COMMENTARY

A Report of TIFF EDUCATION FOUNDATION

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a mutual fund family
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Highlights

On July 26, 2006, the TIFF Education Foundation (TEF) hosted an endowment management seminar in Cambridge, Massachusetts. Modeled loosely after the highly praised cable TV show *Inside the Actor's Studio*, the seminar comprised interviews by TEF president David Salem – a suspect substitute indeed for James Lipton of *ITAS* fame – of five leading lights in endowment management broadly defined. This *Commentary* comprises excerpted transcripts of the two final interviews:

Bill Helman, a general partner at the Boston-based firm Greylock, discusses the evolving environment for the venture capital industry; and

Jeremy Grantham, co-founder of the global investment management firm GMO, outlines his strongly held views on investment policy formulation, beta, career risk, energy prices and many other issues germane to endowment management.

Unabridged recordings of all five interviews are available for free at www.tiff.org/TEF.

About TIFF

Origins. In 1991, a network of foundations founded a cooperative-style investment organization whose structure and eligibility criteria have evolved over time but whose core mission has not. Known colloquially as TIFF, this organization seeks to improve the investment returns of endowed charities by making available to them a series of multi-manager investment vehicles plus resources aimed at enhancing fiduciaries' knowledge of investing.

The organization comprises three regulated entities at present: a tax-exempt private operating foundation whose d/b/a (TIFF Education Foundation) is more descriptive of its focus on education than its formal legal name (The Investment Fund for Foundations); TIFF Investment Program (TIP), an SEC-regulated mutual fund family; and TIFF Advisory Services (TAS), a taxable non-stock corporation and SEC-registered investment advisor that administers all investment vehicles bearing the TIFF name. As noted at left, there is substantial but not complete overlap among these three entities' boards. The members of these three entities' boards (except Richard Flannery and David Salem) serve as volunteers who receive no salary for their service to such boards.

Inquiries. For more information, please call TIFF at 434-817-8200 or visit www.tiff.org.

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BILL HELMAN

Bill Helman joined the Boston-based venture capital firm Greylock Partners in 1984. As a general partner at Greylock, he focuses on information technology and biomedical ventures. Excerpted below is an interview of Mr. Helman by TEF president David Salem focusing, among other topics, upon the evolving environment for private equity investing, China, India, and diversity in the venture capital industry. Mr. Helman's bio appears at www.tiff.org/TEF.

Structural Sustainability

David. No one truly knows for sure whether the private equity industry, broadly defined, has grown too big for its own britches, as it very clearly did in hindsight toward the end of the 1990s. What we can say for sure is that certain developments have occurred of late in the private equity arena that, if the past serves as reliable prologue to the future, constitute yellow if not red flags for institutional LPs seeking to generate materially better returns than they can earn from marketable stocks. For example, the demonstrably successful private equity firm headed by Wilbur Ross recently sold itself to a much bigger firm that is engaged in multiple forms of investing on terms that link the ultimate sales price not primarily to future returns generated by Ross and his team, but rather to the number and size of partnerships it's able to form in the future. Your firm, Greylock, has been extraordinarily disciplined about the rate at which it absorbs both new limited partners and fresh capital. What I'd like you to do at the outset is share your views on the past, present and projected future size of the private equity industry, keeping in mind that for most folks in the room the objective in allocating capital to private equity managers is to outperform more liquid forms of stock investing by a material margin net of the incremental costs.

Bill. You done?

David. I am!

Bill. I'll start with some background and perspective on the industry as I see it, and then I'll try to get into Wilbur Ross and Greylock more specifically. There's a problem that I see that's structural to our business; perhaps it's one that many of you have experienced. Here's the scenario: an investment committee is sitting in a room, trying to figure out how to snag superior returns for their endowment. The committee's been given various charts and graphs which attempt to show how each asset class is going to behave in the future. In one diagram, there are many dots clustered neatly around a curved line and a couple of dots that stray above the line. Because of their seemingly obscure placement, your eye is drawn to those dots, which represent investments where you'll get more return for less risk. Private equity is always reflected in one of those dots. I think all around the world, every investment committee is saying, "I've got to get me some of that, right? It's a great way to get a lot of return for not much risk!" But I think investment committees tend to forget that the people who supply this information tend to be the same people who sell private equity. The structural problem in this business is that everybody thinks private equity is the best way to get terrific returns with lower volatility, which can't possibly be the case when everybody is exposed to the same data and making the same decisions.

I'll now separate private equity into venture capital and buyouts. Today, buyouts are synonymous with private equity because the buyout business dwarfs venture capital. If you look at venture capital over the last 15 years, the industry has been horrible. I don't have these numbers exactly right, but roughly $180 billion has been shifted into venture capitalists' hands since 1990, and roughly $180 billion has been distributed by them to their limited partners. So at first blush, we're all saying, "Wow, you put your money in, you get your money back – what a great proposition!" It's even a little bit better than that, because about $40 billion or $50 billion of that money is still at work in the portfolios, with our hope being that it will produce a strong rate of return. So this is something to play for. That's the proposition.

