Alternative Investment Analyst Review

Editor's Letter

Global Supply of Alpha

Where does alpha come from? By alpha, I mean the rate of return generated by an investment in excess of what is justified by the risk exposure of the investment. Consider the global market for all traded financial products: stocks, bonds, foreign currencies, derivatives, and so on. Let's call the value-weighted portfolio of all these assets the Global Financial Portfolio (GFP). Note that the GFP is value weighted, and, therefore, will have zero allocations to investments that are in zero net supply – derivatives. Then consider the entire pool of investors who hold any piece of the GFP, and put them into two distinct categories. The first group consists of the buy-and-hold investors, who, as the name implies, buy and hold a piece of the GFP. The second group consists of all active investors, who, for some reason, decide to change their allocations to the GFP over time.

It is a fact that the total rate of return earned by the entire group of active investors cannot exceed the rate of return earned by the buy-and-hold investors over any time interval. It is a matter of simple arithmetic. Active investors can only trade with other active investors, as buy-and-hold investors are no longer in the market once they have created their portfolios. Another fact is that once fees are taken into account, active investors, as a group, must underperform the buy-and-hold investors. Also, we must note that fees become increasingly important as we look at the performance over longer periods of time. Consider an investment that will grow at 7% per year gross of fees. Also assume that the fees on this investment are 1.05% (15% of the total return) per year. The future values of $100 after 20 years before and after fees are $387 and $318, respectively. While the net-of-fees annual return is 85% of the gross return, the future value of the net-of-fees investment is 82% of the future value of the gross-return investment. What does this mean? It means that probably more than 50% of all managers who are active in markets for traded financial products underperform the simple buy-and-hold strategy after fees. The degree of underperformance will be even higher if we consider the compounded return over an extended period. Does this mean that investors should avoid any investment in active strategies? If the net supply of global alpha is negative after the fees, should we just avoid any allocation to alternative investments, especially its active subset? The answer to this question, like many others in economics and finance, is "It depends on."

First, the fact that active managers, as a group, will underperform the buy-and-hold group does not mean that all active managers will underperform. Therefore, manager selection is extremely important. Of course, it is impossible for everyone to invest in the top quartile active managers. Someone must be investing in the bottom quartile managers. In addition, it is not very comforting, as past studies have shown that very few top managers display performance persistence. In short, the net global supply of alpha in

traded financial assets is negative, and top managers tend not to repeat. Therefore, most investors of active strategies should be prepared to be disappointed. Well, maybe.

Second, there are market participants who supply the market with alpha in exchange for a service. This source of alpha is most important in derivatives markets, where one counterparty expects to lose money on a transaction but is willing to proceed because he/she receives a tangible benefit – hedging a risk that will have a relatively high and negative impact on his/her welfare. For example, the corn farmer who wants to avoid the volatility in corn prices should expect to lose money on average when using futures contracts, knowing that his/her business will survive a sharp drop in corn prices. Or, consider the distressed securities strategy, where some investors are not willing or allowed to hold distressed securities. These participants sell their distressed securities below the fair price to people who are willing and able to carry the risk. This source of alpha does not appear to be very large and is primarily limited to markets where financial products are used to provide insurance, or markets where legal barriers prevent some investors from full participation.

Third, there is the supply of alpha by "dumb" buy-and-hold investors. Unfortunately, this group includes mostly small investors who follow a buy-and-hold strategy most of the time and then, at the worst possible time, decide to become active. Think of the individual investor who finally decided to invest in a dot-com firm back in 2000, or an investor who finally gave up and sold his/her shares back in 2009. This source of alpha could be large.
Finally, we have the biggest source of alpha, which comes from the creation of new businesses and new financial products derived from them. Notice that if a financial product has to be bought from someone and then sold to another person, the game of alpha will become a zero-sum game. However, when shares are acquired because a new business is created, then we do not have a zero-sum game anymore. A growing economy, where entrepreneurs are creating new products to satisfy the needs of the consumers, will be the biggest supplier of alpha. In the alternative investment world, private equity could be a big supplier of alpha - at least gross of fees.
In short, while the net supply of alpha for traded financial securities is indeed negative, it is possible for a group of active managers to generate alpha on a consistent basis, and I am not talking about managers who are uniquely talented. These managers are:

- Those who trade in markets where some investors' primary incentive is not to generate alpha (e.g., the corn farmer who trades corn futures, or the government that intervenes in currency markets).
- Those who trade against uninformed and unskilled active traders (e.g., the small investor who tries to time the market), or trade against investors who face legal barriers. Not

only will these unskilled or constrained investors provide alpha to other investors, but, more importantly, many of them may survive for a long period because they have other sources of income.

