this issue is something new and different.

We're dealing here with an industry or a part of an industry that is growing tremendously. I think that's a fact we all accept. Specifically, it's growing tremendously in its appeal to a broader range of the public. It also may be because a broader range of the public is increasingly sophisticated and increasingly wealthy. Nonetheless, we're now dealing with a trillion dollar market and that's going to attract attention from regulators. That's a fact of political life. Hedge funds have power; they have reach; they have impact for good and for bad. Usually, I'm in the position of dealing with the bad.

Just to give one example: Someone came to my office, having invested in a hedge fund, and having tried for the last year to track down where the assets had gone. It appeared to be a garden-variety fraud, except of course it involved tens of millions of dollars. Now, should the State of Connecticut be the one to try to track down that potentially criminal activity? Should the State of Connecticut be the one that investors rely on to detect, discover, and monitor this segment of the industry? We have a Uniform Securities Act. We could try to enforce the provisions of the Act and seek criminal sanctions against that kind of malfeasance. But I would submit to you that it is the federal government's role to maintain continuing oversight.

As a matter of course, I think some kind of registration or some kind of regulation is inevitable. The question is, what kind? This brings us to the issue of unintended consequences. We think first, obviously, of the rule for registration that was passed by a very closely divided SEC.[1] As I understand it, the registration required under this new rule already applies to 40% or 50% of hedge funds anyway, so it's not regarded as a great leap. But what comes after it? The future is really the key question. No one wants to inhibit the economic role and the entrepreneurial value of hedge funds,

1. On October 26, 2004 the Securities and Exchange Commission ("Commission" or "SEC") voted to adopt new Rule 203(b)(3)-2 that will require certain hedge fund advisers to register with the Commission under the Investment Advisers Act of 1940 by Feb. 1, 2006. The Commission also adopted related rule amendments. See www.sec.gov.

but on the other hand, we have to recognize the reality that some kind of regulation is in the cards.

Some kind of registration is inevitable. If it doesn't come from the federal government, it *will* come from the states.

And if it doesn't come from the federal government, then it will come from the states. Make no mistake. There is the constituency for it — the political cauldron that will produce it. Whatever the motives, the consequences will be some kind of intervention.

Let me suggest one area where I think neither the critics nor the advocates have yet addressed a key question, and that is resources — resources on the part of the federal government. For me, the most telling argument against this new rule, and Commissioner Atkins made it very forcefully in his formal commission dissent, relates to the division and allocation of resources by the federal government and whether there will be sufficient resources to do the job effectively.

My experience as a federal prosecutor, as U.S. Attorney for Connecticut, and as a state prosecutor, is that the paucity or inadequacy of resources can mean bad investigations that cause trouble for everyone. A bad investigation is not necessarily only one that is not completed. It also may be one that focuses on the wrong targets or that fails to produce sufficient evidence against the right defendants. For a whole host of reasons, inadequate resources can be a major problem. If one of the unintended consequences of regulation is to produce a system that lacks sufficient resources to perform expertly and professionally, it will harm the credibility of the regulating agency, whether state or federal, as well as the industry.

We are wary of any unintended consequences. No one wants to inhibit the entrepreneurial and economic value of hedge funds. I'm skeptical of the illusion of safety that Form ADV carries with it. The tobacco industry hid behind the Surgeon General's label for decades.

I believe that one of the interests that both sides share is in providing sufficient resources for the regulatory authority — probably the SEC — to do the job right. On the other side of the coin, there is the interest in minimizing the amount of resources that it requires for hedge fund managers to participate in this system. In other areas, I've seen enough regulatory impact — call it a burden since it can be unnecessary in many cases — to be very wary of a system that imposes unnecessary costs on the industry being regulated. My feeling is that there is work to be done in fashioning an oversight system. It is almost inevitable in some form, to deal with the challenges and the immense potential for this industry.

I am very much in agreement with the idea that we need better cooperation, and I think we're moving in that direction. One of the questions raised in the dissent issued by Commissioner Atkins and Commissioner Glassman is that maybe we want to provide some exemption or exception for funds that are registered with one of the other federal agencies.

While regulation conjures all sorts of bad connotations, it does provide a place for people to go with information or tips, whether they go out of fear that they may be apprehended or for the sake of some higher ethical standard. If the federal government is not involved, if it has abandoned the field, those people with information effectively have nowhere to go and their cooperation becomes unlikely. So for the tipster or the sleuth or whoever it is, I think that regulation, as a symbol and as a specific place to go,

is very important if you want to promote that kind of cooperation among state and federal regulators.

Another point is, we've used the term "sophisticated investor." You know, sophisticated investors can be cheated, too. I never cease to be amazed by how very smart, experienced, sophisticated people can fall for what appear in hindsight to be very obvious scamming pitches! Rich people have rights, too. They should be protected also. Just because you're sophisticated doesn't mean the federal or the state government should say, "You're on your own; we don't really care about you. You're small in number; yes, you have a potentially huge impact on the economy (which I think is the point that was made), but individually, hire you own lawyer!"

Consider also the remarks we hear about certification or registration by the government providing a kind of "Good Housekeeping Seal of approval." Please don't misunderstand this comparison, but for years, the tobacco industry successfully resisted any regulation by saying, 'Well, you know, we already have the warning, which is approved by the federal government, stating that smoking is hazardous to your health. So we don't need any more federal regulation. What's more, consumers are fully warned; they know what they're doing." So there is an irony, you see, which comes back to a common refrain in regard to hedge fund regulation. It's not about whether registration is a good thing or a bad thing: registration in and of itself, the Form ADV[2] in and of itself, is worthless. It's about what happens after registration, and how useful or burdensome that next step may be. I think that point is suggested very forcefully in the dissent.

If the federal government or a state government purports to be providing a seal of approval, it had better be doing its job, because it is deceiving people if it creates the illusion of safety or security without really providing the resources, oversight, and the competence. It's not just about numbers of people, it's the competence of compliance examination and enforcement that's important. ■

Inadequate resources may produce bad investigations. Bad investigations may focus on the wrong targets and fail to produce evidence against the right defendants. It will harm the credibility of the regulating agency and may chill the industry's creativity.

Richard Blumenthal was first elected to serve as Connecticut's 23rd Attorney General in 1990, re-elected in 1994 and 1998, and then re-elected to an unprecedented fourth term in 2002. Since his first term, Attorney General Blumenthal has been a tireless advocate for consumers, the environment, children, and the civil rights of Connecticut's citizens.

Mr. Blumenthal's leadership and innovative use of his office have helped to stop the hostile takeover of New Britain-based Stanley Works, a major Connecticut employer, drastically reduce unjustified utility rate increases, stop chronic polluters from endangering people's health, and protect consumers from misuse of their charitable donations. Mr. Blumenthal has personally argued in court on critical issues affecting Connecticut's citizens, including defending that state's ban on assault weapons and its welfare-reform law.

2. Advisers use Form ADV to register as an investment adviser with the SEC and is also used for state registration.

He also has saved taxpayers' money through aggressive litigation, forced companies violating consumers' rights to reimburse them, enforced measures to reduce health insurance fraud through the creation of a health care fraud unit, and worked to preserve access to quality health care and protect the rights of senior citizens. Mr. Blumenthal has been a leader in the fight against the tobacco industry, initiating legal action, legislation, and other measures to combat its deceptive marketing — aimed particularly at children.

He has further sought to protect children by aggressively enforcing abuse and neglect protections, and pursuing parents who owe child support payments. The Attorney General's "Wanted" Posters, coupled with arrest sweeps of delinquent debtors and other initiatives, have helped to apprehend hundreds of law-breaking parents.

Before being elected Attorney General, Mr. Blumenthal was a member of the Connecticut State Senate from 1987 to 1990, and the Connecticut House of Representatives from 1984 to 1987.

Mr. Blumenthal also served as United States Attorney for Connecticut from 1977 to 1981. His leadership as the chief federal prosecutor for Connecticut resulted in the successful prosecution of many major cases against drug traffickers, organized crime, white collar criminals, civil rights violators, consumer frauds, and environmental polluters. He also served as administrative assistant to United States Senator Abraham A. Ribicoff, as aide to United States Senator Daniel P. Moynihan when Mr. Moynihan was Assistant to the President of the United States, and as a law clerk to Supreme Court Justice Harry A. Blackmun. From 1981 to 1986, he was a volunteer counsel for the NAACP Legal Defense Fund.

Mr. Blumenthal graduated with honors from Harvard College (Phi Beta Kappa; magna cum laude) and Yale Law School, where he was Editor-in-Chief of the Yale Law Journal. *He also served as a sergeant in the United States Marine Forces Reserves.*

Regulating Private Funds: Culture of Compliance or Unintended Consequences?

Brian Borders, National Venture Capital Association

October 28, 2004

When the hedge fund investigation began, venture capital had a moment of wondering, "What has this got to do with us?" The venture capital industry is similar to the hedge fund industry in some ways, in particular in the exemptions from federal registration and regulation that it enjoys. But in many other ways it's quite different. It's fair to say that hedge funds don't do venture capital and venture capital funds don't do hedging. And they're different with respect to the potential for market impact. When we compare what the SEC does with respect to private equity, we see there may be a nexus with respect to the regulation of the markets and the potential impact that hedge funds have on the markets. It's certainly not the same kind of potential for venture capital.

So during the two-year investigation of the hedge fund industry, the National Venture Capital Association (NVCA) sat back and let it proceed with assurances that it really had nothing at all to do with venture capital or private equity. As a result, the NVCA didn't produce and still does not have a position as to whether the SEC or a state regulator ought to regulate hedge funds. Nonetheless, when we read the 2003 hedge fund report the SEC produced,[1] we saw there were many places where, in describing the rationale for regulation of hedge funds, it wouldn't have been difficult to take "hedge fund" out and put "venture capital fund" into many of those sentences, and it would have made perfectly good sense. That, unfortunately, is the situation we find ourselves in now, in a macro sense, now that the rule has been approved.

Currently the only practical distinction between hedge funds and venture capital is the two-year lock-up test. This liquidity test was created when we helped the Treasury for anti-money laundering reasons. This liquidity test might unintentionally harm hedge fund investors.

The distinction that has been made between hedge funds and other forms of private equity funds revolves around the redemption provision, specifically a two-year lock-up. It's a practical distinction that arises from work the U.S. Treasury Department did on money laundering programs and regulations a couple of years ago, and the NVCA helped them work through the question of whether venture capital funds ought to be regulated for money laundering in the same way that hedge funds would be regulated. The liquidity distinction made sense in that context.

In the context of securities regulation and investor protection, however, the lock-up period distinction doesn't make much sense. In fact, it may work the other way.

1. For the full text of the SEC's report "Implications of the Growth of Hedge Funds," go to http://www.sec.gov/news/studies/hedgefunds0903.pdf.

The other criticism of that two-year distinction is that it's relatively easy to game. Many people believe that top-tier hedge funds will simply extend their lock-ups so that they'll fit into the exception for private funds.

Going forward, and in terms of unintended consequences, the final conclusion of the NVCA's comment letter[2] was that this rule — again, a rule that we don't necessarily oppose the effect of, which is regulation of hedge funds based on this rationale — is a path, an outline, for how the SEC would at some point down the road extend its jurisdiction and remove other exemptions to include venture capital and private equity without nearly the kind of length and apparent deliberation that it undertook with respect to hedge funds.

Fraud will not be reduced by this rule.

There are three pieces of this rationale that are particularly troubling. One is that if you parse the release in the hedge fund report carefully, it says that the incidence of fraud was a major consideration in the SEC's decision with respect to hedge funds. As Commissioner Atkins and his colleague Commissioner Glassman pointed out very effectively in their dissent to the release, this just doesn't stand up to analysis. The fraud cases that they cite are not cases that would be addressed by this rule; in many cases they're not really hedge funds, they're just boiler rooms, garden-variety frauds that call themselves hedge funds.

We have to ask: If you require hedge funds to register and garden-variety fraud has found a niche in private equity, will they not start calling themselves venture capital? If the use of the term hedge fund to raise money for a fraud is rationale for SEC regulation, then the use of the term venture capital in the same context is just as much a rationale.

Retailization does not exist in pension funds as the SEC staff claims. Pension funds are overseen by fiduciaries.

Most troubling is the notion of retailization. In their lengthy report the SEC said they didn't find it. Retailization was simply something they were concerned about that they really did not need to be. That gave venture capital some breathing space because we thought that if the report finds there isn't much to be concerned about, there probably isn't going to be regulation in this area. The house next door is going to stand, as well as our house.

However, in the final rule — the one that has been approved — a leap has been made between pension fund investing and retailization. Pension fund beneficiaries ought to be protected. They largely are protected; they're protected in many ways by many statutes, legal obligations, and other federal agencies. But to suggest that retail investors are implicated by the fact that a pension fund would invest in a private equity vehicle is a great leap, and it certainly leaps squarely into the place where venture capital works, where venture capital makes money, and where venture capital has had a long history of working relationships with limited partners in the private and public pension fund area.

So this rule, although we're in the position of saying thank you for not intending to involve venture capital in this regulatory effort, really we're forced to say, no thanks, this rule seems simply an outline for the next step toward further regulation.

2. See http://www.nvca.org/pdf/HedgeFundletter.pdf.

An additional concern has been pointed out by Alan Greenspan, who believes that the SEC's proposed rule won't work. What do agencies tend to do when they have a rule that gives them authority, gives them responsibility, but doesn't work? They expand the regulatory reach to make it work. At that point, it would be a very easy thing to begin to think about expanding it into other areas besides hedge funds, such as their neighbors in venture capital and private equity.

We saw that hedge funds showed quite a bit of interest and support for improving or increasing the amount of information about hedge funds available to the SEC and to other federal agencies. Since this idea has additional filing requirements, it's basically telling the world who hedge funds are, what they do in general terms, and who their investors are. In the meeting at which the rule was approved, it was very clear that what the proponents of the SEC rule had in mind was examination. They want more than just a means of getting solid information that they could put in a database and slice and dice. They want to be able to go into the firms and examine them.

With respect to unintended consequences, again, there was an interesting exchange during that meeting between Commissioner Glassman and the SEC staff where Commissioner Glassman was pressing them on the question of how examination will provide a deterrent effect. Her point was that examination isn't going to be effective enough. The response from the staff was that the deterrent would come from the compliance officer saying, "When the SEC comes, I'll never be able to explain this." Now, suppose "this" is something that's completely legitimate? Suppose it's something that's just complex and new and innovative? Those, I think, are the kinds of unintended consequences that are most serious for consideration in the hedge fund industry. ■

The most serious consequence will occur when a general partner wonders 'how will the SEC view this?' even though the investment is legitimate. That will stifle innovation.

Brian Borders is the founder and principal of Borders Law Group. He serves as outside counsel to the National Venture Capital Association as well as other trade associations and corporations. He has a wide range of experience in federal regulatory and legislative matters, having worked on controversies within the jurisdiction of a number of congressional committees, federal agencies, nongovernmental agencies, and self-regulatory organizations. He specializes in matters of interest to private investments funds, publicly traded companies and other capital markets participants.

Over the course of his 20-year career in Washington D.C., Mr. Borders has represented individual clients and large coalitions on reform of the securities class action litigation system, a host of SEC rule initiatives and numerous high-profile accounting rule controversies. Mr. Borders has also served as a public governor on the boards of the National Association of Securities Dealers (NASD), NASD Regulation, NASD Dispute Resolution, and the NASDAQ Stock Market.

For 10 years, Mr. Borders was president of the Association of Publicly Traded Companies (APTC), a nonprofit business association of more than 900 companies. In 2002, APTC merged with the American Business Conference, a Washington D.C.-based group with similar membership and goals, with which Mr. Borders continues in an advisory role.

In the late 1980s, Mr. Borders was legislative counsel to a senior member of the Senate Banking Committee. During this time, Mr. Borders worked on major reform of financial services and securities legislation, and a variety of tax and budget matters. Before working on Capitol Hill, Mr. Borders practiced law in Washington D.C. and San Francisco, primarily in the areas of federal legislation as well as complex civil and criminal litigation.

Mr. Borders has addressed national and regional meetings of various organizations and participated on panels before corporate, investor and international business groups. He serves on various American Bar Association committees and the Planning Committee of the Annual SEC Forum on Small Business Capital Formation.

Mr. Borders earned his JD at the University of California, Hastings College of the Law, where he was selected for the Order of the Coif and the editorial board of the Hastings Law Journal. He earned a BS degree at the U.S. Military Academy at West Point and served in the Army in a variety of command and staff positions.

Outlook on Health Care & Life Science Strategies

Rob Langer, Massachusetts Institute of Technology

July 15, 2004

First, publish your paper in a critical, peer-review journal like *Science* or *Nature.* Second, translate it into a good blocking patent with claims that make it difficult for others to infringe. Third, take what you have found and move it far enough so that an investor feels it can succeed. For me, that might involve getting proof of principle in an animal, not a test tube. Fourth, develop a platform technology where the same manufacturing process can be used over and over again.

After I got my PhD in 1974, I worked at a hospital and then I became a professor at MIT and I published a lot of papers. But one of the things I found frustrating was that we'd publish the papers and that's kind of all we did for a number of years. I thought we were making some pretty good findings, and I wanted to get those findings out there to help people. Just publishing papers, unfortunately, wasn't doing the job. Getting involved by licensing things to companies was the first step. The problem with licensing, though, is that sometimes large companies will take a license, but they'll do just one experiment a year. That's just not very gratifying on this end. Some of the discoveries didn't move nearly as quickly as I wanted.

Getting involved in starting companies actually became a great vehicle for moving discoveries to market faster. Over the last decade and a half I've done that quite a bit, largely with Polaris Venture Partners. Looking back, whether at things we've done or other people have done, when evaluating a health care or life science start-up, I've found that four elements actually are very helpful from a science standpoint.