A clever consulting firm decided to study this in detail. It looked at the top 10 firms in the industry from 1990 to today. Each of the firms invested about a billion dollars, and each of them returned roughly $10 billion, which is pretty good. The consultant then did the math: 10 times $1 billion is $10 billion in cost; $10 billion times 10 equals $100 billion in returns. $180 billion in investments industry-wide, minus $10 billion in cost for the top 10 firms, equals $170 billion. But we've already accounted for $100 billion in gains – gains produced by the top 10 firms, give or take. So the whole industry, not including the top 10 firms, has returned less than 50 cents on the dollar. How can that possibly be a good value proposition? How can

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that dot above the line push those committees to put more money into venture capital? I haven't a clue, but that's the nature of our business today.

Another question is how much money the VC industry can handle. VCs as a group invest about $22 billion a year, which I think is two times too much. If we were investing $8 billion to $11 billion, I think you'd see a return distribution that would reflect some risk premium to public market investing. But because we're more than two times that optimum number, the whole distribution is shifted to the left. Venture capital is in deep trouble.

Let me shift to private equity and leveraged buyouts, where $200 billion will be raised this year, which looks miniscule when compared to venture capital's $22 billion. I don't understand the sustainability of the private equity industry simply because it involves buying public companies. Buyout firms pay a premium of around 30% or 40% to the public stock price and do stuff to the companies. In most cases, these firms work with the same managers who managed the companies before the buyouts occurred. They pay fees and dividends and go public again. Guess who buys the company the next time around? The same guy who sold it before. Buyout firms have been earning 50+% returns playing this game. I can't understand how it's sustainable. It's all about assets: gathering assets and collecting fees. We've tried very hard to resist this at Greylock. We don't believe the business scales; we have roughly the same size fund we've had for 10 or 15 years, roughly the same number of investment professionals and roughly the same investment rate. We'd rather earn an outstanding rate of return – or deliver alpha on a smaller amount of money – than try to scale up and become an asset gatherer.

David. Are **you** done?

Bill. I suppose so…

Leveling with Liquidity

David. Let's talk now about another troublesome aspect of venture investing, which is the troubling gap between reported returns and actual returns attributable to a problem that many of us confront on a recurring basis: the slippage between cup and lip respecting in-kind stock distributions. Many of you are familiar with the following problem: you put money into a successful venture fund; because it's early stage, its success becomes manifest years down the road when you receive in-kind distributions. The problem is two-fold: first, the venture capital manager is getting 20% of the profit based on the market price at the moment of distribution; second, the reported returns that then show up in PowerPoint presentations are based on that mark rather than on the prices at which LPs are actually able to unload their shares.

Bill. It **is** a problem, one rooted in the fact that many venture firms own large positions in illiquid companies. And we tend to be heavily involved in their management: we sit on the companies' boards, for example. We're in turn held responsible by the SEC as affiliates, so liquidity in our positions is not very good. What we do as an industry, then, is dump the problem on our LPs and let them deal with it. This is not good. An LP shouldn't tolerate receiving stock that isn't liquid.

This isn't a scandal, necessarily, but it's certainly a problem that VCs could take steps to mitigate. And it relates to something that's more obvious about venture capital, which is that we're not a very transparent industry. As an investor, you have very little idea of what we're doing. We like it that way! LPs don't truly know how we're spending their money, why we're making certain investments and the extent to which we're pocketing fees. Many venture capital firms never meet with their LPs, making it an industry that's not the most conducive to personal interaction or strong one-on-one partnerships.

David. It's a problem that, based on what you've already said, is never going to go away because it's the result of an imbalance between supply and demand.

Bill. Correct. The basic problem is that supply and demand are completely out of whack. I probably get a call a week from an LP who wants to invest $400 million or $500 million in Greylock. Our entire fund is $400 million, so the proposition is totally silly. It's all back to the exhibit with the stray point denoting venture capital. Venture capital or, more recently, timber!

David. Timber's a favorite of my next guest, Jeremy Grantham. He loves trees.

Bill. Why not? They grow every year!

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David. To a man with a hammer, every problem's a nail. And to Jeremy, every investment solution …

Bill. … is a tree.

David. Maybe.

Actively Fishing

David. Let's ponder the evolution of the VC business over the course of your career. You joined Greylock in 1984, right out of business school.

Bill. Correct.

David. The industry has changed materially since then. Here's my question: When did it become too big for its own good? It wasn't too big in 1984, and it wasn't too big in the early 1990s, which was a terrific time in hindsight to shift money into early stage venture.

Bill. The best way I can think of to answer your question is to discuss how my firm makes money for its clients. We do it in two ways. One is typical of many other investors in many other asset classes: to make sure we're looking in the right places. For us it's about domain, stage and geography, so we have to think about the differences between enterprise software and biotechnology, for example. We have to think about the differences between seed investing and later stage financings. We have to think about the differences between a company in the Bay Area and a company in Mumbai. We're paid to think about these nuances and to fish in the right pond.