- Those who have access to new financial products that are created during the process of economic expansion and innovation.

This Issue of *AIAR*

In this issue of *AIAR*'s "What a CAIA Member Should Know," Eric Knight and Rajiv Sharma explain that over the last 10 years, institutional investors have moved strongly away from intermediated infrastructure investment towards a direct investment model. They argue that this model directly exposes investors to the underlying risks associated with managing and governing complex infrastructure projects. This is problematic since few institutional investors traditionally have the skills to manage these risks in-house.

In the article titled "How to Lose Money in the Financial Markets: Examples from the Recent Financial Crisis," Sebastien Lleo and William Ziemba ask "What makes financial institutions, banks, and hedge funds fail?" They argue that the common ingredient is over betting and not being diversified in some bad scenarios that can lead to disaster. Once troubles arise, it is difficult to take the necessary actions that eliminate the problem. Moreover, many hedge fund operators tend not to make decisions to minimize losses, but rather tend to bet more, doubling up, with the hope of exiting the problem with a profit. Incentives, including large fees on gains and minimal penalties for losses, push managers into such risky behavior.

Jeffrey Furst, CAIA, discusses the life cycle of hedge funds. The article points out that all companies pass through various stages of development over the course of their existence; each stage has unique characteristics and managerial focus that will reflect the current point in the firm's life cycle. The author argues that hedge funds experience a similar transformation, with incentives, opportunities, and risks evolving over time. Understanding the stages of a hedge fund's life cycle has important implications for investors.

In "Private Equity and Value Creation in Frontier Markets: The Need for an Operational Approach," Stephen Mezias and Afzal Amijee maintain that for private equity firms seeking to invest in companies in emerging markets, the operational value creation approach is in high demand, particularly in the Middle East North Africa (MENA) region. Building operational capabilities requires active investment in business processes, cultivation of human capital, and allowance for an extended time horizon, according to Mezias and Amijee. They argue that developing the knowledge and skills of local managers to deliver value from operations will not only result

in improved prospects for producing great companies, it will also help to advance human talent and organizational capacity in the region. In the long-term, the support of a new generation of business leaders could have a profound effect on the local economies, their competitiveness, and the overall integration of private equity markets in the MENA region.

Benton Gup offers his perspectives on money in "What is Money? From Commodities to Virtual Currencies/Bitcoin." After providing a short history of money, the article examines the pros and cons of Bitcoins and assesses the future of the so-called "cryptocurrencies."

This issue of AIAR contains an interesting interview with Brian Portnoy, the author of "The Investor's Paradox: The Power of Simplicity in a World of Overwhelming Choice." He sheds light on how an understanding of decision theory can help to inform better choices in financial investments and in life.

Finally, this issue provides our regular features of research results by Alexander Ineichen, CAIA, on momentum and by Mike Nugent and Mike Roth on the performance of private equity investments.

We are grateful to all of these authors for their insightful contributions to this issue.

Hossein Kazemi, PhD, CFA
Editor

Call for Articles

Article submissions for future issues of *Alternative Investment Analyst Review* are always welcome. Articles should cover a topic of interest to CAIA members and should be single-spaced. Additional information on submissions can be found at the end of this issue. Please email your submission or any questions to **AIAR@CAIA.org**.

Chosen pieces will be featured in future issues of *AIAR*, archived on **CAIA.org**, and promoted throughout the CAIA community.

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ABSTRACT: All companies pass through various stages of development over the course of their existence; each stage has unique characteristics, and the managerial focus will reflect the current point in the firm's life cycle. Hedge funds experience a similar transformation, with incentives, opportunities, and risks evolving over time. Understanding the stages of a hedge fund's life cycle has important implications for investors, including when to hire or fire a manager, and how to establish proper expectations for return, volatility, and correlation.

ABSTRACT: For private equity firms seeking to invest in companies in emerging markets, the operational value creation approach is in high demand, particularly in the Middle East North Africa (MENA) region. Building operational capabilities requires active investment in business processes, cultivation of human capital, and allowance for an extended time horizon. Developing the knowledge and skills of local managers to deliver value from operations will not only result in improved prospects for producing great companies, it will also help to advance human talent and organizational capacity in the region. In the long-term, the support of a new generation of business leaders could have a profound effect on the local economies, their competitiveness, and the overall integration of private equity markets in the MENA region.