Obviously there's no way for me to quantify the people element other than that you want great scientists and you want great business people. But from a science standpoint, I found these four things to be very helpful: the first is having a scientific paper published in what I'll call a seminal journal. I'm not sure what it's like in the financial community, but in the scientific community there are thousands of journals but there are really only two or three that go through an unbelievably critical review. Good examples are the journals *Science*, *Nature*, and one or two others. If you can go through this incredibly rigorous peer review so that scientists think it's actually very, very good science, that means a lot.

The second element is translating the very good science into a really good patent — a patent that includes certain "claims" that make it very difficult for other people to infringe on what you're doing. People use the term "blocking patent."

The third element is actually taking what you have found and moving it far enough along in the development process so that an investor can feel it's got some reasonable chance of success. To me, that means getting a proof of principle in an animal. I'm sure all of you have seen that sometimes things are in people and they still may not work. But a lot of times you can see good findings and they're done in test

tubes. To me, that's still too low in the scale. You really want to have it in an animal model, maybe several animal models, to prove it works.

The fourth component is actually a little bit more complex and perhaps may be best explained with a story. About 14 years ago, one of the vice presidents from a local biotech firm came to see me. It turned out the company was a public company; it wasn't doing that well and he basically had been let go. We were just talking, and I asked him, "Why do you think your company didn't do better?"

He said, "You know, Bob, we have four products in the clinic," (which is very good for a biotech company). "We have four different manufacturing processes to make each of them and it's unbelievably expensive. If we had just one manufacturing process to make those things, that would have lowered costs tremendously" (and of course the medical area is extremely expensive). "That would have been great and made a huge difference."

So that you don't face the same problem, you need what I call a platform technology. That's when the same manufacturing process can be used over and over again for different things, which allows for multiple shots on goal. The medical area is unpredictable. You don't know whether you're going to succeed with your first product or not. But if you can take the investment in the manufacturing procedure that you've developed and everything else, including the infrastructure, and apply it over and over again, and it's a good idea, I expect you will succeed. And when you do succeed, it may be with a multi-billion dollar product.

David Edwards and I examined the absorption rate of aerosol inhalers. It was 2-3%. Manufacturers tried to redesign the aerosol injectors, but we redesigned the aerosol particles instead, and the absorption rate increased to 60%.

I'll illustrate with a couple of examples. One area that we did a study in illustrates how things can come out of academics and how academics work. In 1994 someone came to my lab who wanted me to hire him. His name was David Edwards, and he was largely a mathematician. He actually had never done an experiment before in his life, but he was really nice, really smart, and I hired him as a post-doc. One of the things we work on is drug delivery systems, and in the first paper he and I worked on, he handed me a paper with 300 equations describing how drugs could pass through the skin. I always felt my big contribution was reducing that to 250 equations so that people could understand it a little better. Actually, the paper even won a bunch of awards, although not for communication.

At any rate, I mentioned to him that there's another area where I think we might be able to make an impact — it has to do with delivery of aerosols, delivery of things to the lung. He'd actually done some mathematics of lung function, too. I'd noticed that there were a bunch of large and small companies that were trying to develop better inhaler devices for people with asthma and similar problems. People had begun to think maybe you could even deliver drugs like insulin by inhalation rather than injection.

But the problem was that aerosol delivery is incredibly inefficient and you're lucky if you get 3% of the drug from the inhaler into your lung. The reason is the drug particles you inhale from an inhaler are incredibly small — two or three microns — and

act kind of like wet sand. This "sand" in your inhaler aggregates, as sand does — it sticks together. It sticks together in the inhaler, outside of the inhaler, in the mouth, and in the lung. Some companies developed better inhalers to break apart the sand, so to speak, and maybe they got 4% or 5%, which was actually a big deal. You could almost make the inhaler half the size.

But nobody ever looked at the aerosol particles. Could you redesign the aerosol particles themselves? You might think — how could you do that? David Edwards and I started talking about it — and this is often how science can be — people always thought aerosols had to be very small or otherwise they wouldn't have the right aerodynamics to get into your lung. If you made them bigger, for example, they'd stick in the back of your throat.

We started wondering, what if we made these aerosol particles bigger but made them incredibly light. From a math standpoint, people always say aerosols are water and have a density of one gram per cubic centimeter. We decided to make these aerosols with one-tenth the density. Usually if you look under a microscope at a regular aerosol that anybody would normally take, it would look like a little golf ball or a little baseball. What we decided to do was make big whiffle balls, a fundamental paradigm shift.

Our idea was to make these aerosols big, but incredibly light. We calculated that they'd still have the right aerodynamics to get deep into the lungs. But because they were big, they didn't stick together as much — wet basketballs are not going to stick together like wet sand. We were able to get 60% or 70% drug delivery instead of 2% or 3%. We'd be able to make the inhalers smaller by a factor of ten, maybe even 40 times.

In addition, whenever an aerosol goes into the lungs, cells called macrophages eat the aerosols. They eat it quickly so the aerosols don't last long and you have to take it again. Big aerosols take a lot longer to eat. So we were actually able to make some of these aerosols last for several days with a single whiff. That was our theory, so then we went ahead and did experiment after experiment to test the theory — first in test tubes, then in animals — and proved that it worked. We published it in *Science*, one of those journals everyone recognizes as vetting good science. We got very broad patent coverage on it and started a company.

Pretty much every large pharmaceutical company wanted to use it. There were big multi-million dollar deals right away with Eli Lilly, GlaxoSmithKline, and Pfizer. We were in the clinic with two different drugs within a year, and within about 18 months four different companies wanted to buy it, which was great. After picking a buyer we calculated the IRR on that as more than 500%.

There are certainly ups and downs. With good science, a number of them will continue to do quite well. That's really the key: the ones that have good science will do well. However, if you do new chemistry then it will take longer. Aerosol delivery was just

Terry McGuire and I got a blocking patent and started the company. Terry got multi-million dollar deals with Lilly, Glaxo, and Pfizer. We sold the company for an IRR of 500%.

a new geometry and much simpler from a regulatory standpoint. With Momenta, we're picking drugs that are already in existence, so if you're able to come up with strategies that short-circuit or greatly facilitate the regulatory path, it's very helpful. In cases where we haven't done that we've still got reasonable IRRs because it was based on good science. It all goes back to those four principles.

A second example is a bit more recent. There are a couple of areas of macro molecules I'm sure people have heard about. Genomics, which is DNA, is one very important type of macro molecule. Proteomics, that's the second important macro molecule. There's a third that people didn't study nearly as much, and that's glycomics, or sugars.

Macro molecules in the human body are made up of DNA, proteins, and polysaccharides. Unfortunately — or fortunately depending on how you look at it — as complex as DNA and proteins are, polysaccharides are a lot more complex. The reason is that proteins are mono-dispersed. Every single insulin molecule is exactly the same, has exactly the same molecular weight; every amino acid is the same, and so forth. That's also true for DNA. But polysaccharides are not mono-dispersed. Heparin is an example of a polysaccharide that people often take. And most proteins are what's called glycosylated. They have sugars on them, too. People taking heparin probably get at least 100 different heparins. Different molecular weights are in the mixture and they also have different degrees of what's called sulfation.

Glycomics is an under-researched area. The science of sugars is complex.

Polysaccharides are more complicated to sequence than DNA or proteins. But fortunately at MIT we have some smart people who were my graduate students. Over a period of time, probably 20 years, we cloned a series of enzymes that could break up these polysaccharides and we worked out a whole set of techniques whereby we could, for the first time, sequence polysaccharides or glycoproteins. This was also published in *Science*, and we also got a series of very good patents on it.

Whenever you take a polysaccharide or a glycoprotein, you're not just taking one thing; you're taking many things. Out of this mixture of polysaccharides, some will have longer half-lives; some will be absorbed more rapidly; some will actually be targeted to certain cells better. Because we have the sequencing technology, we'd be able to find out which ones would do that, and from a regulatory standpoint we'd have a much easier path because people were already taking those drugs so basically we know they're safe.

We'd be able to find a super heparin or a super glycoprotein in a relatively straightforward manner by this kind of approach and that's what we did. We formed another company, in this case called Momenta. We recruited a very good CEO, Alan Crane, and picked as a first product, heparin. We got a major deal with Novartis. Momenta went public in June 2004 and had an IRR for Polaris of 125%.

We're working on a few things toward the future. One of them is the area of nanotechnology and micro-electrical mechanical devices. Recently we've created a whole series of microchips. They have little nano-wells in them, and we created a

whole pharmacy on a chip. We're making incredibly smart systems where we can give people all the drugs they need someday, and put little biosensors on these chips. For example, a diabetic could detect glucose and tell the chip how much insulin to release. They're all in little nano-wells and there are various versions — some could be remote controlled, for example, by telemetry. Wells in these chips could open the same way garage doors open, for example, but it's not by something in your car; it's something in a wristwatch or in your pocket.

We're also working on ones that might be self-controlled, with biosensors in them. Medical record keeping is a problem, but with a chip, whenever you take the drug, that information could be transmitted into a computer at your house, a doctor's office, or a hospital.

Work in stem cells and the whole area of tissue engineering had many of its origins in our laboratory. From a practical standpoint for patients, there are many, many diseases that drugs can't treat and probably will never treat. There's no way I see a drug treating liver failure. Right now the only way to treat that is by transplant. Paralysis and diabetes have no clear cure thus far. There are many tissue problems or organ problems that single molecules are not able to treat. But cells can do something that single molecules can't. That was the whole idea we wanted to advance in terms of tissue engineering. Maybe someday we'd be able to take cells — stem cells or other cells — and actually make a new tissue out of them; make a new liver; make a new spinal cord. The vast potential of stem cells and tissue engineering can solve some unmet needs and improve people's health in ways that no other type of approach can. This is not something that is going to generate products right away, and the key from a business standpoint, is to look for ones that are not going to be 40 years in clinical trials, but ones that can solve some unmet needs reasonably quickly.

We do work on nutrients as well as the immune system, and there are exciting developments occurring. However, whether they provide catalysts to form companies in and of themselves is less clear. Let me be specific on nutrients and food. I was involved in getting a company started in the nutrient area — it spun out of another company we started, but the difficulty was that the culture in the nutrition area and the food industry is prohibitive to achieving good business deals. It was a high volume/low margin business, so even though it made some money and did okay and actually had products, I don't think it was a spectacular success. It was a 30 to 50 million dollar company, which is great, but not what I think the venture capitalists probably look for.

There have definitely been exciting findings in the immune system area, but they're so basic that it's been very difficult to translate them, as a single discovery, into something that would make a good patent you could protect and therefore franchise to different large pharmaceutical companies. Also, it's so far away from the clinic, which goes to the point that I don't think any hugely successful company has been started based on that. That doesn't mean it won't happen someday, but at least when I look at those two areas, those are some of the things that I think are difficult. However, great science and great discoveries are proceeding. ■

We are now working on nanotechnologies or micro-electrical mechanical devices. We've created microchips that can hold a whole pharmacy with a biosensor that detects what your body needs.

Robert Langer is a professor of Chemical and Biomedical Engineering at the Massachusetts Institute of Technology. Dr. Langer has written more than 800 articles and has more than 500 issued or pending patents worldwide. His patents have been licensed or sublicensed to more than 100 companies, a number of which were launched on the basis of these patent licenses. He served as a member of the U.S. Food and Drug Administration's Science Board, the FDA's highest advisory board from 1995 to 2002, and as its chairman from 1999 to 2002. Dr. Langer has received more than 120 major awards. In 2002, he received the Charles Stark Draper Prize, considered the engineering equivalent of the Nobel Prize. In 1998, he received the Lemelson MIT Prize, the world's largest prize for being one of history's most prolific inventors in medicines. Forbes *magazine named him one of the 25 most important individuals in biotechnology in the world. He serves on 15 boards of directors and scientific boards of such companies as Wyeth and Momenta Pharmaceuticals. He earned his Doctorate of Science from the Massachusetts Institute of Technology in 1974.*

Outlook on Health Care & Life Science Strategies

Terry McGuire, Polaris Venture Partners

July 15, 2004

We do early stage investing … at the University level. Everything but the idea and the technical founder is missing. Our challenges and opportunities arise from the marriage of science and business … a transfer from University to commercial application.

Our approach is focused on the early stage of both life science and information technology. It really is the earliest stage, and we mean early. Early at the university level. We're talking about taking science where nothing is there except for the technology and the technical founder. It's a very, very different model from investing in existing companies and products.

We're a $2 billion effort, but two-thirds of what we do is in the IT space; one-third is in life science. So we're still a diversified fund. Over the eight years since we created Polaris, we've invested in 38 companies in the life science sector. To date they've generated about a 33% annual return. Within that, 19 of those companies were my own companies and as a group they've generated a 47% rate of return over this eight-year period.

Then we have this rarified group called the Langer Portfolio, which comprises eight companies that to date have generated a 55% rate of return. By the way, you never hear the terms EBIT or EBITDA with any of our companies. If you do, they have brackets around them. It's something that we have to be very aware of and one of our significant challenges.

I want to stress that what we do really is an early stage marriage. It's a challenging marriage of science and business. Many scientists do extraordinary work in their labs, but the academic paradigm is very different from the paradigm that we all live in. Academics are rewarded on a different scale. So even at the moment of the inception of these companies, with the exception of a rare few scientists who know business, often whole systems have to change; the paradigm has to change. Not just how do you do great science, but how do you convert that into products? So this paradigm shift can often represent a challenge.

The biggest challenge is the long path from idea to product launch; often it involves ten years of $100 million losses. That said, the opportunity is huge. A single product can generate a billion dollars with 90% gross margins.

Probably the biggest challenge, however, is that the commercialization of life science follows a very long path that somehow has to be funded. From the time unique biological discoveries hit the bench, it can often be a decade before a product hits the market. Those losses can exceed $100 million — it's not unusual for a private company to raise as much as $100 million through its path. And by the way, you have to get a return, and almost always through that decade-long path there are rights given away. No company can really do it by itself. It has to give away value along the way. Putting together a model and figuring out the jigsaw puzzle

that allows you to ultimately generate a positive return is really an obstacle — one that takes time to overcome.

With that said, the opportunity is huge. Ours is probably the only industry where you can talk about billion dollar products — a single product can generate more than a billion dollars and often can have up to 90% gross margins. There is a promised land and there's really not very much price negotiation when it comes to major cures. I mean, most people take the price because it's a huge innovation. Now the question is — how do you negotiate that path?

You have to start with a big idea. That big idea has to have at least one of these two qualities: It has to be a brand new franchise; it has to meet a compelling, unmet medical need. Or, it has to threaten an existing franchise, and threaten it in a real way. It can't just be a "me, too" product; it has to truly innovate in an area where there's an existing billion, two billion, three billion dollars of market. And if you can come along and threaten that position, the market holder will look at you very seriously.

The second thing is you have to have the right team. But I want to remind you again, when these companies are started, nothing is there except for the idea. So we have to build these teams along the way. Unfortunately, we don't have the fortune of backing a pre-made team on Day One. Our job along the way is to build an A class team. If you start with a big enough idea and wonderful economic founders, that's a good start.

We look for a fair deal with corporate partnerships. Adding partners or management teams is dilutive. Managing these dilution events is the challenge. Unlike IT investing, there are few repeat entrepreneurs in life sciences, mainly because the path to product launch is so long.

The third item that's required along the way is syndication. No one company can do it alone. We really do look to work with other venture capitalists and work very hard at syndication. Our current fund is a $900 million fund, but even with that I might only put $20 million to work in a company through its life. Putting it to work at Day One is a huge mistake. One of the good things that's happened in our business is that a new respect for early stage life science investing has begun again. There's been more capital flowing into it. Back in the 1990s, capital was actually flowing away. So syndication and syndicate partners are working better these days.

The fourth thing that's required is corporate partnerships. There are good opportunities and bad opportunities. What you're really looking for is a fair deal in a corporate partnership. The problem is that at the beginning you only have the big idea and every time you bring on resources, whether a corporate partner or additional equity or management, those are value-added events. Managing those value-added events is hugely important.

There's a delicate balance between opportunity and threat with corporate partnerships. In the case of one of our companies, Advanced Inhalation Research, we threatened a lot of franchises. Pulmonary delivery represents a $5-6 billion market today, so anyone who had a pulmonary program had to look at us. They looked at the concept and then they looked at the team we were funding and they said, "This is going to be really important in our space; we better pay attention." So we found a way to avoid dilution. The idea was big enough that we could give away small parts of the

franchise in these corporate deals without giving away the entire franchise. As a result, for every dollar of equity we raised $10-15 of corporate money at much higher prices. They paid 20 times what I paid for my investment, and because we had a big idea and elegant science, we had a hugely proprietary position.

Finally, the other challenge that's striking about our business as opposed to the IT business is that in the IT business you often have repeat entrepreneurs. They'll start a company; they'll run it for three, four or five years; they'll sell it and make 50%-60% IRR, and then they'll go start another company. It's very unusual in the life science space that you have a repeat entrepreneur, and that's because this path is so long. Most entrepreneurs that start their companies really stick — they have the commitment to bring these products onto the market and so they'll stick with them for 15 years and then they're really not up for another 15-year stint. They want to do something else. So oftentimes when we're building teams, we can't rely on someone who's done it three or four times.

It is a marathon. You have to pace yourself and not lose your nerve. Other firms have failed because they are over-concentrated. It leads to irrational behavior when the hard times hit.

Our success, I think, has been driven by three factors. First, we've been diversified. I mentioned that Polaris is both IT and life science. Even within the life science sector about 40% of our investments are in the biotech space, 40% are in the med-tech space, 20% are in "others." I argue that diversification allows you to do rational things during irrational times.

The second key to our success is working with great partners. We've had the great pleasure of working with such eminent scientists as Bob Langer,[1] Phil Sharp,[2] Paul Shimmel,[3] and others who are truly transforming their spaces. The fundamental factor of success is recruiting great teams and we've been able to do that, and ultimately we can invest in great science.