The second part entails hands-on active management. When I joined Greylock, most VCs were focused on this second component. Everybody knew that IT [information technology] was growing and everybody knew that the medical business was important. But could you be a value-additive, company-building VC? Unfortunately, the active management component began to diminish in the mid-1990s, and as we moved into the late '90s, fishing in the right pond dominated.

After the Internet bubble burst, the industry started shifting back, and we're starting to see more of an emphasis on what I call the classic Greylock general partner – someone who can both identify the right industries to invest in and add value to the companies he or she chooses to finance.

To Invest or Not to Invest: China and India

David. I want to push back a bit because we see troublesome signs respecting both disciplines you alluded to – active management **and** being in the right pond. Consider the massive waves of money and people flowing into China and India. I know you've spent a lot of time in both, so let's talk about China and India for a spell. In your judgment, is it essential for VC firms like Greylock to maintain a permanent presence in China and India to do well over the next decade or two?

Bill. If the time horizon is decades long, Greylock certainly must be active in India and China. But we have to be careful. Today, India and China happen to be the soup du jour that everyone wants to consume. VCs as a group have a tendency to destroy opportunity by rushing in and overdoing it. This is precisely what seems to be happening in India and China. But to think about this over longer periods of time – decades for instance – we'll surely invest in India and China because our business is becoming global.

Some of our companies are going to sell into India, some into Europe and some into the United States. I want to optimize all of these centers of excellence, and I think that some industries – biotech for example – will be dominated by global expertise. Some biotech companies are doing very innovative work in China and India. At the Indian Institute of Technology in Bombay, they actually publish the ranking of where you graduate in comparison to your classmates. These graduates are the most competitive, brilliant, highly trained people in the world. We're going to have to be better here in the US to keep up with the rest of the world.

Diversity

David. You may regret having said what you just said, because it's a good segue into my next question. Given your extensive ties to Harvard, you're undoubtedly aware that the gentleman who recently left its presidency got himself into what one of my favorite sportscasters, cycling expert Paul Sherwen, would call a "spot of bother," by speculating on the reasons why women have made relatively small strides

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in science and mathematics. I'm going to give you the same opportunity to be diplomatic or provocative by asking you to discuss why the upper echelons of the VC industry comprise so few women. I pose the question now because you were just implicitly alluding to the growing diversity of the business. Why don't you broaden the question and talk not just about women, but racial and ethnic diversity also?

Bill. I think about this question a lot. When I joined Greylock in 1984 it comprised five white guys. If you look at Greylock today, we've got two Asians, two Indians and two Israelis in addition to many white Americans like me. This is not just diversity for diversity's sake. The expertise in our field is global; we want the very best people. We're not backing merely white guys over the age of 50 but rather world-class entrepreneurs. They come in every color and size, so it's very important that our team's composition reflects this.

There's nothing I'd like more than to have a couple of female general partners at Greylock. But there's a food chain here, and it's taken some time for women to move through the entrepreneurial, tech-oriented companies. In biotech in particular, there are many women partners in the venture industry. The head of development at Amgen for many years was a woman; the president of Vertex Pharmaceuticals was a woman; the head of neurodegenerative diseases at Biogen was a woman; and the head of clinical medicine at Millennium is a woman. In the IT sector, it's only a matter of time. This is probably in direct contrast to what I think Larry Summers was saying, although I guess we shouldn't get into that!

David. Yeah, let's not get into that.

Bill. Tempting though, isn't it?!

Lengthy Learning

David. Let me double click on the learning curve of a venture capitalist. There are a lot of people, myself included, who in our day jobs have to figure out which VCs have the potential to do uncommonly well moving forward. As you think about selection criteria for VCs, you can look at age, number of years in the business, prior background, industry, expertise and technological know-how. I want to focus on what you think constitutes the bare minimum number of years and deals that a VC would have to have under his or her belt to induce you to devote serious time to figuring out whether they have what it takes to be a first-rate VC.

Bill. It takes a long time. Venture capital is an apprentice business, especially when it comes to learning active management, which involves helping entrepreneurs and companies become leaders and winners. What does this entail? First and foremost, it entails hiring the right people. You have to develop a sense for what's good and bad, which is a highly specific skill. You have to fine-tune the questions you ask yourself when hiring people and think holistically when building a team, because chemistry is **very** important. Active management is the most time-consuming and challenging aspect of the business, which I think is a three- to eight-year endeavor that involves developing your reference point and fine-tuning your judgment.

Cutting Ethical Corners

David. When you're trying to figure out which management teams outside the US to back, you'll inevitably encounter people – just as you do within the US – willing to cut ethical corners. There's an acute problem with theft of intellectual property outside the United States, and a lot of fortunes are being built on that basis. How worried are you that people and management teams you're seeking to back outside the US have grown up in a culture where cutting ethical corners is the norm?