ABSTRACT: Money in various forms has been in circulation since about 2200 BC. What constitutes money has evolved from commodities with intrinsic value, such as gold to fiat money that is backed by federal governments and is in wide use around the world today. Payments systems have also evolved to include credit cards, debit cards, and various forms of electronic remittances. Virtual currencies, such as Bitcoin, are the latest innovation. This article examines the pros and cons

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Retooling In-House Investment Teams Inside Institutional Investors: Three Perspectives on the Shift Towards Direct Infrastructure Investment

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1. Introduction

Since the global financial crisis, one of the most significant trends in infrastructure investment is the shift from indirect to direct investment by institutional investors. A number of factors are influential in shaping this trend, including greater scrutiny on the value for money from management fees, greater familiarity with infrastructure deal-making, and a more direct approach to managing risk. This shift has important implications for the management practices of in-house investment teams inside institutional investors. Specifically, it places greater pressure on in-house investment teams to become principal managers of construction and business risk. Secondly, it makes talent management – and, in particular, hiring expertise with direct experience in infrastructure development and management – an important strategic priority. Infrastructure is often characterized as a predictable asset class, yet individual assets can have the operational and budget complexity of some S&P 500 companies. To be successful in this changing market, institutional investors need to learn how to in-source the skills of effective infrastructure management and governance.

Drawing on extensive in-depth interviews with investors, lawyers, and project managers active in infrastructure investment in North America, Europe, and Australasia, we present findings on how direct infrastructure investment is changing the management responsibilities of in-house investment teams inside institutional investors. We report our findings through the perspective of three key players in infrastructure deal-making: government, in-house infrastructure teams, and investment partners. We examine the implications with respect to the need for the investor community to be more strategic in how it builds long-term operational partnerships with government and co-investors, and outline the changes to talent search and management inside in-house investment teams.

2. The shift to direct investment in infrastructure

Over the last decade, institutional investors have changed how they invest in this asset class (Clark et al., 2009, Clark and Monk, 2013a). Historically, most institutional investment in infrastructure was channelled through listed products (utility stocks or ETFs) and more recently through private equity-style unlisted managed funds (see Exhibit 1 for growth in the unlisted fund market since 1993).

However, since the global financial crisis, very large institutional investors have moved to become direct investors in infrastructure. Clark and colleagues estimate that there are approximately twenty large direct investors in infrastructure worldwide, consisting of large pension funds, sovereign wealth funds, and insurance service companies (Clark et al., 2013). They note that smaller investors still rely on the expertise of fund managers in order to access infrastructure investments. This shift to direct investment has significant implications for the management risks that these investors take on, as well as how they procure in-house or out-sourced talent to manage these risks.