The third element is that we've paced ourselves. I mentioned that ours is a $900 million fund. We'll put $20 million to work through the life of an investment. But we're not afraid to put half a million dollars to work on Day One. In fact, I was recently on a board call where, with another group, we put up a million dollars to seed a company. It's at its next level. We're talking about putting $2 million between the two groups. But along the way I'll have the ability to put $15 or $20 million to work in that company. If we pace ourselves we can do great things.

I think others in our sector have failed for several reasons. The first is that many of them are overconcentrated. During the genomics craze two or three funds got set up to do just genomics efforts. Overconcentration is a real difficulty in our business. It also leads you to do irrational things during irrational times. When your whole sector is falling out of favor, it's very difficult to stand up and try to make new investments. Your psyche's just not there. You're working with all your problem children, and, in fact, it may turn out to be the best time to be making new investments.

The second reason for failure is that many people in our space don't realize that this is a long path; it's a marathon, and they lose their nerve along the way. In hindsight

1. Robert Langer is a professor of Chemical and Biomedical Engineering at the Massachusetts Institute of Technology (MIT), who also spoke at the July 2004 health care symposium (see his speech starting on p.29 of this journal).
2. Philip A. Sharp is a Professor of Biology at MIT and Director, McGovern Institute for Brain Research. In 1993 he won the Nobel Prize for Physiology.
3. Paul Schimmel is Ernest and Jean Hahn Professor at The Skaggs Institute for Chemical Biology at The Scripps Research Institute.

you can always make the call, whether it's losing your nerve or making a judgment, to walk away from a deal. I've seen too many people jump into the space, then realize it's going to be a long haul, so they jump out.

The third reason is that people have over-committed up front. There used to be a logic to our business that said the cheapest time to buy into a deal is at the beginning, because of the low valuations. If they have $10 million for a deal, they'll put $8 million to work Day One, because now they own 60% of a company. But by the way, with each subsequent financing, they're expected to play; they're expected to defend that 60% position, and if they don't, our world is very Darwinian. If you can't play, hand your shares back — we'll wipe you out. Many investors have lost sight of the fact that you have to pace yourself along the way.

The fourth thing investors have to contend with is that some groups have decided they're going to back themselves. They come up with an idea and create a company around it and start funding it. They really don't seek out the counsel of scientists with an eye to business potential to see whether it is good science and good medicine and then ultimately they face disaster.

Other firms have jumped in and jumped out of healthcare. They bailed in the darkest days and lost opportunity at the best possible time. They also lost serious credibility in the marketplace.

The fifth problem that has plagued our industry has been "jumping in/jumping out." Back in the mid- to late-1990s, many firms that were diversified became specialized in IT and they abandoned the life science base. Now some of those have come back, and I think entrepreneurs and others question how long they will last. They've lost credibility in the marketplace. You don't want to be in a long-term race with a partner who may decide, for strategic reasons, to leave two or three years into the process.

Yet another difficulty occurs when they've lost opportunity. I went back and looked at the portfolios we created in 1997 and 1998. The companies in which we invested in 1997 have generated a 91% rate of return. Those in 1998 yielded a 78% rate of return. During the darkest days when everyone was saying get out of this space, because of our diversification, we were able to do rational things during irrational times and the results have proven themselves.

The core to our success, though, is our partnership with a commercially minded scientist like Dr. Langer. I met him back in 1993 at a company that was then called Polymers for Medicine. It was immediately clear that he knew a lot about different areas of science and was very creative and brilliant.

I came into the meeting knowing that he was world renowned. Dr. Langer could pick up the phone and gain entrance into almost any board room of any pharmaceutical company and have enormous credibility. He is prolific. If you ever have the pleasure of going up to see Dr. Langer's lab at MIT, he's not just doing one bit of science, he's doing tissue engineering, stem cell research, drug delivery research, bio-materials, and biotechnology. It really is a panacea of great things, and he's an individual of the highest integrity, which was very clear.

Getting to know Dr. Langer through the process, I realized he had other attributes that were particularly special. He was passionate about taking his science and turning it into products. He realized that many of the scientific discoveries that he was making were going to transform people's lives. So he had a passion for not only doing great academic research, which he does, but also for translating it into something real.

With that, he was very realistic about the venture process. He understood that this was a marathon; that there were compromises that were going to be needed to make it along the way and that you had to be aware of those compromises. The one attribute that I especially liked about Dr. Langer, particularly once I was his partner, is that he hates dilution. Once you're his partner, you also hate dilution. You work very hard at finding ways to raise the required resources without giving away too much of the company.

Together we've invested in eight companies. Of the four-company portfolio that generated an 84% IRR, two are today public and two have been sold. Four companies are still in development.

The biggest "don't" in our business is over-committing capital up front. This is a marathon. To try to run this game as a sprint, to try to sell out early, is a mistake. The things that people do when they do it well are to back big ideas and then continually build those companies. Don't assume you have it from the get-go. Be prepared for the marathon and then work with great partners.

In terms of ebb and flow of the industry, all of these companies need capital along the way, and there are various levels of capital to be invested. Currently there's not a lot of mezzanine and early stage capital around. If someone were to target investment in companies that had products in the middle of clinical trials beginning to demonstrate human efficacy of some kind — that probably is an unmet need right now. Most people are much more interested in investing in Phase Three products that are much closer to commercialization and I think if I were to target an unmet need in an area where there's need for capital, it's the Phase Two product. There's plenty of risk in Phase Two, and people understand you have to get paid for that risk.

A lot of people are focusing time and attention on this decade — the path being so long. People feel that if you can generate tools that can expedite going from preclinical to Phase One, and Phase One to Phase Two, Phase Two to Phase Three — that if you can abbreviate the path, there's going to be huge value created. There's no question that there would be huge value created. That's the good news.

The bad news is that there's consolidation going on in the pharmaceuticals industry. And with fewer and fewer customers — in economic terms an oligopoly — there are fewer buyers for it and you're not going to get paid for it. Therefore you'll cut a deal with Pfizer and you'll cut a deal with Merck and you'll cut a deal with Novartis, but then it gets a little bit squishy.

There's also buzz around post-genomics — what does that mean? There was this push, the gold rush, where a number of companies were created in the genomics space. Keep in mind, the genome in and of itself is just a door opening. We're going into the new millennia of biology. It's really enormously exciting. We know that there will be real value being created through genomics. There are some who think that a few of the post-genomics plays are interesting — especially those companies that survived and still continue along the path with interesting developments. They're at a relatively low value point right now. They had so much hype attached to them in the past that they did not totally deliver against the hype, but they probably did deliver against their original business plans. Actually, some of those companies are reasonably well funded, so I think there's reason to study them.

If I look at our portfolio, not every one of our companies succeeds — ours is a high-risk business. I think some companies can't succeed because the technology doesn't work, although that tends to show up early since it's one of the easiest things to figure out. Some companies don't succeed because they can't find that magic and they have to raise $90-120 million along the way. You have to wait until you get to the promised land of a billion-dollar drug, but by then you've been diluted a lot along the line.

We had a company that was considered a failure, where we jumped in and didn't meet our clinical endpoint. A major corporation had put $90 million into the effort. It was very compelling science but they needed to abandon it for their own strategic reasons. It had nothing to do with the science which in the clinic had very promising Phase Two clinical data. We ran the Phase Three trial — all truth comes out at Phase Three — and in fact we realized there was only a subpopulation of the community we served; the majority of the population wasn't going to benefit from this product. That's a classic way to fail.

For the most part we all benefit from the hard vigilance of the Food and Drug Administration (FDA). They have to ensure that when therapies and diagnostics come to the marketplace, they fundamentally don't hurt people. And with that said, they are almost by definition the most risk-averse group in the world because we all want them to be risk-averse. If I were to suggest something to the FDA, it would be to figure out a risk management program. How do you expedite it? You could introduce a therapy that might hurt somebody, but what is ultimately forgotten is that by not letting a therapy enter the market for another five years, thousands of people may die. I would like to see someone come up with a better equation for how to manage risk and therefore educate the populace to understand that the FDA is going to take some risks and it can't be penalized. It's just staggering how long it takes to get all the way through the clinic. I think more recent administrations have been very sensitive to that and have tried, but I think ultimately you have one person who screams about getting hurt by a therapy and the next thing you know, the FDA goes back to the risk-averse mode. However, if there were a way to change that risk profile, it would make a huge difference. ■

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Biological Innovation & Politics: The Future of Health Care

Dr. Craig Venter, Pioneering Scientific Researcher; President of the Center for the Advancement of Genomics; Former President and Founder of Celera Genomics

April 20, 2000

Your genome is in every one of your 100 trillion cells; that's why biology is so complex. Every one of our cells has a complete copy of our chromosomes.

Most people don't know what a genome is. Art Kaplan, the bioethicist on Celera's advisory board, was dealing with human cloning legislation in Pennsylvania and took a poll among the legislature and asked them where their genome was. A third of them said it was in their brain, another third said it was in their gonads, and the last third had no idea. It's actually in every one of your 100 trillion cells.

That's why biology is so complex. Every one of our cells has a complete copy of all our chromosomes. Those chromosomes, all the genes, all the genetic material, are defined as the genome. It has around 3.2 billion letters and the letters are four different chemical bases — A, C, G, and T. It's not hard to remember, but it presents a real problem in trying to decode it.

Nobel laureates and top scientists volunteered to help us. Every hour, they made more discoveries than they made in the rest of their careers.

Let me describe a little about the "annotation jamboree" we held for the Drosophila (fruit fly) genome project.[1] Instead of the previous 14 genomes and chromosomes that my team had sequenced and published at The Institute for Genomic Research (TIGR), where we had a dedicated team sort through them, we decided that this represented a unique situation and we brought in experts with the different gene families from around the world — people who knew receptors, ion channels, the "Methuselah" genes, and we had them literally camp out at Celera for several weeks. They worked day and night until the genome annotation was done. In some sense it was easier because there was a cohesive community around Drosophila — there are probably 6,000 researchers in the world who devote their careers to studying Drosophila and they really knew some of these families tremendously. There is no human genetics community per se — in fact, it's really a balkanized state of science because anybody who works in human genetics views everybody else in human genetics as their public enemy, something I didn't realize until I shifted from Drosophila to the human genome.

1. The annotation jamboree for the Drosophila was the search to locate the nearly 13,000 genes in the fruit fly genome.

Now we're having another major annotation jamboree, but this time with the human genome. In a way it's actually going to be easier to start because there's so much excitement. We've had Nobel laureates and top scientists from around the world calling and volunteering to help deal with their gene family of choice. In fact I think it's going to be a very exciting process that many people will follow just because it's so fascinating. We've had as many requests to participate from the press as we've had from scientists. With the Drosophila genome people got so excited because basically every hour they made more discoveries than they made in the rest of their careers. And I think that will happen with the initial annotation of the human genome.

The human genome, in fact, is going to be a lot easier because we've already done Drosophila, and while it's not very flattering — we're just about four times the equivalent of a fruit fly — the Drosophila scientists think their fruit flies are humans with wings! I think it's a key part of understanding how this information goes forward and why we study things like the Drosophila. We are a product of evolution and that's why this area is so powerful. You can take any human gene and substitute it for a Drosophila gene and it works normally. Don't worry, the experiments usually are not done in the opposite direction.

In 1991, a paper was published describing what's called the EST method, which identifies differentially expressed gene clusters along chromosomes. It was vital at the time, because we couldn't interpret the genetic code. We had little at the time, so we decided to use our cells as our supercomputer, because every one of the cells in our body knows how to read our chromosome sequences and says: "For the heart we want these genes at this time, for the brain we want those genes." EST really moved gene discovery forward. It's hard to believe that approximately 10 years ago, all we knew about medicine and science — or what we thought we knew — was based on less than 2,000 human genes. Compare this to the fact that the pharmaceutical industry today is based on only around 400.

The vista of trying to understand all of biology is dramatically expanding the overall thinking in science and in medicine. When we announced the formation of Celera in 1998, the public human genome project was lagging. A news article published around that time in *Science* magazine said it was way behind schedule and over budget and that the genome may be 10-15 years away or it may never get done at all.

A few years earlier, TIGR published the first three genomes in history using the new method we developed called the "whole genome shotgun" method. What was then the PerkinElmer Corporation, invited me to get a firsthand look at a dramatic new instrument they had developed: the first completely automated DNA sequencer. They were thinking of investing around $300 million to sequence the genome. I thought they were kidding at first, but it was immediately clear that this new technology was completely revolutionary. And that, combined with the approach that we developed, worked out so we could probably sequence the human genome in two to three years, not the 10-15 previously predicted.

To put this in context, I spent the first 10 years of my career trying to get one gene. I was working on a neurotransmitter receptor. I ended up cloning the very first one from the human brain in the mid-1980s. That's typically how biology had proceeded: Hundreds of scientists would converge on one protein, one gene. That's why we knew so few of them. The notion of getting all of them in a short period of time was an overwhelming concept to everybody. I don't think anybody actually realized, until the data started coming out, exactly how overwhelming it was.

So we formed Celera, which spun off as a tracking stock. There are now two tracking stocks: PEB and CRA, representing PE Biosystems and Celera. PE Biosystems makes the instruments and reagents and Celera was set up to be an information company on the vast amount of information that was being created. Things got going extremely well. We're well ahead of even our own very aggressive schedule. In March 2000 we published the Drosophila genome. It's the largest one that's been sequenced to date and took us less than seven months. In contrast, the second largest one took about 15 years. This just demonstrates the scale-up toward getting the human genome done.

We set up the largest sequencing factory in the world. Three hundred $300,000 machines work 24/7 to create more information in less than one year than had been created in the previous history of biology.

We set up the largest sequencing factory in the world. We have 300 of these $300,000 machines that work automatically 24 hours a day, seven days a week, creating more information in less than a year than had been created in the previous history of biology. In fact, that's the challenge in this field: handling all the data, all the information. As a process, we felt partnering with Compaq computers, the largest civilian supercomputer, would make good business sense. Our database is now over 80 terabytes. I had to learn what the next thing up from a terabyte is — it's a petabyte. Our database will be over a petabyte within a year.

The amount of data is not really publishable in the traditional sense. If you take just the sequence that we now have with the human genome and print it out in eight-point font size, filling every inch on a standard piece of paper, it would stand 100 feet taller than the Washington Monument. At a Congressional hearing, I was going to take a copy of the Drosophila genome, which is a stack of paper about five and a half feet tall, until the Congressional Committee told me that for anything you bring, you have to bring 120 copies; so we brought a stack of CD-ROMs instead. They don't yet reproduce CD-ROMs for the Congressional records, but being somewhat ecologically sensitive, I didn't want to chop down 1,000 trees just to make a point. Simply, it's a lot of information.

We announced in March 2000 that we had finished the sequencing phase of the human genome, which means we generated over 20 million sequences in approximately eight months. We're now using our supercomputer to put this information back together, lining up the sequences of all the chromosomes.

The genome sequence is not the end of anything — it's truly the beginning. It is what we had hoped to get to as the starting point at Celera. It became an end point in some

people's eyes because all of us as taxpayers had been spending billions of dollars on what was supposed to be the biggest science project in history. It required not only the might of the U.S. federal government spending about $3-$4 billion over 15-20 years, but basically every government and every major charity in the world, involving thousands of scientists over a long period of time. Purely fundamental and technological strategy changes altered that, so now with a group of 50 people, Celera has sequenced the human genome in less than a year. It's our new starting point.

Humans have 80,000 to 100,000 genes, but the pharmaceutical industry has collectively been looking at only 400. It's not surprising that we have unusual side effects, or can't predict things, or only one out of 20 drugs in clinical trials makes it to the market.

Our goal is to have fundamental knowledge. We still don't know how many human genes there are. You hear estimates of 50,000-100,000, which tells you that we don't have a very good idea right now.

More importantly, in terms of the pharmaceutical industry, it's hard to develop drugs if you don't know all the targets. As humans, we have 80,000-100,000 genes, but the entire pharmaceutical industry collectively has been looking at only 400. It's not surprising that we have unusual side effects, or can't predict things, or only one out of 20 drugs going into clinical trials makes it through to the market. Genomics has a chance to dramatically alter all of that at the time that the pharmaceutical industry has a challenge to increase their productivity threefold to fivefold just to keep their growth rates at a constant level. That's why they're constantly merging to try and maintain that level. Having all the receptors, having all the proteins, starting to understand the pathways, will for the first time allow us to know intellectually where to intervene. Having the complete repertoire of receptors that we provide to the pharmaceutical industry will allow them, before a drug ever goes into the clinic, to test it in the laboratory against every receptor and predict the side effects before they ever go in, instead of having to do random experiments.

It will take most of the 21st century to understand the genetic code we mapped in a few months. It will take 10-20 years before computers are powerful enough to model our own physiologies. Biology is very complex.

It's hard to predict physiology. This is the beginning of the era where we can use advances in computer technology to better understand fundamental biology, but that's not going to happen overnight. Some of my colleagues have promised that within 10 years, every human disease will be cured. I'm not so sanguine about that. I've been saying it's going to take most of this century to understand the genetic code that we've just determined over the last few months. It's going to be 10-20 years before we have computers powerful enough to model our own physiologies of going from a single egg and a single sperm to a 100 trillion cells. Biology is very complex and it's not part of our genetic repertoire to understand it.

Without supercomputers, the human brain is not equipped to understand its own physiology. This is a tremendous challenge. When I look at you and you look at me, I don't imagine you're thinking — gee, that's a nice set of 100 trillion cells! You don't see DNA and RNA, you see protein, and you see the results of protein interactions.

All of us differ from each other in around three million letters of our genetic code. Some are more significant than others. Probably 90% of those have no real impact, but those minor differences will affect our responses to drugs. There's a major type

two diabetes drug that was just taken off the market because roughly one in 10,000 people developed severe liver toxicity and more than 100 people died from it.