Bill. This is a **big** problem, especially in China and India. The Chinese way of doing things and the Indian way of doing things are very different – not better or worse – and people do not take the time to understand these differences but rather rush to make investments without learning what they need to know to make them wisely. There's no obvious answer to your question except to say that we need to be thoughtful about different cultures and take time to understand how they truly work. In the current environment, unfortunately, there's very little time to be thoughtful about this.

Destructively Deep Pockets

David. Let's discuss another potentially troublesome issue: the evolving environment for early stage VC

investing, particularly in the US, where we're starting to see more and more so-called angel investors. Not the types of thinly funded amateur VCs we saw 20 or 30 years ago, but rather truly wealthy folks with **very** deep pockets. Pierre Omidyar, for example, who founded eBay, throws $150 million a year at start-ups. Those start-ups – either because they perceive they're getting expertise from Omidyar or because the cost of getting capital from him is lower than it would be if gotten from firms like Greylock – go with Pierre's money rather than Greylock's. How big a problem is this?

Bill. Gigantic. Ten years ago, if you worked for a VC firm that had established itself, you could get entrepreneurs to accept your terms of engagement that maybe weren't as good as the next offer or the best offer because they were seeking to benefit from your active management skills. No more. In fact, due diligence is becoming obsolete in the start-up arena, due in large part to the arrival of deep-pocketed angel investors able and willing to put serious money to work without doing their homework. Very depressing.

Fun Stuff

David. How many hours a night do you sleep?

Bill. As much as I can, which is typically four or five. That's usually because I'm answering your emails late at night!

David. What's the best undergraduate major to prepare a young person to do what you do for a living?

Bill. I don't think it matters, but it's imperative that students learn how to think critically. I was a double history-math major. I hadn't quite focused on the fact that you needed to have a major, and I'd blown off my advisor for the first three years of college. He said to me after my junior year that I'd need a major to graduate, so we figured out how history and math could fit together. It worked out pretty well for me.

David. What's the best display of grace under pressure that you've witnessed in real time?

Bill. Entrepreneurs who want to change the world are the most passionate, driven men and women. I'm in awe of them and what they do every day. Greylock has investments in roughly 60 companies. The entrepreneurs I'm talking about tend to have all of their dough tied up in just one. Their entire lives are devoted to one company, and they pour their hearts and souls into it. I would give my vote to that group of people that I'm very lucky to work with every day.

David. Good answer.

Bill. Did it bring a tear to your eye?

David. Maybe. My final question is of course the baseball question I've posed to others here today: Red Sox, Yankees or don't care? But I'm going to do a little wind-up before asking you to answer it. Several people came up to me during the lunch break and asked, "Well David, what's your answer to the grace under pressure question?" I have several, actually.

Bill. These are people that don't know you, right?

David. I've been interested in this question for years. I first started thinking about it after the '76 Winter Games in Innsbruck. Remember Franz Klammer had the weight of the entire nation on his shoulders for the downhill? He just careened down that course and in four or five different instances was just about to lose it but brought it back and won the gold medal. That's when I first started thinking about this question. But of course more recently, particularly in the fall of 2004, there was Game Four of the 2004 ALCS. Who won that game, do you remember?

Bill. Was it Franz Klammer?

David. In any case, to thank Bill for his appearance here today, I thought I would give him this reminder of that memorable American League Championship Series. It has of course, the Red Sox logo and the Yankees logo. Game Four of course was the one won by the Bosox in 14 innings.

Bill. Who pitched, do you remember?

David. No I don't, actually. So, Red Sox, Yankees or don't care? Go ahead and give your answer.

Bill. I'm a gigantic – gigantic literally and figuratively – Yankees fan. I grew up in the New York City area and had my first entrepreneurial venture in connection with the Yankees. My friend and I used to walk out of games at Yankee Stadium, and we noticed

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something: lots of really thirsty people! Before one game, we went to a little convenience store and bought two six-packs of 7-Up and two six-packs of Coke, put them in a cooler and sold them for a dollar a can. We sold out in minutes, so the next time we got two coolers. The same thing happened, and we sold out in minutes. We continued to do this, and we kept selling out in no time. I then had what I think was one of my better ideas of all time. I figured that we couldn't carry more than two coolers with the two of us, so we needed to get more value per cooler. There was only one answer, of course. The answer, anyone? Budweiser! So we started selling beer at age 16, in the parking lot at Yankees Stadium.

David. Thanks for joining us, Bill.

JEREMY GRANTHAM

Jeremy Grantham co-founded GMO in 1977. He began his career as an economist with Royal Dutch Shell after earning his undergraduate degree from the University of Sheffield (UK). Prior to launching GMO, he was a principal at the Boston-based money management firm Batterymarch Financial Management. Excerpted below is an interview of Mr. Grantham by TEF president David Salem. Mr. Grantham's bio appears at www.tiff.org/TEF.

Beta Debunked

David. Let's talk first about one of the central tenets of modern portfolio theory: the notion that there's a positive relationship between a security or indeed a portfolio's non-diversifiable or systemic risk and its expected return. This is a relationship underlying the commonly held view that so-called high beta stocks outperform low beta stocks over time. If the well-known business school that's located across the Charles River from where we sit gave you a few minutes to tell its students everything they should know about beta, what would you say?