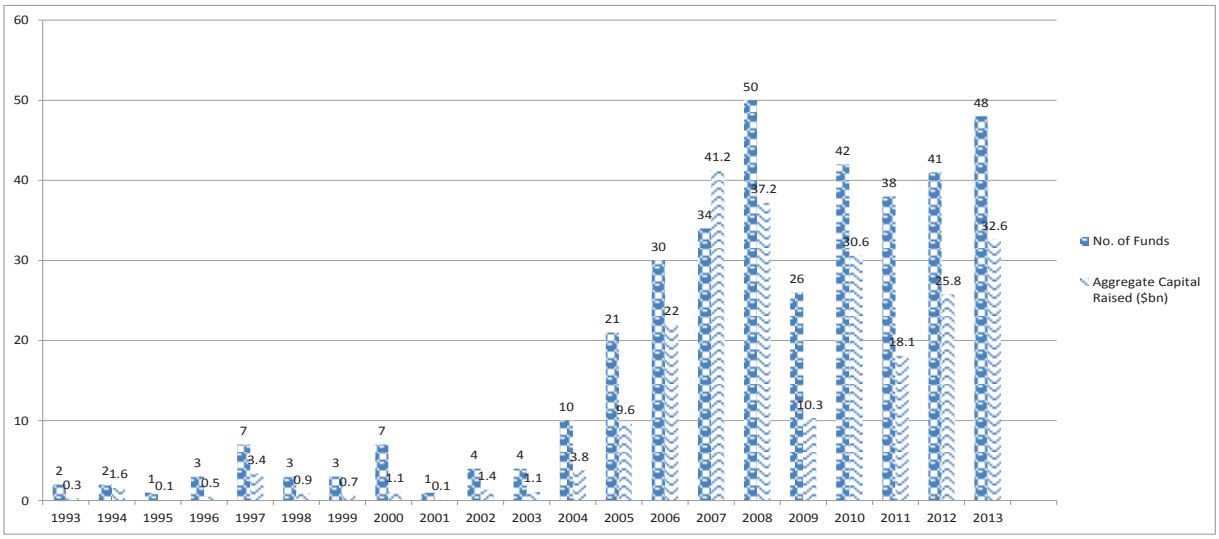

Exhibit 1: Growth in the Unlisted Fund Market
Source: Preqin 2013

Transaction cost economics tells us something about how firms make trade-off decisions to either in-source capabilities or out-source these services to the market (Santos and Eisenhardt, 2009, Williamson, 2008). Firms seek to minimize the cost of governing activities by paying attention to three considerations (Ellram et al., 2008). First, managers consider the frequency of transactions. Firms facing repeated transactions seek to in-source those activities to avoid management costs (Mcivor, 2009, Crook et al., 2013).

Second, managers consider the uncertainty attached to the required service. Where a task or service is clearly specified and easily described, firms prefer to out-source the function rather than in-source to reduce cost. Where there is technological uncertainty – for example, in providing expert building skills, or strategic consulting – firms prefer to out-source these to market (Judge and Dooley, 2006, Williamson, 2008). An exception to this is when supply relationships are characterized by behavioral uncertainty, in which case firms will find new partners or resources internally. Third, managers pay regard to vertical integration. Transactions or relationships that are highly integrated or interdependent may be managed internally to avoid misaligned incentives (Kalu, 2013, Clark and Monk, 2013b).

These three principles explain why the industrial firm and infrastructure megaprojects face different management challenges. Industrial firms face higher levels of complexity, and, therefore, seek extensive in-house capabilities. For example, industrial firms have a high frequency of transactions, and high levels of uncertainty as firms seek to respond to customer demand on a dynamic basis. Infrastructure projects, by contrast, take years to execute with relatively little change to the project plans (Salet et al., 2012). This should mean that industrial firms should have larger in-sourced capabilities compared with infrastructure projects, which can outsource well-specified tasks.

While infrastructure projects may be simpler to manage than industrial firms, the operational issues are still more complex than the traditional domain of investment companies. Indeed, as institutional investors move from being shareholders in infrastructure funds to being direct (or, in some case, sole) investors in infrastructure assets, they take over principal responsibility for the hiring and firing decisions of senior management and board-level appointments.

Exhibit 2 below depicts the key management roles inside infrastructure projects. Design and Construct (D&C) contractors design, build, and test the plans for the project and are engaged during the construction phase. These contracts take on the majority of the capital expenditure in the project and manage the complex relationships between suppliers, project managers, construction workers, and architects, among others. Once the construction phase is completed, Operate and Manage (O&M) contractors are hired to maintain the asset and collect revenues. For example, in a toll road, O&M contractors operate the toll booths and collect revenues.

Sitting above these two contractors is typically a small executive management team in charge of managing the overall project and contractual relationships, referred to here as 'ProjectCo' (Hayford, 2013). ProjectCo typically reports up to a board of non-executive directors (hereafter, 'the Board'). The Board has representatives from the equity investor side (here, institutional investors), as well as the project sponsor (in most cases, gov-

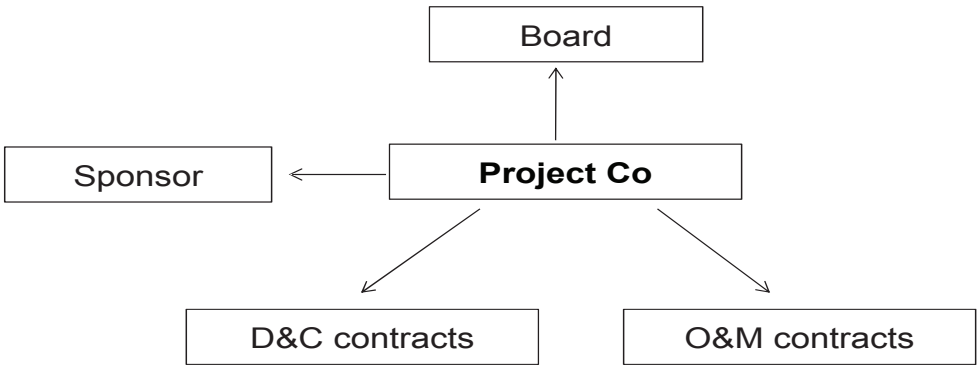

Exhibit 2: Infrastructure Project Finance and Management Team
Source: Author

ernment). Most infrastructure assets have remarkably small executive management teams (typically between 5-10 full-time employees). This is much less than the teams formed in industrial companies that might have budgets of a comparable size.