What most people don't realize is most drugs only work on 30%-50% of the population. People my age and older are told to take one baby aspirin a day to prevent heart attacks and stroke. But the caution actually only applies to one-third of the population. Just one letter change in the genetic code of one gene determines whether you're one of the three that needs an aspirin a day. As a community we say everybody should take a baby aspirin a day because it's not easy to predict who the one-third is, and the side effects of aspirin are usually pretty minor for most people. Some people have severe side effects and allergies to them, but medicine is practiced as sort of what's an an average good for the population, which may be lethal to you personally, but on average it's a great treatment. That's why individualized medicine is our ultimate goal — to help people understand their own genetic code and turn over the management of health care to the individual — not to people dealing with averages.

Most drugs only work on 30%-50% of people. Individualized medicine is our ultimate goal. We want to turn the management of health care over to the individual.

We think we can predict the genetic variants for those kinds of toxicities moving forward; so in this case a diagnostic or prognostic would determine who can take the drug. And if there is such a test and we develop one, obviously it would be mandated, because if you're going to take the drug and if you have a one in 10,000 chance it could kill you, you'd certainly like to know before you take it, because there are alternatives. Diagnostics and prognostics are going to go along with the therapeutics in a simultaneous fashion. They're going to determine which of us should get what drugs.

With genetic variation happening so fast, the diagnostic and the therapeutic will come together simultaneously.

One of our main purposes of having human genetic code is to enable the field called proteomics to explode. There's some very exciting new technology coming from our sister company, PE Biosystems. We're building a facility to sequence a million proteins a day. If there are 80,000-100,000 genes, then each of us has about a million proteins. They're not all predictable from the genetic code. We have alternate splicing. A simple example is the insulin gene. The insulin gene makes a large protein that is cleaved by proteases in the body to create four separate proteins. Two of those come back together to form the insulin molecule. The other two were thought, for the last couple of decades, to be waste products, but recent studies in Stockholm have shown that these are actually hormones themselves. One gene has yielded four proteins and three hormones. Thus far we don't know how to predict that from a genetic code, but having a genetic code allows us to comprehensively measure proteins for the first time.

Another example is the struggle to understand metastatic cancer. We've constantly been asked if we can sequence all the genes in metastatic breast cancer versus the normal tumor versus normal tissue. The answer is yes, you can do that, but it doesn't really tell you anything. In the facility we're setting up, however, we're going to be able, in a matter of hours, to sequence all the proteins in a metastatic tumor and understand what's different with that expression. We'll be able to feed that pathway information to the pharmaceutical industry to know where to intervene to try and actually do something about cancer. With breast cancer, there's been no fundamental

change in the survival rates in the last three decades. This information, understanding the complexity of cellular physiology, is our first real chance to try and understand and intervene with cancer.

Straight-out diagnostics of disease states was the paradigm as so-called genes associated with genetic diseases were found — that was the first step with Huntington's disease. We didn't understand what the gene does; we didn't understand how to intervene. Now with genetic variation happening so fast, the diagnostic and the therapeutic will come together simultaneously. In fact, it's one of the biggest concerns that pharmaceutical companies have with these new targets.

A key part of our proteomics endeavor is that we're going to make an effort to have antibodies made for every human protein. Right now, there are chip companies attempting to measure RNA. Why do we measure RNA? Because we can and because it's what we want to measure. In each cell, DNA is the template — we make copies called messenger RNA that determine which proteins are expressed in that cell. But with RNA, the rules change for every gene, every protein, and every cell. We don't know how much protein is made from RNA. Measuring RNA gives us a very crude measure, but what we want to know directly is what happens with the protein. So we're going to build protein chips from these antibodies that essentially will allow us to instantaneously measure protein expression in different diseases and different physiological conditions. Imagine the complexity of this information as we construct this network of a million proteins a day, with different conditions being built across the complete genetic code.

What we envision within a few years — having maybe 100 petabytes of data — gets back to our basic goal as an information company. Nobody is equipped to handle this information. Ours is a roughly $100 million computer facility. The pharmaceutical industry can't afford to build such facilities for analyzing the genome. We have to scale it up tenfold now to deal with proteomics. We bought Paracel Computing because they do custom-designed computer chips. Every time you make an overseas phone call, a Paracel computer is being used by the National Security Agency on your telephone intercepts to work out whether you're talking about terrorist activities or not. These computers are the ones we'll use to interpret rapidly the genetic code, all the literature, and all the information. Deciphering this information is almost beyond all of our imaginations. That's why we feel pretty positive about building Celera as an information company. We know that anybody trying to develop and understand biology will need this kind of computing, this kind of information.

Our plan from the beginning was to publish the complete human genome when it was finished. The question I used to get, including from the CEO of the parent company, was, "Tell me again how you're going to take our $300 million, you're going to sequence the human genome, you're going to give it away for free, and we're going to make money?" He doesn't ask that question any more. Driving this information out there is beyond what anybody can use in any reasonable fashion. Our initial

model was that we would get to the starting line, build this database, and then start to offer it commercially. Some early movers in the pharmaceutical industry recognized how critical this data was and how it could change what they do. Amgen, for example, signed up for a database subscription before we had our first sequence recorder, based on the reputation of my team and what they figured we would deliver. Our basic subscription is $25 million locked in over five years. Most of them are much more than that. We have more than $200 million in committed revenue that people can't back out of over a five-year period. Just as we're getting to the starting line, we're still working out our business model in terms of constant expansion — we're in discussion with a large number of biotech companies and universities. People realize how critical this is.

A physicist said I was playing a cruel hoax on people because I knew they couldn't possibly use the information. It's not a hoax — we're trying to drive the information revolution. We gave away the Drosophila genome on a CD-ROM. It's one-twentieth the size of the human genome and it crashed most scientists' computers. They think, well, it's only 120 million letters and I have a five-gigabyte hard drive; it's no big deal. But there are tremendous differences between what our computers can actually deal with and what most people can use in an intelligent fashion.

People have much bigger computing problems in the sense of data storage than genomics and biology does. Banks have huge storage problems and retrieval problems, and your bank account doesn't have to relate to mine. The difference about genomics is that we have to relate every single bit of information to every other bit of information. So we think by putting this information out, it's going to increase the demand for the software, the computing services, and our interpretation, because the amount of data in this field is already overwhelming anything that's ever happened in any other field.

Bloomberg has, I think, over a billion dollars a year revenue from their databasing and information services. It's not from having secret proprietary information; it's from having useful tools that help people to retrieve information very quickly and help them understand it quickly. That's going to be an even bigger challenge in our field. We see a constant expansion of our subscription base.

Proteomics research will lead to cancer vaccines.

Trying to deliver this vast amount of data over the Internet is our critical base. We're fundamentally an Internet company. We're delivering all the information to the pharmaceutical companies over virtual private networks. Some of them didn't even understand this issue early on. One of them, halfway through the first year, decided they would like faster searches and thought they could do them faster on their own computers. One company tried to download the database over their high-speed direct link. Six days later they screamed for us to shut off the computer. They only got 10% through it and it was clogging their system; they had no idea of the size and complexity of it. So as more and more people need to understand this information, our model will expand tremendously.

The proteomics side is going to lead, we think, to direct cancer vaccines. The information we're generating is going to lead to new diagnostics, new ways to look at medicine. If we can sequence a million proteins a day, we will be adding to the complexity of medicine, but at the same time simplifying it because we get down to what is really changing with disease, and at the same time providing a target to attack it. It's all about information and its products, hopefully cancer vaccines. We haven't even talked about the agricultural side — we could describe the genetics of what you eat for breakfast.

In the protein area we're going to be developing both products and database subscriptions. Our goal is not to become a direct pharmaceutical company. That's the classic biotech model, where you drag things out for 10 or 15 years, promising that someday you'll have a billion dollar drug. With key new hormones that we discover, we will patent them and we will license them to the pharmaceutical industry, hopefully for very favorable terms to Celera with long-term royalties.

We have a pre-existing agreement with Amgen for genes that we discover, so any one that they take into their programs would pay us tens of millions of dollars in milestones and nice royalties if it becomes an actual product. But the protein area will yield this much faster. Here lies important diagnostics or markers — the example I often use is colon cancer. About five years ago, along with Bert Vogelstein,[2] we discovered three new genes that cause colon cancer. This is part of the personalized medicine repertoire to understand your own genetic code; we can now predict whether you have a greatly increased chance of getting colon cancer. Instead of that being bad news, it's good news because it gives you control over your life. Right now, you're told at age 50 to go get your first colonoscopy. But if you know you have an increased risk of getting colon cancer, you don't wait until age 50 for a colonoscopy, because colon cancer is essentially 100% treatable or curable if it's caught early enough. This is where proteomics is going to come in handy and we have hopes that it will replace the colonoscopy, so it will be even more favorably received.

We discovered three new genes that cause colon cancer. Now we can predict the chance of an individual getting colon cancer with much greater certainty. This is good news; each of us gains more control over our life.

If we find protein expression changes, we hope to come up with prostate-specific antigen (PSA) equivalents for colon cancer and for other diseases. If you know you have an increased risk, then you get this blood test more often, like you do PSA tests. Proteomics will lead to new and better diagnostics, predictors, and direct therapeutics. Probably the biggest growth area in the pharmaceutical industry is going to be vaccines and personalized vaccines. It has been a slow area to build because the protein sequences in all of us are subtly different. Snips (SNP = single nucleotide polymorphisms) may play an important role in further study of genetic variations. And that's where personalized vaccines come in. We could have instantaneous vaccines that may not work for anybody else, but would work on your particular tumor. We are driving in that direction, but the information part of the business is also very essential.

HGS and Insight built their models on secrecy. If you wanted to see what they had, you had to buy in. And I guess that was why there was some doubt whether we would publish our data in the first place. Our model is that we will drive far more in this

2. Bert Vogelstein is a Professor at the Johns Hopkins School of Medicine.

field by having the data out there. Anybody else generating human genomic data only helps our situation, doesn't hurt it. But if you are a company that had a proprietary database on DNA sequencing, by the end of this year that database will have no value based on both the Celera effort and the public effort. Our view is the faster people generate data and put it out, the more demand it will create for our kinds of interpretation and computational capabilities. So not only does it not pose a threat, it's helped us tremendously and it's helped take even a year off our aggressive schedule.

The issue of intellectual property in the sector is looming large, unfortunately with little understanding and much confusion. The world ought to proceed on the concept that gene sequences without function attached are not patented, and I wish that were true. Some companies are downloading public data from the Internet every night, doing a quick computer search and filing patents. Most people realize it's an abuse of the patent system and so these companies that have based everything on their intellectual property portfolio will end up losing. If issued patents have the word "like" in the title, it means the company has no idea what the function is. An "insulin-like" gene just means it was the closest match in the database to the insulin molecule. Most of the patent portfolios at HGS and Insight have the word "like" in the title of each application. That's what people object to and Celera is in total agreement with the National Institutes of Health that patents should be screened and that the function and the application are known. Most people in the pharmaceutical industry don't want these early patents. The Amgens of the world think it's the worst possible thing because if a patent line is shortened because some company is just trying to do early speculative patenting, it actually hurts the patent life they have for a real drug. There are companies really trying to abuse the system, but I think that as there was a so-called correction in the market, there will be an even bigger correction in patent law in the near future.

Some companies are changing their names to genomics just to try to get on the bandwagon. The lack of sophistication in some of the investing is disturbing to people like myself who know what some of these companies have and what they don't have. There are some that were close to going out of business that went up tenfold in market capitalization riding this wave up and down because they were proven not to have anything for a time. A consolidation is just about guaranteed. One hundred or so companies were getting ready to do IPOs, some need money desperately and they'll have trouble getting that money, so some will go out of business; there are always mergers taking place in this area. Celera is in a strong position for a company that's 18 months old. We have a good currency despite the sharp ups and downs and we have the capital in the bank. We have more than $1 billion in cash in the bank to build the next phase of what we're doing. We don't want to be a consolidator for the sake of consolidation — we are trying to build our platforms in a rapid, rational fashion. Like any other group, now we're making buy versus build decisions and trying to do that in a rational fashion.

I think that in terms of biotechnology, concerns about over-regulation are based on fear regarding human cloning and people not understanding what that was or

With stronger privacy legislation, the results of a genetic test cannot be used against you. This information has tremendous power if owned by the individual.

whether it was even serious. I don't think there's that much in the way of regulation right now — some is not bad. I certainly have privacy concerns myself. Our goal as we genotype people is that there's only one source that should own the information. If we genotype you, you should be the only one that has the key to that information. That's not the way the rules work right now. If you've recently applied for life or health insurance, there are these little clauses at the bottom of the page that say even if you've paid for the information yourself, any information you have about your own health must be provided to your insurance company. We're urging stronger legislation in the privacy area so that it can't be mandated that if you have a genetic test done, that the information can be used against you. It has tremendous power if you own it. We don't want large government databases of our genetic codes. I don't think we want large databases of private companies with the genetic code. Each individual should have the information and use it in conjunction with his or her physicians. But it's not hard to come up with HMO scenarios of people wanting to misuse the information to ration out health care. It's an area where we do have to be cautious. My biggest concern is that if privacy abuse comes into the health care arena and people are discriminated against based on their genetic information, then we'll all lose.

It is impossible to forecast a breakthrough in cancer research. The breakthrough could come tomorrow or it could take 30 years. The one certainty is that it's coming.

Things are changing very rapidly. I'm supposedly a good foreseer of the future, but quite honestly — if you'd asked me 24 months ago, could we possibly be where we are today, I would have told you no, there's very little chance of that. We're in one of those rare moments in history where things are changing at such an exponential pace; it's very difficult to predict the timeline for this. I'm fairly certain what will happen in the future, but I can't predict the time for it. I'm certain that in the not-too-distant future, before babies leave the hospital, their parents will have a DVD or whatever the media is at the time with their child's genetic code — to predict their future health and determine which drugs they can have and which they can't, which diseases they'll be susceptible to and which ones they won't. I can't tell you whether that's going to be in five or 15 years from now. If anything, we can probably expect that any timeline that people have now will move up a lot faster, except the things that involve fundamental, basic discovery. Really trying to understand how cancer works is impossible to predict. The breakthrough information could come tomorrow; it could take the next 30 years. There's real uncertainty with this. The one certain thing is that it's coming. ■

Dr. Craig Venter, PhD, is regarded as one of leading scientists of the 21st century for his invaluable contributions in genomic research. He is founder and president of the Venter Institute and the J. Craig Venter Science Foundation, not-for-profit, research and support organizations dedicated to human genomic research, to exploration of social and ethical issues in genomics, and to seeking alternative energy solutions through microbial sources.

He is the founder and former president of Celera Genomics, whose research involved sequencing the human genome. The successful completion of this research culminated with the publication of the human genome in February 2001 in Science. *In addition to the human genome, Dr. Venter and his team at Celera sequenced the fruit fly, mouse, and rat genomes.*

Previously, Dr. Venter was a founder and former president of The Institute for Genomic Research (TIGR), a nonprofit genomics institution. There, he and his team decoded the genome of the first free-living organism, the bacterium Haemophilus influenzae, using his new whole genome shotgun technique.

Dr. Venter and his team at the Venter Institute continue to blaze new trails in genomics research and have recently published several important papers outlining advances such as: environmental genomics through the characterization of more than one million new genes found from shotgun sequencing of the Sargasso Sea; synthetic biology with publication of the synthetic PhiX 174 research; and the sequence and analysis of the dog genome.

Dr. Venter is the author of more than 200 research articles and is the recipient of numerous honorary degrees and scientific awards, including the 2002 Gairdner Foundation International Award, and the 2001 Paul Ehrlich and Ludwig Darmstaedter Prize. Dr. Venter is a member of numerous prestigious scientific organizations including the National Academy of Sciences, the American Academy of Arts and Sciences, and The American Society for Microbiology.

Dr. Venter began his formal education after a tour of duty in Vietnam from 1967 to 1968. After earning a bachelor's degree in biochemistry and a PhD in Physiology and Pharmacology, both from the University of California at San Diego, he was a professor at the State University of New York at Buffalo and the Roswell Park Cancer Institute.

Global Macro Strategies

Ray Dalio, Bridgewater Associates, Inc.

January 15, 2004

The key to successful investing is finding 15 good, uncorrelated return streams. Diverse return streams reduce your risk by 80%. Diversity increases the consistency of your returns.

I don't want to be part of the generalization of the whole global macro environment as a few big bets, leveraged up on the macro economic outlook. Bridgewater is configured with about 60% related to a macro economic outlook and 40% to everything we think will work. I think we all manage money in one form or another in order to create return streams. And the best way to create return streams is to invest where you have your core competency. We have some core competency in big, liquid markets, as well as other markets.

Bridgewater was founded 28 years ago and we've always managed money for institutions. About 14 years ago we put together a hedge fund product to take all of the best bets and organize them in the best possible way. We manage approximately $8 billion under this highly diversified strategy. We look at the global macro topic from the perspective of dealing with institutions, and what's going on there is interesting and will affect flow.

I believe making big, concentrated bets in anything — like taking an arbitrage strategy bet and leveraging it up — can't ever be good enough in any limited number of bets not to run into serious trouble.

I suspect the direction is probably changing; certainly the hedge fund world is evolving. It's interesting that there are now these recognizable categories of investments. The average correlation of the managers of each one of these styles has a correlation of something like .50 to .60 to the average of other managers in that style. What that fairly high intra-manager correlation means is, rather than producing alpha for the most part, core return is a systematic bias, a beta of some form that is not alpha. That represents a problem.