Jeremy. **That** well-known business school has actually given me a few minutes to talk each year for about 15 years. Fifteen years ago I went in with a decile run: every January 1 you took the 10% highest beta of the top 600 stocks and you redid this every January 1 for many years and accumulated it. We had a 30-year cumulative performance, with Decile 1 back in those days being something like +1,000%, Decile 2 around +900%, Decile 3 around +500% and Decile 10 being -25%. The students would all have a look at it and wouldn't think much of it. It was what they expected. But there's a snag: it was backward! The +1,000% was for the lowest beta 10% and the -25% was for the highest beta 10%. This was a long time ago, but if you did it again today, you'd get essentially the same result over the last 15 years.

This is an amazing little discrepancy, which Fischer Black highlighted in a footnote to a journal article way back in 1973. We actually modeled this in our quant funds for quite a few years before deciding that we could do better. We called it neglect. In other words, when neglected, low beta stocks outperform. So one of the problems is figuring out why beta works in reverse. Interestingly, if you extend this work to other quality measures, they too work in reverse – not just in contradiction to Cap M, but in contradiction to common sense as well. High quality stocks have beaten low quality stocks defined by high stable return and low depth; with individual components, low debt companies have beaten high debt companies in both total volatility **and** beta. Total volatility has underperformed low volatility, high profitability beats low profitability and stable earnings beat unstable earnings. It's a very strange situation, with the only exception being **liquidity**. It's hard to imagine a world in which illiquid stocks outperform, because illiquidity entails career risk. You need to know you can get out of your mistakes, and we're willing, as an industry, to pay a premium for liquidity. But for everything else, it works contrary to common sense – superficially anyway. The capital asset pricing model, for which Bill Sharpe famously received a Nobel Prize, doesn't work in the real world. As Mark Kritzman likes to joke, the real world is merely an inconvenient special case of the idealized model.

David. He's referring to **his** model, of course.

Jeremy. The reason that beta and these other characteristics don't work is that they're correlated with other characteristics – characteristics that are actually easier to understand. The central one is growth. There's a substantial positive correlation among high growth, high volatility and high beta. Why people overpay for growth stocks is easy to understand because these are often great companies like Microsoft, Coca Cola and Cisco. And when you're

talking to a committee, it seems intuitively appealing that these companies will keep growing because they have enduring franchises and will live happily ever after. Surely, one should pay up for that! They also have a record of survivability: in the Great Depression, Coca Cola-like companies did not go bust. You're therefore really getting something for your money. Growth companies also entail less career risk. If you're a growth manager and you fail with a portfolio of Coca Colas, you'll probably get more patience from committees. They're more sympathetic to the fact that when Coca Cola and Cisco underperform, they'll eventually catch up because the market's simply being a little silly at that moment. On the other hand, let's say you go out and buy General Motors today, and you come back in three years to find the company bankrupt. The committee's reaction is negative because it thinks it should've been blatantly obvious that GM was on the path to bankruptcy. At first glance, value stocks are not appealing because they involve more career risk. You won't buy them unless you think you're going to get a materially higher return – which you will! Decile 1, or highest growth, underperforms the broader market by slightly over 2% a year and the top half of growth underperforms by about 1.5%. Low growth value stocks outperform by 1.5% and are correlated with low beta. If you take the value stocks out and neutralize for the growth effect, the beta line becomes relatively flat. In fact, if you go out to two years from one year to get rid of some noise – price momentum, really – the line actually starts to slope in the correct direction. Of course, you still have to take other factors such as liquidity and information flow into consideration. Highly liquid stocks have a higher beta because liquidity is worth paying for, and some of the counterintuitive return is due to this desirable liquidity. High beta stocks include more information as well, which is reasonable to pay for. But there's also an option feature. If you decide to take a low beta portfolio and leverage it until it has the same **oomph** as a high beta portfolio, you'll likely lose. The broker could call at the least convenient moment in 1987, and you'll be out of business in minutes. But if you leverage only through having a high beta portfolio, you'll likely get to the point where you've **nearly** lost your shirt but are still afloat and able to fight another day.

You'll find, then, that beta is associated with too many seemingly good things, which is precisely why it works in reverse. Another common notion is that high quality, low beta companies are boring. Let's say you're standing outside Peter Lynch's office with the greatest idea you've ever had reflected in three different stocks: one's high beta, one's neutral and one's low beta. You're not going to risk your career on a low beta stock, which is going up less than the market, but rather you choose the high beta stock. There are plenty of reasons, however, that beta can fail miserably. Even at the asset class level, you cannot prove that there will be a higher embedded return for owning an emerging country equity than there is from owning a dopey Coca Cola stock. In fact, over the lifespan of emerging markets, which carry with them more volatility and risk, they will probably not outperform the universe of Coca Colas. The only time I can think of when beta is quite useful is in the short-term mixing and matching of portfolios at a short horizon, asset class level. In this case, beta can do a pretty good job of predicting how **bad** bad could be if you were to hit a credit crisis. And we do use it – somewhat ashamedly, I must admit – for that particular purpose.