The key to successful investing is to have 15 or more good, uncorrelated return streams. That's what we're all after. With 15 or more good, uncorrelated return streams, risk is reduced by about 80% and that means the information ratio, or Sharpe ratio, or risk-to-return ratio, increases by a factor of five. There's nothing that can be done, in making any single decision that much better, to get an information ratio of a factor five. When institutional investors think about structuring their portfolio, they will be driven — in order to get a certain good return — to as many good, uncorrelated return streams as possible.

Institutions are learning this lesson now because they had a concentration in equities — typically 70% of their assets and about 95% of their risk. Institutions

are looking for good, high-returning, uncorrelated revenue streams, including leverage. With interest rates what they are, they're unable to deliver adequate returns. As a consequence, money is coming into hedge funds from institutions at a very fast rate.

Another thing that's happening is a separation between alpha and beta. So hedge funds may be thought of as an asset class. The way to think about investing is that there are asset classes we'll call betas, such as stocks as an asset class and bonds as an asset class. These can be invested in passively, producing a certain kind of return stream without active management.

Good hedge funds are nothing more than portable alphas.

Alphas that are value-added will produce a different return stream. When constructing a portfolio of alphas and betas — a mix of certain amounts in an asset class and certain amounts in an alpha — that portfolio will be just a weighted average of those mixes and decisions. But alphas and betas are very different. So where there used to be investment in an asset class — where we'd decide to invest in equities and give it to an equity manager to make money — that slice of the pie would be equities and equity managers with alpha and beta together. We're changing the way we're investing so that there are portfolios of alphas and portfolios of betas or asset classes.

Now portable alpha and hedge funds are competing and will evolve to compete further. A hedge fund is nothing more than alphas mixed with some betas. In other words, they have systematic biases — otherwise, those high correlations within asset classes wouldn't exist. Systematic biases exist subject to a certain environment.

Two worlds are coming together to create one world of alpha producers. People in the hedge fund world are pretty much leveraging alpha. More engineering is occurring by taking an alpha that's produced by a traditional manager, hedging away that manager's exposure, applying leverage, and gearing that up. It's the way money is managed. The alpha overlay on the hedge fund causes investors to look for managers who can produce alpha. The goal is to separate alpha and beta.

How a manager chooses to go about separating alpha and beta is really up to him. I think it's just return streams. There's nothing very fundamentally different in global macro in other than those general rules.

All value-added is a zero-sum game. For a manager to add alpha, he must take alpha away from another manager. The smart manager will take money away from the dumb.

Global macro used to be portrayed as the cowboy or gunslinger who would come in and say, "Oh, bet on this and bet on that and have a few bets." And no bet can ever be good enough that it's going to produce a high enough information ratio that you're not going to get in trouble, so you need diversification.

When thinking about how to produce that, remember, all value-added is zero-sum. A manager adding value takes it away from another manager. That's very different from beta. With beta, investing in stocks in a standard way creates an excess return relative to cash. There will be an excess return with a low information ratio. To invest in alpha, it is necessary to pick the right alpha. What it really comes down to, in all forms of alpha, is that the smart will take money away from the dumb, as in any business.

So we concentrate. We need to focus in order to compete in this game. It's like competing in the Olympics. Actually, it's more difficult than competing in the Olympics since here everybody has an opinion. To compete effectively, you have to focus. For 28 years we have chosen to focus on the credit and currency markets and we've created uncorrelated bets.

Uncorrelated bets are structured by taking a lot of spreads. That's by and large what we do. In looking at managers and at global macro, a little bit of a macro view is needed because the average hedge fund manager within an asset class is .50 to .60 correlated with other managers in that asset class or style. Return streams can be plotted for each asset class. And each return stream for each asset class follows something that's very closely related to an underlying bias, an underlying beta. For example, the average return streams of merger/arbitrage managers, replicated by just taking all the mergers and going long those that are being acquired and short those that are acquiring — those spreads, those return streams plotted on top of each other — are identical.

A group of hedge funds has their own inherent beta. Most practitioners of a given strategy tend to track each other based on the opportunities available to all. If an idea is predictable, like an announced merger, then it's a problem. Look for managers with unique insights.

They're also identical for emerging market debt managers and the credit spreads of emerging market debt plotted on top of each other. This means many decisions are being driven by what will determine whether a merger or arbitrage goes through and becomes a good strategy. In an environment in which the deal falls apart, then it will be taken out. In an environment where the deal comes together, then it will be good.

There are many systematic biases reflected in marketplaces that are not alphas. Over a period of time they may have a little bit of an excess return, but they'll be driven by the characteristics of the environment. Almost all strategies will be influenced by environmental characteristics, which is why it is essential to know something about the characteristics of the environment. From an engineering point of view, it is necessary to separate alpha and beta.

Our mission is to have, in one form or another — in our case we try to have literally 150 or more — different uncorrelated return streams that come from alphas so there's no concentrated risk and no leverage required.

There are too many systematic biases. From an engineering standpoint, alpha must be separated from beta.

If the opportunity set in global macro strategies is predictable, it's a problem. The notion of taking predictable return streams that have high correlation means not having zero-sum; there's no insight. That will create a bet on whatever is driving that correlated return stream, making a macro bet. Success is dependent on your talent in coming up with the structure to make that macro bet. When thinking about where to invest money in hedge funds, wanting a certain amount in one style and a certain amount in another style, and you benchmark against that style, you need to ascertain if consistency can be obtained.

There shouldn't be expectations. You want managers who have a lot of different insights. Something I'm doing should not resemble anything they're doing. Why should our insights have any correlation? Why should we have any bias? We shouldn't. If we do, then our returns are all biased, not our insights.

Our goal in all cases is to deliver the highest information ratio. In other words, what we all do is produce a certain return for assuming a certain amount of risk. If I can cut my return in half, I can also choose to be more aggressive and then convert that to a higher amount of return. My goal is the most return for a unit of risk that I'm comfortable with. That's what I mean by information ratio. If I have diversification and a lack of bias, I can have a greater amount of consistency. Our return-to-risk ratio is about 0.35 — a unit of return for a standard deviation unit of risk in any one of our bets. My portfolio over the last 14 years has had an information ratio of 1.4 only because I have had diversification of bets.

Diversification makes the return more predictable. And predictability is measured by the information ratio. For example, if you want to be 80% or 85% sure that you won't lose money in less than three years, you need an information ratio above 0.9. The information ratio will give comfort — it is the reflection of predictability. It will be one number that would be the measure of what the chances are of losing money in any particular period. ■

Raymond T. Dalio is President and Chief Investment Officer of Bridgewater Associates, which manages $55 billion and is one of the largest institutional hedge fund managers. Since he graduated with an MBA in finance from Harvard Business School in 1973, Mr. Dalio has been dealing in currencies and credit markets. In May 1973, he was Director of Commodities at Dominick & Dominick, a Wall Street brokerage house. In 1974, he joined Shearson Haydon Stone (now Lehman Brothers) where he was in charge of the Institutional Futures department. In 1975, he left Shearson to form Bridgewater Associates.

Global Macro Strategies

Renee Haugerud, Galtere International Fund

January 15, 2004

Global macro is a thought process. In today's world of greater globalization and synchronicity, all assets are interrelated. The global macro manager must interpret the impact on many different markets.

"If only I had known," is a phrase that has everything and nothing to do with global macro, about which I would like to address three major issues. One: Why global macro and why commodities? Galtere is a hybrid commodity global macro fund. Two: What is Galtere's methodology with this global macro commodity hybrid? What enables us to capitalize on the macro economic trends and dislocations? Three: What are our current market views?

I would like to emphasize that global macro is not just an investment strategy. Far from it. More importantly, it's a thought process in today's world of increasing globalization and economic synchronicity. It is incumbent upon all asset managers — whether trading with equities, bonds, real estate, or commodities — to understand the impact of global events and the interrelationships of all asset classes on market motivation and momentum. I think the important part is your style, whatever it may be. I'm more gradual, and I like to scale in and scale out with the value. I stick to my style and examine just what my moves are going to do in the short term. It doesn't change the big-picture economic analysis — just the timing.

Early in 2002, commodities emerged from a 20-year bear market. Supply shortages are increasing due to unforeseen events and surging demand, notably the explosive Chinese economy.

Why commodities if they were derailed in late 2000, in 2001 because of 9/11, and again in early 2002? Commodities as an asset class have left their two-decade malaise far behind them. Our belief is that only an investment approach which is truly global in its scope and truly all-encompassing in its armory of investment vehicles will equip the sophisticated investor with the tools she or he needs to take on the challenge of tomorrow's financial markets.

Increasingly, the global economic environment is becoming characterized by supply shortages due to unforeseen events and surges in demand from important new players in world commodity markets. While weather patterns, conflicts, and political dislocations have always been with us, the advent of new demand from the explosive Chinese economy, for example, has upset the balance of a number of markets in a more permanent way.

What's our methodology? How do we profitably traverse the global landscape? As the philosopher and mathematician Alfred North Whitehead once quipped, "We think in generalities, but we live in the details." As a group we are a far cry from the past history of the global macro gunslinger — the individual manager searching for alpha and staying true to his or her style is imperative.

Very simply, we capitalize at Galtere. Our style of trading is to capitalize on the best

of both the discretionary and systematic world, so to speak. Our theme-based methodology combines discretionary fundamental analysis to determine portfolio composition and direction with two rigorous nondiscretionary systems of value pricing, entry, exit, and risk of all investments or trades.

How specifically do we accomplish this? Our investment approach begins with a global overview, a snapshot of the world encompassing an assessment of the broadest range of factors from geopolitics to weather patterns, from interest rates and asset prices to demographics and trade agreements.

Following from the top-down overview, a series of themes is identified and evaluated. The fund ultimately takes positions in three to five themes at any given time and five to 15 investments within each theme, where we look for 15 different uncorrelated revenue streams.

Examples of current themes in Galtere's approach are commodities from a supply and demand scenario, precious metals, the free trade area of the Americas' economic convergence, and an economic theory that I've referred to as inverse stagflation. In addition, we selectively participate in special events with particular investment potential. Again, this is trading around our core position, trading against our long-term views. Basically, we're willing to take shorter term trades that may go against our core positions to further enhance our deals or revenue streams.

Examples from the past include a Japanese monetary policy deflation with the potential for reflationary action by the Bank of Japan or devaluation of the yen or the zero interest rate policy that Japan recently pushed out to the 10-year area. Of course, now with the bond market moves, that has changed. But it was a very special situation and we were able to identify it coming.

Our precious metals theme noted that global supply and demand forces started contracting as early as 1999 and continues today with the short carry trade and safe haven currency aspects of gold adding fuel to the price fire.

Once these themes have been identified, and appropriate asset classes and investments within asset classes have been selected, our strategy turns to the identification of systematic technical value zones for entry and exit. Each position is initiated using a proprietary technical system which I've developed over the past two decades of trading. Once established, the positions are then subjected to a rigorous risk management system using fixed percentage levels to control losses, both with respect to individual trades and by theme. These are the details.

The generalities, in raconteur terms, are easy. We build three to five silos that we fill up with five to 15 different investments, trade around the core position, and then empty the silo to make way for the next opportunity.

Now to the fun part. What are we looking for in 2004? Basically, we still see that

global macro is definitely on the rise and will play an increasingly important role across all asset classes. Equities alone in the near term, and possibly even long term, cannot play the role they have played in the past. Investors who stay in equities alone, because of past performance, and who use 1993-2000 — the seven years of plenty — as their benchmark, may be in for a rude awakening.

Our proprietary technical system, which does not signify or trigger composition or direction — if we look at the equities as an asset class — is signaling a short-term overvaluation. Whether this is just a bump in the last year's rally or a top is yet to be seen. Again, diversifying among equities alone will not yield as positive a return as diversifying among the asset classes and themes.

In 2004, global macro is on the rise. Equities are overvalued and will not repeat their recent performance. Investors should diversify across asset classes, not across equities.

Investment in selective commodities and global macro themes represent the best opportunity for capturing value, both from the long and the short side. We like to think about the basics; what makes sense; the real things — food, agricultural products, grain, gold, natural gas, and even farmland.

With the recent mad cow outbreak, the import bans are going to last a little bit longer than people expect so this is one area of commodities that has come down. It's significantly off its highs, and rallies should be sold for the time being. This is one area to offset the overall bullish nature of our commodity view.

The free trade area convergence of North American economies will continue. It's much like what happened in Europe in 1994. It will just take longer to happen and be more selective. The carry that you have to play to be long the dollar against many of these currencies is negative; to be short the dollar and to be long these currencies gives you a good cushion to take that view on convergence.

Inverse stagflation and the weight of money theory, we believe, will cap mid-term interest rates. Even though we are entering an inflationary period, and with current account deficits and budget deficits exacerbating that, we believe the weight of money theory, with demographics, yields in 5-10 year or 7-10 year area will be 4.5%-5% and represent good value. However, stay out of the long end, as with current deficits and ballooning spending programs, the 10s-30s curve should steepen even further. While we don't see the Fed raising rates anytime soon — within the next couple of quarters — when inflation and/or employment levels pick up, we think the bulk of the rate increases will come in the shape of a yield curve change — more V-shaped or backward L-shaped, with the midcurve rates possibly even capped below the rate of inflation if inflation rates accelerate in the extreme. I would look for the yield curve to change and possibly to get in a V with the short-term rates coming up even if inflation does peek through and the longer term risks of longer term rates go up. That's my perspective.

In short, the time has come for a new mindset for global investment thought leaders. The markets of the past year have borne out the resurgent potential of commodities and the reinforcing power of correctly tailored currency and interest rate exposures.

The global macro investor is in the right markets to shoot the right instruments.

A lot of commodity trading advisors (CTAs) in managed futures programs trade commodities with a momentum-based approach. I think that a value aspect is a more robust approach. Basically, what I try to do is extrapolate the global financial trading and the commodity trading off the cash-grain trading I started out doing. Every trade, every theme is a silo. When you're filling a silo, obviously when you're calling the elevators, you have an empty silo and when the silo is empty, you're paying the highest price. As you fill up the silo, you satiate your demand and buy on a scale-down. When you're emptying the silo, you sell on a scale-up. This is contrary to the CTAs who basically are buying and selling momentum, only after the trend is confirmed. When you're looking for a global macro manager, you look at their trades as well. Those trades should be uncorrelated and nonbenchmarked.

This must be done within a rigorous risk management system program in a systematic way, and that's how we operate. We decide the composition and direction, but we are able to buy what we really want to — it doesn't really matter what the direction is, if you buy it wrong, even if it goes up. We've all seen two managers be long at the same time or short at the same time and both lose money or both make money. We want to buy at $1 and sell at $4. We've basically utilized the system within these technical values on the systematic structure to buy within that range on a buy on a scale-down and sell on a scale-up, which is the value aspect rather than momentum.

The opportunity set in global macro strategies is somewhat predictable. In some investment strategies — merger arbitrage, for example — you can look for a beta and see the kinds of deals, the quality of deals, and the spreads of deals. You can come to a conclusion of what you think the return streams ought to look like. There can be some consistent expectations for predicting the opportunity set. It may change a bit as regimes change with bear and bull markets, but it's probably pretty stable.

Diversification is one of the keys to avoiding some threats in an overcrowded situation. The gradual scaling in and out is also very important. Given the amount of leverage that occurs when the momentum players jump on a move, supply and demand of supply and demand is an extremely important aspect. It's like options on optionality. In fact, we used to just do all of our S&P 500 analysis and all of our macroeconomic and micro analysis but now a portion of that analysis is the supply and demand of the supply and demand. If you go to 10 foreign exchange dealers, 10 out of 10 are one way on a currency; I don't think it's ever gone the other way. Nine out of 10 doesn't work; eight out of 10 doesn't work, but 10 out of 10 — any 10 banks — always works. But if it changes in a day, then of course your little correction is over. Also, on commodities, the raging bullish aspect of commodities — and we've been pretty bullish for two or three years — now seems to be a little bit overdone, where the supply and demand of supply and demand could affect a shorter term correction. I've recently had five people ask me to run a long-only commodities fund, where three years ago, when I would have loved to do that, there was zero interest.

The current environment is extremely inflationary — with our account deficit and our budget deficit and the fiscal situation that we have in the U.S., 87% of world savings are needed to finance our bond market. It's really about timing and demographics. That's part of what I call inverse stagflation — we're in this odd situation which is the reverse of the early 1980s where there was massive borrowing. Now the demographics of the whole world are basically in this massive saving situation. With an aging population, there's a whole bulge of the demographics seeking yield. The low interest rate environment is fed by productivity gains and deflationary aspects. The upshot of it is that money is like grain of the 1980s — it can be had, at a price.

Now we have these elevators and silos of money all around the world that had 10 years of government supplies of grain. The interest rate scenario is going to affect the shape of the yield curve probably more than an absolute spike — and to me it's clearly in the long end, because the weight of money still before the global population is in retirement. The caveat is, if equity markets keep going up, that weight of money isn't going to be as dramatic, but if the equity market is sideways to down for the next five or 10 years, then that mid-area of the curve could be rates capped under the rate of inflation, in which case TIPS could be fantastic. Because with interest rates that really stay stable, you won't lose money on your principal but you'll gain the inflation-adjusted aspect. ■

Renee Haugerud is the Founder, Managing Director, Shareholder and Principal of Galtere Ltd. Prior to founding Galtere, Ms. Haugerud served as the Financial Trading Manager for Hunter Douglas N.A. from 1997 to 1998. She also spent two years in Hong Kong with Natwest Markets Asian headquarters as the Head of Proprietary Trading for Global Financial Markets. Ms. Haugerud acted as Fund Manager to GPM, a macro hedge fund, from 1994 to 1996.

Ms. Haugerud began her long tenure in financial markets by trading cash commodities for Cargill and Continental Grain. From 1980 to 1994 she held various top management and trading positions for Cargill, Inc. Her interest in the relationship between financial markets and politics led her to an international post in Geneva where she ultimately served as Cargill's Foreign Exchange Trading Manager from 1985 to 1987. Ms. Haugerud returned to the U.S. in 1987 where she assumed the position of Manager of the U.S. Fixed Income Trading Desks. Having developed expertise in a broad and diverse range of securities, Cargill transferred Ms. Haugerud to their Melbourne, Australia office in 1989 as the Financial Division Manager and a member of the Board of Directors at Cargill Australia. Following her assignment in Melbourne, Ms. Haugerud was appointed Vice-President/Structural Trading Manager at Cargill's corporate headquarters in Minneapolis.

Ms. Haugerud received a BS degree with Honors in Forest Resource Management from the University of Montana in 1980. She's active in the community of women and business leaders, and a founding member of the Eleanor Roosevelt Legacy Project.

Global Macro Strategies

Dan Tapiero, DTAP Capital Advisors

January 15, 2004

Although I have more experience as a hedge fund manager than as an investor in different funds, having worked for some of the best in the business like Julian Robertson and Michael Steinhardt and Steve Cohen, I've seen enough variation in money management styles to have a sense as to what investors should be looking for in a good global macro hedge fund manager.

Anomalous Viewpoint

Everything begins with the anomalous viewpoint. Can your manager find an idea that is not commonly known? What does he know that the market has not already discounted?

From my perspective, everything begins with the anomalous viewpoint. Can your prospective manager come up with something that is not commonly understood or known? Steinhardt used to call this the variant perception. He used to say to me, "What do you know, Dan, that the rest of the world does not? Where is your edge?" These are different ways of saying: how is your idea not currently discounted by the market? What piece of data, what thought, what world view do you have that gives you the comfort to hold a long or short position in whatever market?

Deep macro analytical research is usually the only way to come up with something original. The more work one does, the better the results. I've never known a lazy successful macro hedge fund manager. An original idea that can serve as the cornerstone of a bet can come from anywhere. The idea can be sparked by a piece of economic data, by a chart or technical pattern, by an expectation of a geopolitical shift, or a combination of these three things, or something else entirely. The idea usually emanates from something that surprises — from some data point that you think seems to say something different about the world than is currently discounted by that market. Once one has some faith in the anomalous idea, it serves as a bedrock for a medium-term macro fundamental view, which for me is a three- to six-month view, in some cases the view can be as long as a year.

Be careful with choosing global macro managers who only talk about ideas – the pontificators. They are more interested in the idea than the return on capital. Ideas, while seductive, are only tools to extract profits.

However, after you have done all this work to come up with your idea, it is important to realize that it does not have any value in and of itself. One thing to watch out for when choosing a macro hedge fund manager is the person who *only* talks about ideas. The pontificators will get you into trouble, because their interest in the process is the idea rather than the return on capital. It's important to sense that a manager sees the idea as an aid in helping to purchase something at $1 to sell at $4.

In the macro game, ideas can be very seductive because they can be so all-encompassing and universal. The seduction of the idea can lead a manager to hold

positions through treacherous volatility, and in some unfortunate cases — we all remember 1994 — force some managers into positions where their businesses are compromised.

Catalyst

Once one has arrived at a place where one has faith in one's anomalous macro view, it is imperative that the manager has some catalyst for the market to act upon. This is so important because without some catalyst, the macro manager can sit waiting for months and sometimes years for a position to play out. This is certainly no way to optimize return on capital and will spread the energies too thin.

As I said before, the idea is only relevant in that it helps you buy at $1 and sell at $4. Similarly, the idea itself can only be transmitted into a financial position after one can foresee a set of data points or events coming up in the near future — anywhere from one to two months or sooner, for instance — that will force the market to see what you are currently envisioning.

The idea needs a catalyst that will force the market to see it in the next 1 to 2 months. If the macro manager has an idea but no near-term catalyst, he is not on top of his game.

If a macro manager tells you he or she has ideas but no near-term catalyst, this should also be a warning flag that they aren't on top of their game in the way they should be. You don't want your macro manager to be like some of the Gold Bug managers who sat with a long gold position in 1997 at $350, saying the market is going to $400 — a correct assessment in retrospect that took six years to play out. That's not a good way to maximize return.

So far we have an anomalous view and a catalyst with a specified time horizon and an expectation for the payoff. However, all of this ends up being irrelevant to the money-making process if the manager does not have a very well defined risk management process, whereby each trade in the portfolio has specifically set risk parameters and performance expectations over time. The risk management of the trade is equally important to the first part of the process. Any macro manager who does not have a well thought out approach should be carefully reconsidered. The most important thing to look for on the risk side is consistency of approach and method. Without it, there can be no success.

Trading

One skill that is valuable in the risk management process is the ability to trade on a shorter time horizon, often a time horizon different from one's core view. It is also important to have the flexibility to trade against one's core view or position. Getting in the habit of seeing the other viewpoint will make it easier for a manager to exit a core position when the appropriate time comes. Having a predetermined exit point also helps one leave the party while the music is still playing.

The rarest combination of skills must exist within the macro manager you're considering. They must be able to look out over the medium term, but must also be sensi-

tive enough to nuances to manage that view daily. Many managers out there are big thinkers who cannot trade, while others are traders who can't really explain themselves. The rarity is the good macro manager who can see the medium-term picture before it happens, yet has the ability to trade that idea and convert it into performance.

Global Outlook

Another important attribute of a good macro manager is breadth and knowledge of many markets around the world. Some managers who are truly only fixed-income traders or relative-value players or emerging-market managers say they are global macro managers because they trade in some of the macro markets. As an investor, it is important that your manager has the ability to look across the globe to find the best bets and investments, that have the best risk/reward profiles, and that are the most obvious from a fundamental perspective. In this way, although it might appear that the macro manager is spread too thin or appears to be all over the place, they really are reducing risk by being involved in many different markets, some of which may be completely uncorrelated.

It is important to have the flexibility to trade against his core view or position. Getting in the habit of seeing the other viewpoint makes it easier for the manager to exit his core position when the appropriate time comes.

For instance, right now there is not a clear bet in G-10 bond markets, nor is there a clear bet in G-10 equity markets. Also, the dollar has dropped a long way, and there is not a good risk/reward profile to being short the dollar, especially against the euro as it approaches the European Central Bank's USD1.30/euro danger zone. Right now our portfolio is primarily long emerging market currencies: the Brazilian real, the Russian ruble, the Mexican peso, the Korean won. In each case, the fundamentals and technicals are very positive. Inflation has been overestimated for years in these countries and real yields are too high. Investors looking for yield pickup have been piling into the local equity and bond market, putting upward pressure on the currency as well. The cost of carry to be long these currencies against the dollar is also enormously positive right now.

Diversification

Diversification into many markets is a sign that global macro managers know what they're doing. Concentration on one or a handful of markets probably means they aren't really global macro managers, but rather market-specific managers. The current environment is so full of macro opportunities that as an investor you want your manager to be diversified.

Good Climate for Macro Now

The environment for global macro should be good over the next few years for several reasons. Since the global output gap is still wide, and measures of inflation are still declining, even as we experience high levels of GDP growth, policymakers will need to be activist. When policymakers are actively attempting to generate growth through fiscal, monetary, or currency policy, their actions can be knowable beforehand. I am not saying the inside word drives a macro trade, though it can, but rather if your

macro manager is doing his work, he should be able to make a fair guess at what policymakers should be doing. As each country around the world scrambles to generate growth, their policies are, in a sense, foreseeable. Norway and Switzerland, for instance, were very aggressive in using policy to stimulate growth in 2003 by actively seeking weaker currencies through low rates and Central Bank persuasion.

The macro environment should also be good because the large U.S. current account deficit (which really is a reflection of U.S. policymakers' desire to put off an economic slowdown) inevitably results in a weaker trade-weighted dollar. As U.S. rates are kept low to insure growth, the dollar depreciates against all other currencies, and depreciates most against high-yielding currencies. This fact also makes nondollar asset markets interesting, as one doesn't have to worry about local currency market depreciation. As capital flows into non-U.S. and emerging markets, local policymakers become active, attempting to control the effects of foreign capital inflow. Their attempts set off another set of events that are in a sense also foreseeable by a good macro manager.

Risks

Despite the opportunities that are now abundant in the macro world, there are risks when investing in a macro hedge fund. Aside from a manager being just plain wrong in his outlook, mistaking what is discounted by the market, or simply trading badly, there are some inherent structural risks. Investing in a fund that is too large reduces the manager's ability to diversify across the globe and limits his ability to trade around core positions. It is important that the investor sees that the manager has been successful in different types of environments and in different markets. Some of the large macro funds today are simply one-trade funds, funds that have been long fixed income, for instance, over the past few years.

Here are the risks of global macro strategy. The manager's ideas may be bad. The fund may be too large, limiting the manager's flexibility. The manager may not be competent in different markets or different cycles.

Success in one area over a certain period of time does not guarantee continued success. The way to minimize some of these risks is to find a manager who has the ability to gain and hold strong conviction in his position, but at the end of the day is flexible enough to change and perhaps even admit that the same position held with such conviction a day ago is now completely wrong.

Key Views of the Past and the Present

It has been said before that in the old days there was a perception that there were cowboys out there taking big bets on rates or currencies. I think the nature of the investor base of these funds has changed. In the early 1990s, a lot of the investors were wealthy individuals who basically just said, go out and make me as much money as possible.

I think today, fund of funds have become a much bigger component and their interest is really 15%-18% without very much volatility. The wealthy individuals could take the volatility because they wanted the return, but what the investors want today is dif-

ferent and that has affected the way money is made in macro markets. Some of the upside has been truncated, but there's much more control of the risk now than 10 years ago.

It used to be a much higher risk, higher return situation. I think it's now lower risk and lower return because the investor base has changed. But stylistically, each hedge fund, in my experience, is dominated by the character and personality of the person who runs it. So each hedge fund is completely different, but I think I've outlined some of the things you should look for.

The opportunity set in global macro strategies is certainly not predictable month to month, even though that's what most investors want. It's not realistic even in some cases year to year. There are years where there are a tremendous number of opportunities and there are years where there are not. Macro historically has had very bunchy returns, and for the most part that should continue because it's dependent upon how many opportunities there are.

Looking Toward the Future

On a five-year view, I don't think we're going to have any inflation. All the major ratings are still dropping, and that's after an 8% third quarter and what will be a 5% fourth quarter. Who knows what the first half will be. That isn't to say that there's a tight fit between growth and inflation — at some point, there should be, but what would have happened to those inflation ratings when we had only 2% or 3% growth?

All the supply is still out there. The move in commodities is more a reflection of the dollar drop. Copper and euro are not up as much. All of these commodities are dollar-based, so I don't think there's any sort of inflationary path yet, though we certainly haven't seen the data either.

Much of the activity we're seeing now also comes about from what I would call one-off stimulus from the second quarter after the Iraq War. We had very low rates and that sparked the refinance boom. We had the fiscal kick; we had the dollar dropping and we hit the meaty part of that decline.

I don't know necessarily that all those things may continue for three years. I think a lot of this activity was politically motivated for the election. I think it probably falls away at some point — and the impact of those stimuli fall away.

I think 2005 is going to be a very weak year. There's a chance 10-year U.S. Treasuries in the next five years could go the other way and get below 3%.

Such a very big picture view may not have any relevance to actually making money, but the other scenario is that these things are one-offs. Also, the stock market — in euro terms — hasn't done anything. So the stock market rally of 2004 really just reflected the

dollar drop. People here are not as wealthy; they just don't realize it. That's why the current administration is not caring about how much the dollar drops. ■

Dan Tapiero is the managing member of DTAP Capital Advisors, a global macro hedge fund, which opened January 2004 and currently runs $350 million in assets. Previously he managed a global macro portfolio for SAC Capital. From late 1996 to mid-1998 he also ran a macro portfolio for Sofaer Capital and had the added responsibility of overseeing the entire fund's macro exposure. From 1992 to 1996, he was a member of the global macro investment teams at Tiger, Argonaut, and Steinhardt Partners. He began his career in the fixed income department of Kidder, Peabody in 1991.

Mr. Tapiero graduated Phi Beta Kappa with Honors in History from Brown University in 1991. He graduated from the Lawrenceville School in 1986.

What's Up With the Stock Market?

David Einhorn, Greenlight Capital, Inc.

April 15, 2004

I don't have any top-down thoughts, but if I had one, it would probably be slightly bearish because I think inflation is going up and no one's had to deal with that since my bar mitzvah. The way I personally approach the examination of the market is to not think too much about it. I'm a bottom-up stock picker. My job is to find long and short opportunities based on whether I think they are good individual values. If I thought too much about the market, I probably wouldn't have achieved the results I have.

What I will address, which might be of broader interest, is what I perceive to be significant structural inefficiencies in the U.S. investment management profession and equity markets. These inefficiencies are so large that they create opportunities that I have been able to take advantage of — although it probably doesn't help me to spread this knowledge too widely.

The biggest inefficiency I see is that the big dollars in professional management are in relative value investing, which means the money is invested against the benchmark. The operative question for someone who's investing against a benchmark is, "Will this security outperform the benchmark?" The best way to go about investing money is to ask, "If I'm going to risk capital in this particular asset, does the reward outweigh the risk?" That is a fundamentally different question than, "Will it outperform the benchmark?" If you're only worrying about outperforming a benchmark, you're happy losing 20% of your money if your benchmark declines by 30%. In fact, you pat yourself on the back and you run an advertisement on television telling more people to give you money for this investment.

There are some large structural inefficiencies in U.S. capital markets. The largest one is that the big money in professional management is playing a relative value game against a benchmark. They ask, 'Will this security outperform this benchmark?' whereas I ask, 'Will the reward outweigh the risk?'

The exciting thing for me is that this is how most money is managed. So I don't have to do anything that smart. I just have to make sure that I ask what I think to be the better question, which is, "Does the reward on this particular investment outweigh the risk?"

The second big inefficiency is that professional investors — even if they're thinking about the right questions — are lazy in their analytical rigor. Or they're not capable. For example, I saw a survey from Merrill Lynch that asked a few hundred institutional investors, "What is the number one metric you use in evaluating whether an equity is attractive or unattractive?"

A recent study revealed that most professional investors use the PEG ratio to gauge a stock's attractiveness. The ratio of Price Earnings to Growth rates is the most widely used metric on Wall Street for its simplicity. But the proper relationship between the P/E and growth is not linear.

I was shocked and appalled when I read that the number one answer among institutional investors was the so-called "PEG" ratio. The PEG ratio, in case you don't know, is the price/earnings (P/E) multiple compared to growth rate expectation, presumably over five years. I first read about it in Peter Lynch's book, which I think was written so that my grandma could invest alongside Mr. Lynch without having to pay any fees. He didn't really go into a lot of technical valuation, but he basically said that if you discover the next Gap stores, you should make sure the P/E multiple doesn't exceed the growth rate because if it does, it's likely that somebody else has already figured out that this is going to be a good company.

The reason the PEG ratio is the most widely used metric on Wall Street is that it's very simple. Going back to my grandma — she could calculate it. How fast do I think it's going to grow? 15%. What's the P/E multiple? It's 25 times. So it's a 1.66 PEG and I can therefore benchmark it. That's the only reason to use PEG, because it's simple.

In reality, the proper relationship between a P/E multiple and a growth rate is non-linear, not linear as the PEG ratio assumes. This means you are fitting the flat line from the PEG ratio over a sharply accelerating curve. The lines intersect at two points, but there is a wide discrepancy at other points between the lines. This causes professionals who are using the most commonly used metric in investing to be using something that's completely nonsensical. Let me give a very simple example. A PEG ratio does not allow you to distinguish between the merits of an investment with a P/E multiple of one and an expected five-year growth rate of 1% versus a company with an expected growth rate of 100% for five years and a P/E ratio of 100.

Analysts don't correct for leverage when they evaluate P/E multiples. Levered earnings are more risky than unlevered earnings. They don't seem to recognize that it is less risky and cheaper to buy the unlevered company.

I assert that a P/E of one for a company that's not growing is an extraordinary opportunity. You're going to make around 100% annualized on your capital, and you don't have an enormous amount of forecast risk. Whereas a P/E ratio of 100 on something you think is going to grow at 100% will make a 1% return the first year, a 2% return the second year, and you'd better hope your forecast is right for years three, four, and five. So that's another major inefficiency — every time we see sell-side or buy-side analysts talk about PEG ratios, we think there's a reasonable possibility that the stock is misvalued by the market.

Another inefficiency is leverage. People evaluate P/E multiples, but they don't adjust for leverage. It's simple: leveraged earnings are more risky than unleveraged earnings. For example, the market may place a value of 15 times earnings on two companies, thinking that both earnings streams should be valued the same. However, the market doesn't recognize that one earnings stream is levered and one is not. It is much less risky, and in fact statistically cheaper to buy the unleveraged company.

The last major inefficiency that we see is investment horizon. By that I mean most investors — the ones who have a long-term view — are willing to buy something or hold something because they think the price will do well over the next six months. Never mind the people who think that they're going to make money on it the same day that they buy it.

Equities are long-duration assets. Their duration is much longer than six months, and it's very hard to predict what stocks might do in six months, individually or collectively. I suppose a lot of people find the career risk of owning "dead money" to be too high. I find it very exciting if I can own a portfolio of stocks where most of them aren't going to go up (or down if it is a short idea) for the next six months, but they will eventually perform because I think the risk/reward is attractive. Some of the stocks will surprise me and they'll go up sooner than I think. I won't necessarily know which ones will do so on day one. And if the biggest risk is dead money, that's not such a bad thing because what kills you in investing are the losers. If you lose money in something, then you have to do something else brilliant just to get yourself back to square one.

Equities are long duration assets. Predicting their outcome over six months is difficult. The career risk of owning dead money beyond six months is high. That's exciting.

Investors who avoid stocks because they don't perceive them likely to appreciate in the near-to-intermediate term create a lot of opportunity for folks who are willing to look at the longer term and hold a portfolio.