David. I'm sure it's unsettling to folks who are focusing on this flaw in the capital asset pricing model for the first time, and it's perhaps more unsettling to contemplate that the entity that heavily controls what happens in the global economy – the US Federal Reserve – is relying on a model that you think is equally if not more flawed. Maybe you could talk briefly about the fundamental problem in the so-called Fed Model as it relates to price-to-earning ratios (P/Es)?

Jeremy. If you want brevity, you can't ask about beta! The Fed Model says that P/E is related to interest rates, which is historically incorrect. There are long periods of time – 10 or 15 years – when there's a positive correlation between interest rates and P/Es. There are also long periods of time when there's a negative correlation. If you take the longest time period available – the whole 20th century, for example – there's no statistically significant correlation between interest rates and P/Es, nor should there be. There's absolutely no reason why a nominal rate should relate to or explain the value of a real asset. Real assets, like stocks, should sell at replacement cost; in the longer run, if they don't, there's an arbitrage mechanism to correct it. If you can buy Union Carbide at half price for example, you will in turn buy your polyethylene plant at half price by buying Union Carbide – you

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wouldn't build a plant at twice the price. Do you think the replacement cost of a polyethylene plant materially changes when the Fed changes the Fed Funds rate? Obviously not! End of case.

Art, Science or Craft?

David. Like you, I get asked occasionally to meet with students at colleges and graduate schools to talk about what I do for a living. One question that comes up repeatedly is whether professional investing is an art, a science or perhaps a bit of both. I typically answer by saying that it's both of these things, plus something else: a craft. A craft in that this profession is one in which success depends in part on the willingness to show up at work, day after day, and perform competently the same tasks over and over again. Reflecting on your own work as an investment strategist, how much of it is properly characterized as art, how much is science and how much is craftsmanship, as I've just defined it?

Jeremy. Hmmm … that's a fun question. I had the opportunity to work with Dick Mayo for many years, and he was the ultimate craftsman. He came to work every day, having read a briefcase so heavy it would've given me tennis elbow. All day long he was glued to the computer and telephone, processing information every second of every day. He was absolutely, compulsively professional around the clock. I, however, belong to a much better school: the lazy man's approach to the investment business!

I recently compiled a report that sums up everything I know about the market. After 15 years, I truly think that generating one or two winning ideas per year is an optimal way to succeed as an investment professional. I believe, though, that hard work gets in the way of thinking a lot of the time. New ideas come from situations in which your feet are up and you're bullshitting with some friends, partly about the Red Sox and partly about investing. In an environment like this, occasionally a little gem will pop up out of nowhere. Nine out of 10 will lead you down a blind alley, but the 10th might be very useful. The whole essence of our industry is based on a few brilliant ideas – but ideas aren't useful if they're the same as those of the masses. One or two times a year you may have a genuinely good idea, and you must capitalize on it. Whether you call this art or science or craft, I'll leave up to you.

Fat Pitches

David. Your firm launched not long ago an interesting vehicle focused on so-called mean reversion theory. As I understand it, it's premised on the assumption that institutional investors seeking to deploy serious sums in a superior way could and should do the equivalent of what notably accomplished batters do in baseball, which is to wait patiently for a truly fat pitch and when it comes, swing like hell at it. My question to you about the mean reversion approach is a multi-part one. First, given it's intuitive appeal, why don't more institutions use it? Second, from a return enhancement viewpoint, isn't there some merit to leavening the mean reversion approach, which is very much value-based, with some kind of momentum screen? And third, what are you going to do if the thundering herd of investors actually climbs aboard the mean reversion bandwagon?

Jeremy. My belief in asset allocation is that the great opportunities are almost impossible to miss. Did anyone **not** see March of 2000? The S&P was selling at 33 times claimed earnings and 37 times revised downward earnings. The previous peaks on real earnings had been 21 in 1929 and 1965. So it was like a Himalayan peak suddenly rising up from the plain, and you couldn't miss it unless you were desperately trying to do so. I've made lots of big bets, and though they were nerve-wracking experiences, every one of them ultimately has ended up being right. The problem with mean reversion at extremes – so-called fat pitches – is that you can knock it out of the ball park when it finally arrives, but you have to wait many years for it to do so, by which time you've been fired. The key challenge, in other words, is to get back to trend with the same set of clients. In 1999 and 2000, we lost 60% of our asset allocation business in two and a half years. We lost 45% of all the dollars at GMO in a broadly diversified firm – and we lost them for making the right bets for the right reasons – bets that proved ultimately to be winning ones. We lowered the risk, increased the return and ended up with less business, or more business loss, than any of our competitors. That's the nature of our business. Because it is, there's simply no way everyone will jump on the mean-reversion bandwagon. It's impossible for a big profit-making company that needs quarterly earnings to make the kinds of bets that will win big in the long run but lose lots of business in the near term.

Momentum is very complicated, and we don't have enough time here today to discuss it in detail. But yes, I think you can blend effectively mean-reversion and momentum strategies. We use momentum for picking individual stocks, but we end up with a portfolio of 300 names: 200 of them are hard-core value stocks and 100 are momentum stocks. When you start buying an entire asset class that is overpriced because it's heading in the right direction, it doesn't feel right to me. This can be made to work if you do it every month with a separate bet – we call it tactical asset allocation – but it doesn't feel right in terms of long-term, strategic, value-based, risk-reducing bets. I think you can take some aspects of momentum and improve on what you do, but you have to be careful.

Managing Management Firms [sic]

David. I'd like to elicit your thinking on an issue you just implicitly referred to, which is the idea of independent money managers versus larger diversified firms. I've often wondered whether the clients of independent money management boutiques – I'm referring now to successful ones like GMO – might not be better off if the founders of those firms operated essentially in accordance with what government types call sunset provisions. Instead of focusing a lot of time and attention, typically in the second half of their careers, on how they can perpetuate the firms they've founded, they'd instead focus on doing their very best work with the notion that their clients will find safe homes eventually even if the firms themselves don't outlive their founders.

Jeremy. First of all, you'll have to explain to me what it could detract, because I'm not sure. Attempting to have a firm outlive you, what's the downside of that?

David. The downside is that the imperative of perpetuating the firm will prove so distracting that it will prevent its principals from producing the two or three good ideas each year that you spoke of earlier!

Jeremy. The building of a firm, which includes finding good people, ensuring diversification within the firm and producing good ideas all fall outside the portfolio. The reason we have a diversified firm is because we tend to generate a more or less continuous stream of good but inherently unrelated ideas. Often, you're sitting there with a portfolio or a variety of portfolios and you have a great idea that's unrelated to anything you're currently doing. There's no way you can torture it into the portfolio unless you start a new fund that does something different.

We live in a world where clients expect you to stay on course and follow through on what you say. You can't just take a fund and wander off to do something else. I noticed on a trip to California that on the agenda of a client we were visiting was the firing of a growth stock manager. The growth stock manager had underperformed for many years and was in really serious trouble. We discussed this and pointed out that growth stocks had become truly cheap for the first time in living memory. I then went to a second meeting at Pomona College and told them the story of the growth stock manager. They laughed and handed me a copy of their agenda, and sure enough, there was an item entailing the firing of their growth manager. I thought to myself, we better start a growth fund!

David. We're talking about the late 1980s here.

Jeremy. Yes, 1989. We started a growth fund. And then, two or three years later, another idea led us into asset allocation when it was the ultimate rat hole. I could cite other examples. At the peak of the tech stock bubble in early 2000, REIT yields rose above 9% – a screaming bargain.

This was what I described at the time as the biggest no-brainer of the entire cycle. We had to force ourselves into the REIT business, and the next thing we knew, we were talked into running a broad-based, global balanced fund – just before all hell broke loose in the stock market. Our strategy has always been to start all of these different funds when they're cheap. That's how you become diversified, which, I have to admit, is the fun part of this business. This, for me, is far from distracting – it's how I implement my best ideas.

In terms of the setting sun, we have a formula. Imagine a world in which the sun sets asymptotically toward the horizon, meaning that it goes down slower and slower but never actually reaches the horizon except at infinity. The two founders who are left put 4.3% of what they own into the pot, along with everybody else in the firm, and we continue to do so every year. Every 10 years, 43% of our firm changes hands. It's not bought or sold, it's transferred on merit to the newbies. Someone arriving 30 years later will have seen well over 80% of the firm change hands, which is much more like joining a new firm than an old firm.

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Yet for a founder, as long as the firm can grow at 4.3%, we have a growing stream of income. That seems like a nice compromise.

Knowing When to Stop

David. If you're running a firm where – and I think this is demonstrably true even though it may sound sycophantic – you're always serving the client's interests first, you may run squarely into the problem of size. Sizing a money management organization has to be driven in very large part by perceived liquidity, which varies over time. Can you execute your ideas? Can you get in and get out? How do you go about the problem of sizing your firm for optimum performance?

Jeremy. It's not easy. We now have 45% of our book of business closed. In three years, if we do well in international and global equities, I think we may have 80% closed. The cutoff we use respecting liquidity is roughly 1% of a company's market cap. If the median position in your fund is 1% of the company, this is a decent size piece and it may be prudent to quit while your size is optimal. If you grow, you'll have to field a second team or buy twice as much as your first team. Instead of buying 10% of the daily trading volume for 20 trading days, you'll buy 20% of the trading volume for 30 days, 50% of the volume for 40 days, and pretty soon even the best idea will be pushed and pushed until your four-point alpha has become -1. The Peter Principle is very prevalent in our industry. Do well with $5 billion, and they'll give you $50 billion. Sooner or later, you **must** stop. The fact that people don't cap their assets under management at reasonable levels provides a big competitive advantage for those who do!