I buy a whole bunch of individual situations where I think there are inefficiencies, but I don't know how long it will take for those situations to pay off. As patient a guy as I am, it's always longer than I wish, but occasionally it surprises me. The good news is, because I have a basket of these situations, and they're very idiosyncratic, I don't need to know which one is going to hit hardest. They're going to hit at different times, mostly. As a result, if I don't make any big mistakes and lose, it doesn't really matter to me when an individual idea hits, because I have enough of them that if any of them hit, I'm going to do just fine.

In the long term, absolute-return investing eventually has to be offered to more people. The very large profesional money management companies should abandon their relative value investing, their benchmark investing, and should offer instead absolute-return, mutual-fund products. But they'll need to educate clients properly that in a rising market the fund will underperform.

Once that happens, big dollars can go into these kinds of strategies. The world can converge. The markets can become more efficient, and frankly, the fees for the few who are doing the absolute return investing — who are a small percentage in the scheme of things — will converge and come down and we'll wind up with a much more sensible investing climate. Then I'll be left with trying to outperform those who are still using the PEG ratio. ■

In the long run, absolute return investing should be offered to more people. Big money investors should abandon their benchmarks.

David Einhorn founded Greenlight Capital, Inc., a long/short value investment firm, in January 1996 and has acted as president and portfolio manager. He began his career at Donaldson, Lufkin & Jenrette (DLJ) as a generalist in the Investment Banking Group. At DLJ, he was involved in merchant banking, merger and acquisition, and capital raising activities. Mr. Einhorn was a member of investment banking teams that provided advice to a number of corporate clients. After DLJ, he joined Siegler, Collery & Co., a buyout and investment management firm, as an investment

associate. He performed fundamental research for the purpose of recommending new investments for the firm's capital, monitored existing investments, and worked on projects to actively maximize the value of the firm's investments.

Mr. Einhorn graduated summa cum laude with distinction in all subjects from Cornell University in 1991. He earned a BA from the College of Arts and Sciences. He won the Clyde A. Duniway Award given annually to the top graduate majoring in government and was elected to the Phi Beta Kappa society.

What's Up With the Stock Market?

Jeremy Grantham, Grantham, Mayo, Van Otterloo

April 15, 2004

The stock market can be condensed to four things. First, mean reversion. Everything goes back to trend. Second, uncertain timing. We don't really know when it goes back to trend. Third, career risk. Nothing is arbitrage-able if you have uncertain timing. Fourth, size matters. Do well with $500 million and they'll give you $5 billion. Do well with $5 billion and they'll give you enough money to make sure that whatever value you could add is gone.

The 100-year P/E trend on the stock market is 16. The normalized return on sales is 6%. Multiply 16 by 6, giving you a trend line of 720 on the S&P 500. The stock market will go back to 720. If it does not it will be the first time in history.

I think a world record could be set in how briefly one could describe how the market works. A group of us got it down to eight words: *mean reversion* — that's the only really important thing I know about the market — everything goes back to the established trend. *Uncertain timing* — unfortunately we just don't know when it's going to go back to trend. *Career risk* — and if you have uncertain timing, it can't be arbitraged. There can be wonderful opportunities, but if the timing is uncertain, your job or your business is on the line.

Finally, *size matters*. It's a secret outside our industry, yet every practitioner knows that size is a killer. The investment management business is the best example of the Peter Principle[1] ever designed: Do well with $500 million and they'll give you $5 billion. Do well with $5 billion and they'll give you enough to make sure that whatever value you could add is gone!

Those eight words cover just about everything concerning the market. What is the trend on the market? The trend is easy. Trend line P/E is 16; that's hardly debatable. It's the 100-year trend that started in the last century at 12 and ended at 16. P/E trended slightly higher because the world became a safer place. Manufacturing dropped, services rose, GNP became more stable, and the stock market became more stable. Therefore you should need a lower return to be bribed into buying risky stocks and that is the way it worked out, which seems pretty plausible. Note, though, that when doing P/Es, a normalized earning space is necessary. Recessions can't be compared with booms. So that's pretty easy, too.

The normal return on sales is about 6%, to be generous. So take 6% on sales as a normal earnings base and multiply it by 16 and that results in a trend line market of about 720 on the S&P500. That's that. The market will go back to 720, step one. If it doesn't, it will be for the first time in history.

Our group has been through every asset class for which data exists in machine-readable form. One of our team members cheered that he'd found Prussian rye from 1685. We have no trouble, unlike Federal Reserve Chairman Alan Greenspan, defining what a bubble is. A bubble is a two standard deviation event — the kind that would occur randomly every 40 years. That sounds reasonable. We went through commodities, currencies, stock markets, all over the world — all the way down to

1. The Peter Principle is the theory that employers within an organization will advance to their highest level of competence and then be promoted to and remain at a level at which they are incompetent.

The ugly thing about reverting trends is that they over correct.

Kuwait — and we found 27 bubbles. The most important include oil, gold, 1929, 1965, and Japan in 1989 — all the obvious candidates.

Of these 27, we asked a very simple question since we were betting the firm at the time. On mean reversion, how many of the 27 bubbles in the last 100 years went back to trend? The answer's easy, too: 27. It was mean reversion: 27; new paradigm: nil.

Intellectually we all know there can be a new paradigm, so any bull who thinks it's going to be permanently above a 16 P/E can entertain a justifiable hope that this time it's different. It never has been different yet, but hey, there's always a first time.

So we're going to go back to 720. Every great bubble that's broken — and I don't mean *most*, I mean *every* — has overcorrected its trend line. The ugly thing about trend lines we all forget is that, by definition, half your time is spent below the trend line. And most of the time spent below the U.S. trend line has been precisely following the breaking of the great bubbles. The great bubble of 1929 broke by 1932. That was one of the quicker ones. All of the 1930s, all of the 1940s, and right through to 1958 was below trend — that's not bad. The 1965 peak broke by 1974. All of the 1970s and all the way up to early 1988, or for a minute or two in 1987, were below trend.

Politics have an important role. The presidential election and the Federal Reserve cycle are better than value on a one-year horizon in predicting the economy. In the last two years of a cycle, the president engineers a stimulus, strong economy, and rising employment to get votes. In the first two years, they tighten the controls to create elbowroom in order to expand in years 3 and 4. In years 3 and 4, speculate; buy growth stocks. In years 1 and 2, duck! Buy value stocks. Since 1932, the politicians have engineered this to work like clockwork.

Japan's was probably the greatest bubble in the world — bigger than the recent U.S. bubble. It has been below its trend for the last seven years and counting. That is absolutely typical, so we are likely to go below 720, spend several years below the trend line, which grows at about a 1.8% real rate — enough to bore you to death. You have to be prepared for a correction below 720 for a period of several years. Any expectation to the contrary is in complete defiance of a huge breadth of historical data over a vast variety of different economies and different asset classes.

Recently we've spent a lot of time trying to get the trend line fixed on closer timing. We found that the politics of the economy, specifically the presidential cycle and Federal Reserve cycles, tell you a lot more on a one-year horizon than value. Value is brilliant over seven years; very good over three or four; and fairly weak over one, and that is its great problem. But the presidential or Federal Reserve cycle is pretty good over one year — about three or four times better than value or mean reversion.

The presidential cycle is the most easily understood concept of anything I know about the market. In the last two years of the cycle you engineer stimulus, a strong economy, and a decline in unemployment — which is the thing that most drives the vote. The first two years you tighten the ship in order to create elbowroom for years three and four. The numbers are amazing since 1932 when John Maynard Keynes explained to President Franklin D. Roosevelt all about stimulus. Since then the system has worked like clockwork. The average third year, which is when the heroics go on, is nine points a year ahead of average. Years one and two average almost minus five. The consequences for the year-by-year are immense. Over half of all years one and two are down in real terms, 19 out of 37. No year three has ever been down materially. There

was one year, 1947, when everything was going wrong — the popularity of the president was off the bottom of the totem pole, North Koreans were massing on the border, the Berlin airlift occurred, etc. — and it went down 2%. That was the worst year three that has ever happened. The value of the market does not matter at all in year three. You can go in with the most overpriced market in history like 1999 and it doesn't even pause for reflection — it goes straight up.

The return to risk is also exactly what you'd expect. In years three and four, the driver is moral hazard. Basically, throwing money at the battleship GNP is only modestly effective. But when you do that, you create overflow into the financial system, which is hugely effective. The unintended consequence of trying to drive election numbers is a huge move in the stock market. That's all pretty straightforward.

If you look at the statistics — GNP, productivity and so on, it's not enough to explain the market. The bedrock is moral hazard. Statistics show in years three and four that not only will they try and keep rates low and money available, but trust me, if anything unexpected goes wrong, they will try and bail themselves out to get reelected and, inadvertently of course, bail you out. If you hear what they are saying in year three you speculate.

In years one and two, suckers, you're on your own. In fact, it's worse than being on your own — they're going to come and tighten the screws. You see this in the data internal to the market: growth stocks win big in year three. Even though they lose overall, they win by five points in year three. Volatility, however, is the biggest. Volatility is about 17 points ahead of the market in year three, and about 11 points behind the market in year one. So by year one, you want to duck.

Year four is an interesting year. It's the only normal year. It's normal in every way except volatility. Since 1932 the volatility of year four has been half of the other three. Not 83%, half. Instead of plus or minus 22%, it's plus or minus 11%. This world is not efficient. This is an amazing disparity. Year four is very stable; you coast up to the election; no heroics. Unemployment rises in years one and two, falls in year three, and drifts to a new cycle low in year four. Everything is working well. It is amazing and impressive that the politicians have worked out what moves the vote and have engineered some moderate and important success in getting the numbers they need.

On the short-term horizon, this current year four represents a big hangover from the stimulus of last year, which was the biggest stimulus in American history. My bet is that this is skating on thin ice, but the ice will hold for the first few months of this year. Our firm took more risk than normal last year in the first quarter. I think it should be good for another quarter or two or even three, which would be delicious. We are slicing out month-by-month, which is what I recommend. We've gone for more risk than normal — big positions in emerging equity and emerging debt; big positions in small cap international. Even in the individual funds, we have a higher risk profile than the market on January 1.

By the end of May 2004 we should have a normal risk profile in the funds. We're beginning to slice out of the high-risk asset classes. By the end of June we will be almost where we are normally as a firm, which is moderately more conservative in every fund than the market. By December, we intend to batten down the hatches completely — to have as little risk as we can possibly take.

The interesting things in the market are quality and junk — last year was perhaps the best return to junk ever recorded. There is no category of junk that did not do well — quite unlike 1999, for example, where small capitalization stocks were trashed. The consequence is that high quality stocks are, relative to the market, interestingly cheap. Small cap is even better, albeit expensive. I have a long history of loving small cap, but everything has a price and it's expensive.

Volatility is expensive, so the numbers are in agreement with the presidential cycle. Value matters reasonably this year, unlike year three, and value matters enormously in year one. We go into year one with a horribly overpriced market with debt coming out of our ears, however you measure it, and an enormous need to tighten the screws. There's a great amount of moral hazard — probably a world record — when interest rates start to rise and when we hit next year. It's what I call a black hole.

I think it's the best bet in my career that 2005 and 2006 will be bad. In the meantime, broadly based assets are as overpriced as they have ever been in my experience — 1999 and 2000 are no comparison at all. In March of 2000, making money for a client who was reasonably flexible was a piece of cake. Bonds were cheap; TIPS yielded 4.2%; real estate was cheap; REITs peaked at 9.2% yield; small was almost as cheap as the nifty-50 era (a trend in the 1960s-1970s of buying 50 large, well-known stocks with high P/Es); value was the cheapest relative to growth that it's ever been in history. What was the result? Small cap value rose through the decline; REITs went up 35%. Bonds went through the roof — double digit. TIPS were spectacular. It wasn't difficult at all to actually make real money every year of the decline, which I'm happy to say, we did. This time it will not be easy, and in fact I expect that in accounts that do not allow short positions, we will lose money however hard we try.

We've looked at four typical parameters of the S&P 500 since 1926. The important ones are a measure of replacement cost called Tobin's Q ratio and a rolling average of 10-year P/Es to normalize the earnings. The two standard deviation events show how stunningly similar the shape is around the trend line. The top spike is dramatic with all four parameters. If you could not see that spike, you were not looking at the data. And if you saw it and did nothing, you're chicken.

Based on mean reversion and normal profits, we work it through and amortize the pain and pleasure over seven years. Instead of taking it down tomorrow, we take the P/Es down from currently 24 times trailing to 16; we take the profit margins down a little bit to normal, and so on. And these are the numbers we get: U.S. large cap minus

2% a year for seven years, after which you get the normal return of 5.7% real return. If you get the pain over quicker, you get to 5.7% quicker. If it overcorrects, which it probably will, you'll get to 7% real, which will be wonderful. International is not bad in comparison, but not good absolutely. Emerging markets, overpriced finally after fabulous performance, are up another 10%-12% this year. Our emerging markets product was up 70% last year.

Poor old REITs — in March of 2000 our estimate for REITs was 10.5% real — right at the top of the market, 10.5%, and now 2.4%, although recent days have taken it all the way back to 3.4% or 3.5%. It's getting to be interesting — it might even be 4% since it's been seriously declining.

Let's consider something different. Managed timber — my favorite asset class — is simply a mispriced asset. If you're not buying timber it's because it's unfamiliar. There are two reasons timber has a high return. First, it's illiquid. For any illiquid asset class, you should get paid 1% or 2% extra a year. Second, it's unfamiliar and therefore carries career risk. With any unfamiliar asset class, you should get at least 1% or 2% a year, because your career matters. So there are two perfectly plausible reasons why you get 3% or 4% more than is justifiable by the risk and return of the asset class. Timber has beaten the S&P market indices for the last 80 years, yielding 5% versus the S&P500's 1.5%. The price series alone has won without yield and it's negatively correlated with some of the biggest breaks of the U.S. equity market including 1929 and the inflationary one of the 1970s. The price of timber has held and the yield has given a positive real return when it was really, really needed.

Timber has higher returns than stock because it is illiquid and misunderstood. It has beaten the S&P for the last 100 years and has been uncorrelated.

A "bubbles break" exhibit would show the recent S&P 500 bubble which ends at the bottom of the market in September 2002 as one of the most beautiful, round, perfect bubbles ever recorded by mortal man. Imagine the excitement to see people wondering what's going on month by month, rising, rising, rising over the top and down the other side.

Since then they turned around and spiked back to one-and-a-half standard deviation overpriced. This is not how bear markets end. Bear markets do not end with a complete and easy return of speculation with a huge recovery in the Internet survivors led by tech stocks and led by growth stocks. A great bubble ends with nothing but talk about fiduciary responsibility and protection of assets and a move to bonds and a fear of risk, risk, risk on every side. This is not the environment associated with this particular bubble yet.

Japan, on the other hand, was death and destruction, gloom and doom. So were the 1930s and the 1970s. And this cycle will be so one day.

The point is you can know all this about trends and bubbles and you can do nothing about it because it's so profoundly dangerous to your personal career or your company that you cannot get up and say, typically, "This is a terrible bubble about

to break — duck." Clients don't want to hear it. I was barred from a large New York-based institution because they said I was plausible and therefore dangerous to their large growth stock positions.

We went from $30 billion to $20 billion in the greatest bull market in American history. That actually is difficult to do. The market was trying to take our asset base up all the time and we were falling. We had 45% of our assets withdrawn for making the right bets for the right reason and winning them. We lowered the risk and increased the return and lost more business than our competitors. It is a dangerous thing to do. If you're a public company, you simply cannot do it. If you're jumpy, you can't do it. And it will be this way forever. Career risk will never go away. Benchmark specialization, market niches, measurement, style drift will never go away. Career risk is rising, not falling. It becomes more dangerous to make these bets as time goes on.

Bear markets don't end with growth stock and technology stock rallies. They end with talk of fiduciary responsibility, protection of assets, a move to bonds, and an obsession with risk. Too much optimism still exists. Career risk is rising.

In the old days you went to the gentlemen at Morgan Guaranty and said, "Here's our money, manage it." If he wanted to buy a few more bonds or a couple of international stocks, he did. And then it split into more and more subdivisions, increasing the risk, lowering the arbitrage mechanism, until the opportunities become bigger and bigger, until you ended up with colossal opportunities that no one dared take advantage of.

It is possible to recognize the existence of an arbitrage opportunity, as reflected in either risk/reward for investing or in mean reversion, without having a clue as to when it will come true. In effect you have to invest for a longer term than would be comfortable and simply stay with the uncertainty of how quickly the reality you perceive will percolate into the market and actually reward the portfolio. But you can't get blood out of a stone. One of the central issues in our business is real risk versus benchmark risk.

Portfolio Management 101 says all you need to know are the real estimates, the real return, the real risk – and the difference between the asset classes. That's how you build a portfolio. You look for the highest risk/return ratio, the Sharpe ratio, and you build the most efficient portfolio that the client's risk tolerance will take. It's absolutely basic and nobody in round numbers does it.

When we started to offer it as portfolios, the portfolio didn't look like anything anyone was used to. We did it two years before the market peaked. We offered real, absolute return portfolios. We screamed about it at client conferences wherever we went, and we had zero takers. Finally, a wealthy individual was teased into doing it, because I said no one had enough hair on their chest, and he said he did. He had $50 million, he said, chomping on a cigar. Later, as the market broke, it became easy to sell and we filled up and closed down to new clients. Why did we have to close them down? Because they used huge pieces of emerging equity and internationall small cap. We didn't have any U.S. equities in that portfolio — it simply didn't have enough return. So there was this very strange-looking portfolio with some fixed income and lots of emerging

equity and so on, and a few REITs. The truth is, few investors can live with a portfolio that comes out of a realistic optimizer.

You could offer it as much as you like, but you basically get no takers except in a market decline. Then in the next bull market they all leave again. It's a hopelessly noncommercial strategy, even though it's exactly the right thing to do, because it's impossible to educate the clients. One of the reasons is because the clients keep changing. You spend years brainwashing some of the hired guns on a committee of some college, and then you show up and they're all gone and there's a bunch of gunslingers from hedge funds! And you have to start all over again.

As quants, we tie macro effects on the economy into our portfolio considerations by programming regression at the asset class level, at the sector level, with regard to growth versus value, and large versus small, which are really important. And then at the country level — Germany versus England, for example — and even at the currency level. Then in industries and individual stocks. Because there's a lot of specific noise at the stock level, it only works if you have 200 of these stocks with one characteristic versus 200 of those with an opposite characteristic. You know that in the long run you'll win, but you don't know which companies will do it — there will be exceptions, of course, at the company level. If you have a large portfolio, it will come through dependably, as it always has done.

We have regression programmed from top to bottom and it's probably at least as important at the stock level, having profit margins regress at the right rate in your model, as it is at any other level. Our hit rate at the stock level is about the same as it is at the sector level — a little bit lower, and that's almost as good as it is at the asset class level — a little bit lower again. The highest probability is at the asset class level — they always win. There aren't exceptions. An individual company can cease to exist or can spiral up and become a Microsoft, but an asset class can't do that. The trouble is, even though the hit rate is higher, because there are so few bets, the risk level with clients is much greater. You have to be much more careful handling that risk than you do for a single stock.

I think the amount of shorting will increase enormously and the hedge fund business will grow enormously in the next 10 years, assuming that of the world's $50 trillion pool of savings, $15 to $20 trillion of that is equity. It shows every sign of a bubble superficially, but when the market comes down, practically every hedge fund is going to look like a hero. If the market hits 580 in three and a half or four and a half years, everyone who owns hedge funds will feel enormously reinforced and the hedge fund industry will continue to grow on the market's way down and on the early years of recovery. It already affects the market. Things trade differently in emerging debt and that's been a cutting edge of the hedge fund business. But the response to interest rates is accelerating and so on.

It is still a zero-sum game. Investment management does not create a single unit of value; we shuffle the chips in the cosmic poker game from the bad players to

the good players, but we don't create any value. Hedge funds don't change that; they just take more off the table in fees. So the end part decreases the more hedge funds show up and start making money. Someone else is losing an equal and offsetting amount of dough while transaction friction and commissions rise. And the clients are paying for all of it.

What's more, there's a liquidity crisis. We're really setting ourselves up for the next great liquidity crisis with the great growth of hedge funds — the next great Long Term Capital. One thing almost every hedge fund has in common is their short liquidity. They own less liquid issues than they're short. One day there will be a terrible rush for the door, together, to cover. Perhaps the next one will be a fixed-income rush with everyone doing the carry trade. These, I think, will beat new world records, and we'll see that already the hedge fund business has dramatically changed the game.

I can tell you what my portfolio would look like on January 1, 2005, because I don't have any constraints. Short the S&P 500, long emerging equity, international blue chips, and small cap international where I'm interested in the spread of value, which is about as big as it's ever been. Short junk stocks, long blue chips where I'm interested in the spread rather than the actual moves that either will make. Some short-term cashy-looking things, but almost all of it in hedge fund form. Conservative market-neutral hedge funds, cash plus, and 10% or 15% in timber, and perhaps 2%, 3%, or 4% in REITs if they yield a little bit higher than they do today.

For an institutional-sized portfolio I would recommend clients get as close as they dare to what I've described: pick fixed income — the Warren Buffet approach. I was thrilled when he said not only had he built up vast cash, but he also admitted that he'd been very underpessimistic in March of 2000. He had hurt us a lot saying, "Yeah, it's a little overpriced; big deal." That really cut into our credibility. I was elated when he threw in the towel and said he'd made a bitter error. Now he just can't find opportunities so he just builds cash. That's what ordinary people who have billions have to do. Ugly cash. Minus 1%. But it's better than — as he said — the alternatives.

I don't think it's much better today. I'm with the other cynical investors skating on thin ice. I think we can squeeze out a little more from emerging and small cap international and maybe even in the U.S. for a few more months, but that's just cynical gamesmanship, or if you prefer — the best offense is the best defense. We want to have some money in the war chest so that when we batten down the hatches in December, we can stand the market going up for a while — mocking us — which no doubt it will do. ■

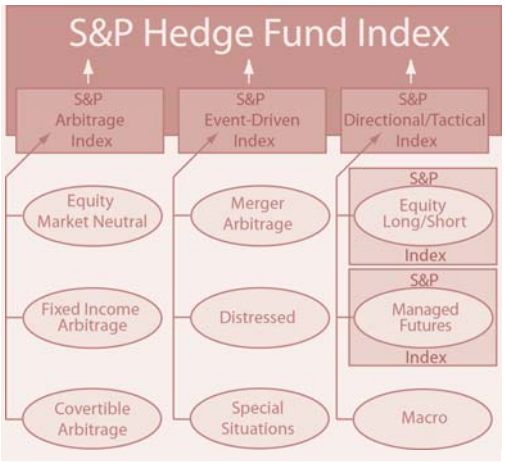
Jeremy Grantham co-founded Grantham, Mayo, Van Otterloo (GMO) in 1977. He serves as Chairman and oversees its quantitative products and investment strategies. GMO is a privately held global investment management firm primarily for institutions. The firm was founded on the philosophy of value-oriented investing and constant innovation. GMO offers fundamental and quantitative investment products

including domestic and international (developed and emerging) equities and global fixed income products. GMO also manages absolute return hedge funds and other alternative investment products. Prior to GMO, Mr. Grantham was co-founder of Batterymarch Financial Management in 1969 where he was one of the first to recommend commercial indexing in 1971. He began his investment career as an economist with Royal Dutch Shell.

Mr. Grantham also serves on the investment boards of several Boston-based, non-profit organizations. He has been featured in Forbes *and* Barron's *and is routinely quoted by the financial press.*

Mr. Grantham earned his undergraduate degree from the University of Sheffield, U.K., and an MBA from Harvard Business School.

S&P Hedge Fund Index Data and Analysis



Standard & Poor's offers a growing family of hedge fund indices. The main S&P Hedge Fund Index offers investors an investable benchmark that is representative of the broad range of major strategies that hedge funds employ. The index currently has 40 constituents grouped into three sub-indices. The nine strategies are equally weighted to ensure well-rounded representation of hedge fund investment approaches and to avoid over-representation of currently popular strategies. The S&P Managed Futures Index and the S&P Equity Long/Short Index are expanded versions of their respective strategies in the main index with constituents added to ensure broader representativeness.

Standard & Poor's commenced calculation of S&P HFI values in October 2002, of the S&P MFI in January 2003, and the S&P ELSI in April 2004. The S&P Hedge Fund Pro Forma Indices returns are derived by Standard & Poor's from data received from the fund companies themselves to the extent available back to January 1998 for S&P HFI and S&P MFI and April 1999 for S&P ELSI. Standard & Poor's has not verified the validity or accuracy of this data and does not recommend any investment or other decision based on their results or on any other index calculation. The funds included were constituents of the S&P HFI as of September 2002, of the S&P MFI as of December 2002, or of the S&P ELSI as of March 2004. Past performance is not necessarily indicative of future results.

Daily Indicative Index Series Return Summary (as of December, 2004)

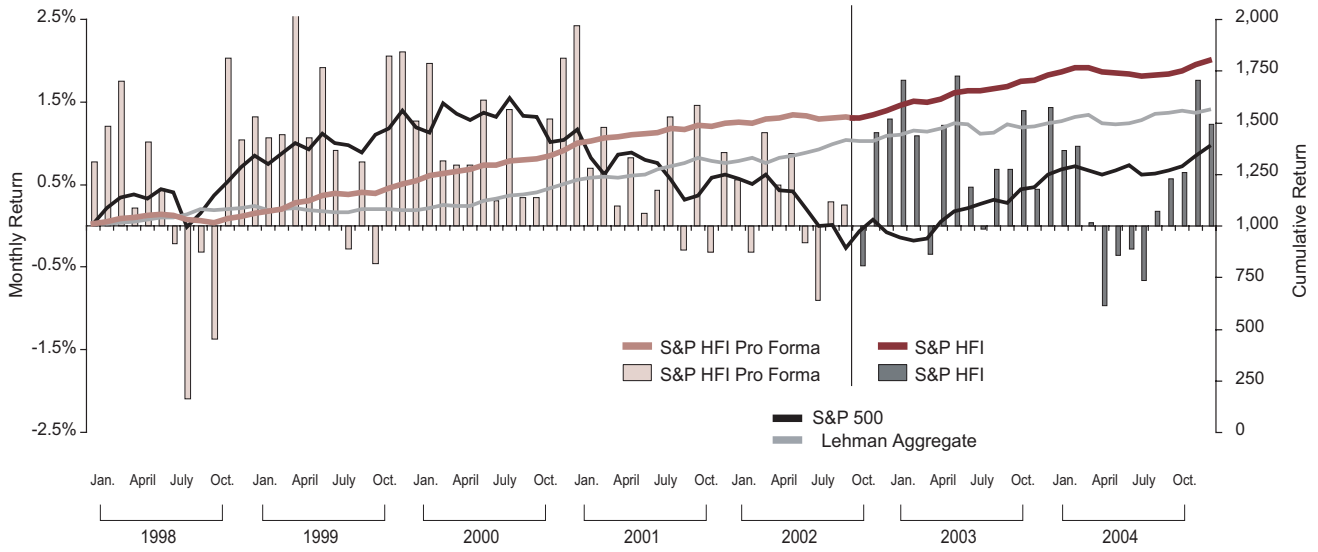
Index	MTD	QTD	YTD	ITD[1,2,3]
S&P Hedge Fund Index	1.23%	3.43%	3.88%	17.26%
S&P Arbitrage Index	0.91%	0.45%	2.36%	5.51%
S&P Directional/Tactical Index	1.45%	6.30%	3.62%	20.11%
S&P Event-Driven Index	1.33%	3.66%	5.66%	26.49%
S&P Managed Futures Index	-1.03%	10.10%	4.59%	13.85%
S&P Equity Long/Short Index	1.33%	4.34%	-----	1.73%

1. Inception (9/30/2002) to Date for S&P HFI and three sub-indices.
2. Inception (12/31/2002) to Date for S&P MFI. 3. Inception (3/30/2004) to Date for S&P ELSI.

www.sp-hedgefundindex.com

See the above Web site for a daily, dynamic update of this Index Return Summary, as well as historical returns, pro forma returns, methodology, announcements, and constituents.

Monthly and Cumulative Returns of S&P HFI and Pro Forma Index with S&P 500 and Lehman Aggregate Bond Index



Correlation to Other Asset Classes and Similar Indices (January 1998 - December 2004)

	S&P Hedge Fund Index	S&P Arbitrage Index	S&P Directional /Tactical Index	S&P Event-Driven Index	S&P Managed Futures Index	S&P Equity Long/Short Index	S&P 500	S&P Small-Cap 600	Lehman Agg. Bond Index	Merrill High Yield Master II	CSFB Tremont HF Index	HFR Fund Wgt. Comp.
S&P Hedge Fund Index	1.00											
S&P Arbitrage Index	0.50	1.00										
S&P Directional/Tactical Index	0.66	-0.11	1.00									
S&P Event-Driven Index	0.72	0.28	0.15	1.00								
S&P Managed Futures Index	0.28	-0.09	0.76	-0.31	1.00							
S&P Equity Long/Short Index	0.66	0.04	0.49	0.65	0.03	1.00						
S&P 500	0.27	-0.09	0.04	0.55	-0.34	0.55	1.00					
S&P SmallCap 600	0.47	-0.01	0.23	0.65	-0.21	0.71	0.73	1.00				
Lehman Aggregate Bond Index	0.10	0.01	0.28	-0.16	0.38	-0.15	-0.23	-0.18	1.00			
Merrill High Yield Master II	0.48	0.23	0.05	0.69	-0.26	0.35	0.47	0.52	0.08	1.00		
CSFB/ Tremont HF Index	0.66	0.26	0.39	0.59	-0.02	0.84	0.41	0.61	-0.01	0.40	1.00	
HFRI Fund Wgt. Comp.	0.64	0.09	0.36	0.74	-0.16	0.91	0.72	0.84	-0.12	0.54	0.83	1.00

Performance of Various S&P Indices and Other Asset Classes*

	1998 (%)	1999 (%)	2000 (%)	2001 (%)	2002 (%)	2003 (%)	2004 YTD (%)	Last 12-Month Return (%)	3-Year Annual Return (%)	5-Year Annual Return (%)	3-Year Ann. Std. Dev. (%)	5-Year Ann. Std. Dev. (%)	5-Year Sharpe Ratio
S&P Hedge Fund Index	4.49	15.35	13.48	9.36	4.15	11.12	4.11	4.11	6.41	8.38	2.64	2.63	2.18
S&P Arbitrage Index	-0.22	13.20	14.52	13.01	6.96	2.08	2.79	2.79	3.92	7.75	1.74	2.67	1.91
S&P Directional/Tactical Index	13.51	17.30	12.32	6.74	4.76	15.28	3.53	3.53	7.73	8.43	5.14	5.81	1.00
S&P Event-Driven Index	0.29	15.52	13.40	8.47	0.69	15.97	5.97	5.97	7.36	8.77	4.01	3.89	1.57
S&P Managed Futures Index	21.58	6.29	15.92	5.70	20.03	8.89	4.56	4.56	10.97	10.86	16.78	17.26	0.48
S&P Equity Long/Short Index	---	37.84	12.29	6.71	-5.15	17.41	4.18	4.18	5.08	6.81	5.38	6.15	0.68
S&P 500	28.58	21.04	-9.10	-11.89	-22.10	28.68	10.87	10.87	3.58	-2.30	15.07	16.35	-0.30
S&P 500/Barra Value	14.67	12.72	6.08	-11.71	-20.85	31.79	15.71	15.71	6.47	2.48	16.67	16.89	-0.01
S&P 500/Barra Growth	42.16	28.25	-22.08	-12.73	-23.59	25.66	6.13	6.13	0.63	-7.07	14.24	18.03	-0.54
S&P 500 - Cons Disc	41.14	25.18	-20.00	2.79	-23.82	37.41	13.24	13.24	5.83	-0.51	17.12	20.19	-0.16
S&P 500 - Cons Staple	15.76	-15.09	16.78	-6.40	-4.26	11.57	8.15	8.15	4.93	4.78	10.82	13.43	0.16
S&P 500 - Energy	0.63	18.73	15.68	-10.40	-11.13	25.63	31.53	31.53	13.66	8.76	16.69	17.37	0.35
S&P 500 - Financials	11.42	4.12	25.70	-8.95	-14.64	31.03	10.89	10.89	7.44	7.26	16.18	19.39	0.24
S&P 500 - Health Care	43.88	-10.66	37.05	-11.95	-18.82	15.06	1.68	1.68	-1.71	2.77	12.33	14.95	0.01
S&P 500 - Industrials	10.87	21.50	5.88	-5.74	-26.34	32.20	18.03	18.03	4.75	2.78	16.12	18.61	0.01
S&P 500 - Info Tech	78.14	78.74	-40.90	-25.87	-37.41	47.23	2.57	2.57	-1.87	-16.17	29.04	37.42	-0.50
S&P 500 - Materials	-6.18	25.26	-15.72	3.48	-5.46	38.19	13.20	13.20	13.94	5.22	19.70	22.44	0.11
S&P 500 - Telecom Svc	52.37	19.14	-38.81	-12.25	-34.11	7.08	19.86	19.86	-5.43	-14.60	30.29	28.45	-0.61
S&P 500 - Utilities	14.84	-9.18	57.19	-30.44	-29.99	26.26	24.29	24.29	3.18	3.73	19.97	21.53	0.05
S&P MidCap 400	19.11	14.72	17.51	-0.60	-14.51	35.62	16.49	16.49	10.54	9.54	15.13	17.69	0.39
S&P SmallCap 600	-1.31	12.40	11.80	6.54	-14.63	38.79	22.66	22.66	13.27	11.60	17.23	19.74	0.45
CBOE Volatility Index (VIX)	1.71	-4.18	14.74	-11.36	20.25	-36.02	-27.42	-27.42	-17.65	-10.70	51.84	53.06	-0.25
S&P REIT Composite	-19.68	-5.53	28.86	14.15	4.19	36.11	31.77	31.77	23.17	22.41	14.78	13.99	1.41
S&P Commodity Index	-27.63	7.23	42.43	-31.68	27.19	21.74	8.22	8.22	18.78	10.27	15.59	16.62	0.46
S&P Global 1200	24.64	25.13	-10.79	-15.01	-19.55	32.94	14.91	14.91	7.11	-1.40	14.99	15.82	-0.26
S&P 700	18.08	32.60	-13.28	-20.26	-15.55	40.87	20.22	20.22	12.67	-0.22	16.30	16.71	-0.17
S&P/IFCI (Investable Emr Mkt)	-22.01	67.11	-31.76	1.77	-3.94	57.17	28.15	28.15	24.61	6.09	17.85	21.64	0.16
S&P/IFCG (Global Emr Mkt)	-21.07	62.70	-28.77	-0.28	-5.65	54.44	27.64	27.64	22.98	5.73	15.97	19.45	0.16
U.S. T-Bills	4.82	4.66	5.85	3.45	1.60	1.02	1.40	1.40	1.34	2.65	0.11	0.53	---
Lehman Aggregate Bond Index	8.67	-0.83	11.63	8.42	10.27	4.11	4.34	4.34	6.20	7.71	4.34	3.96	1.28
Merrill High Yield Master II	2.95	2.49	-5.14	4.49	-1.84	28.14	10.88	10.88	11.73	6.69	8.47	8.96	0.45

*As of December 31, 2004

The Greenwich Roundtable

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