The Green Truth

David. Speaking of trying to unload large blocks of stock, I'd like to get your thoughts on Warren Buffet's big gift of Berkshire shares to the Gates Foundation.

Jeremy. There's nothing bad to be said about it with the possible nitpicking exception I'm about to make. I'm a **very** green environmentalist, and I believe that the planet suffers hugely from mankind's abuse of it: earth would be doing just fine if man weren't around to mess it up. Unfortunately, the great work of Bill Gates now reinforced by Warren is that if they succeed, there will be another couple hundred million people living on earth in 50 years who wouldn't have existed otherwise. I feel it would be reasonable and responsible for Bill Gates to spend some time and money helping the environment balance the shock of another couple of hundred million people bearing down on a planet designed for substantially fewer humans than we already have.

David. This is an issue that you and I have discussed offline. If you could wave a magic wand and take a portion of the very large fortune that Mr. Buffet is turning over to Bill Gates and spend it in the manner you just described, what would you do with that money in order to address some of these environmental problems?

Jeremy. The main thing I think we've fallen short on is propaganda. We've allowed the "pro-industrial growth at any cost" argument to dominate the propaganda battle. Even something agreed upon by 99% of serious scientists, like global warming, can be deliberately muddied by running a couple of op-ed pages simultaneously with the opening of Al Gore's movie, *An Inconvenient Truth*, in the *Wall Street Journal*. It's very easy to create doubt in reasonable people, and I think the best use of the money you alluded to in your question would be to find ways of getting the simple truth across to ordinary people so that the story isn't muddied by propaganda.

There aren't many movies based on statistics – for the very good reason that it's impossible to imagine such a movie being watchable. But I think Al Gore's movie has indeed pulled it off – it's very watchable and it hammers the truth home.

Paradigm Shift?

David. Let's turn to the not unrelated topic of oil prices. I'll frame the question for you in the following manner. Much of your work as a strategist over the entirety of your career has focused on mean reversion economic bubbles. I think you've identified roughly 30 bubbles through recorded economic history, and unless I'm wrong, the only one that you've conjectured isn't a bubble but rather a paradigm shift is what we've seen recently with respect to inflation-adjusted oil prices. Could you share with us your view of where oil prices have been, where they might be headed and what the implications are for a truly long-term institutional portfolio?

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Jeremy. For 100 years, from 1873 to 1973, oil traded around $16 a barrel in 2006 dollars. It's almost suspicious when you look at the trend line price for 100 years, and it's only broken out of a two standard deviation band on a few occasions. It broke out in the 1970's, due to OPEC, with the long-term trend line jumping to about $36 a barrel in today's dollars. It peaked at $80 a barrel in today's dollars in 1980 then sank all the way back to $16 for about a nanosecond in 1999. Going back to $16 made it look like it was moving back to the old trend, but it was actually super-depressed around a **new** and much higher trend line, one well above $16 in today's dollars. As if to prove it, oil promptly leapt from $16 up to $79 again.

The plain and obvious fact is that oil is a finite resource. And there's been a chronic lack of decent energy policy by major players. The average energy efficiency of American cars today is less than it was in 1980, which is such a horrific fact that you have to say it a few times before you get the full impact. If we're so concerned with our overdependence on OPEC oil, it seems ludicrous that we would cheerfully allow a policy that results in the average passenger vehicle getting fewer miles per gallon than it did 25 years ago. This confluence of bad policy and a finite resource – we will eventually pump the last barrel – makes oil a wonderful candidate for a paradigm shift, and I believe its long-term average price per barrel may be in the process of making another jump to something like $45 in current dollars. In 30 years, I'll come back and tell you if I'm right.

Quant Shop Demographics

David. In your opinion, what undergraduate major constitutes the best preparation for your line of work? What backgrounds are you looking for when you recruit for GMO?

Jeremy. Now that Dick Mayo has left, we're basically a quant shop. About 75% of our hirees are quants with PhDs in particle physics or something along those lines. For the remaining 25%, we try to hire human beings, which is an insult I'm happy to use internally as well as externally. Undergraduates with a brilliant track record who have taken a couple of courses on the stock market and have impressed their professor with a natural aptitude to ask penetrating questions is what I like to see. That's a winning mix to get the job done. In terms of undergraduate degrees, I think old-fashioned economics that involves free-ranging thought and politics rather than econometrics is great. But math-heavy economics is still a pretty useful undergraduate subject as well.

Gold Medal Grace

David. Final question: what's the single greatest display of grace under pressure that you've witnessed in real time?

Jeremy. A British rower, Steven Redgrave, has won five gold medals in five different Olympics. Redgrave, when getting out of his boat at the end of his last gold medal-winning race, was grabbed by a reporter who badgered him with the usual question, "So how do you feel having won your fifth gold medal?" His response was classic: "How do I feel? I feel absolutely knackered," by which he meant exhausted to the point of death. He then said, "And if anyone sees me go anywhere near a boat in the future, please shoot me!" It wasn't really grace but rather humor under pressure, and I've always preferred humor to grace, I'm afraid.

David. Thanks for joining us, Jeremy.

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