On one hand, this discrepancy can be explained by transaction cost theory, as complex work is out-sourced to contractors (Gil, 2009, Gil and Beckman, 2009). On the other hand, this places a greater premium on ProjectCo and the Board to manage contractors effectively and ensure that projects run on time, on budget, and on schedule. This is especially important in the absence of the type of deep executive teams that are present in S&P 500 firms. Recent research suggests that these management deliverables are hard to achieve, as the majority of major projects tend to miss key milestones (Berg and Marques, 2011, Clegg, 2008).

Between 2010 and 2014, we interviewed 50 investors, lawyers, and managers intimately connected in syndicating institutional investment in infrastructure. We asked them a series of questions around institutional investment in infrastructure, how direct investment was syndicated and managed, and the implications for talent strategies. We structure our findings around how the perspectives of government, project management executives, and co-investor partnerships are changing, and highlight the major implications for the in-house infrastructure teams that are situated inside institutional investors.

3. Role of government

The move to direct investment has placed greater emphasis on institutional investors to form strong working relationships directly with governments around new deal ideas. Many respondents noted that the limiting factor on deal-making was not a lack of available capital, but a scarcity of attractive projects. Many of the key terms that make infrastructure projects financially attractive may not be accepted by the project sponsor, which in most cases is a government. This means that institutional investors seeking to do direct investment need a globally networked investment team that can skillfully do due diligence on sovereign risk, as well as on-the-ground relationships to manage local contingencies.

For this reason, respondents cited the difficulty with doing infrastructure deals in developing countries despite the high infrastructure demand: "Developing countries can be risky because there could be changes to regulation overnight, and these investments are for 30 years plus." Developed countries also had sovereign risk, especially around brownfield infrastructure. These are projects that require redevelopment of an existing site. Respondents noted that the market had reached a saturation point where too much capital was chasing a small number of deals, driving the prices of assets up, and making the opportunity less attractive for institutional investors.

Governments typically form the over-arching sponsor for infrastructure projects. This means they have formal oversight over issues such as environmental approvals, planning permits, and design requirements, all of which have a material impact on budget and building schedules. This places a premium on investors being able to work with governments as day-to-day partners in operational issues rather than as passive investors as might be possible in index funds. As one lawyer noted: "government is ultimately responsible because it is managing this stuff in the public interest. If the toll road doesn't open, the government can't go to the public and say that it's not ready. It has to make sure this infrastructure is working."

The role of government as project sponsor complicates the management issues facing institutional investors because their incentives were not always aligned. For example, respondents noted that government might push for changes to a project that enhances public interest at the expense of return on investment. On the other hand, government was often willing to step in and support difficult projects in order to avoid public fall out. In order to manage this complicated relationship with government, respondents emphasized aligning early on what the investment role government sought to play. Respondents noted options that sat at alternate ends of the spectrum.

One model is to have the government as owner and operator. In this case, institutional investors provide debt financing to projects, whereas governments retain 100% of equity. This is a capital intensive approach for government to adopt, but works for long-term strategic assets. For example, respondents mentioned several real estate and port developments where this model had been pursued.

An alternative model is for institutional investors to provide both debt and equity investment, and for government to take demand risk. This reduces capital intensity for government, while giving investors certainty of future cash flows. This model is effective in projects facing high demand volatility, such as toll roads. During the global financial crisis, respondents noted that several privatized toll roads collapsed with little investment return to equity holders. This was because toll revenues did not meet expectation, forcing the project into a restructuring. As one infrastructure investor noted: "Toll roads have high volatility of revenues which is why you have seen the government come in with an availability fee. Now there is no market for greenfield traffic risk."

Availability payments are used in situations where the equity investors of a project may not be prepared to take on the traffic demand risk associated with a project. Traffic is very difficult to forecast on a new type of facility competing with alternative, parallel conventional infrastructure – a motorway in a dense road network for example, or a high speed rail line in a conventional rail network. In order to attract investors such as pension funds to invest in infrastructure projects, availability payments provide a mechanism for governments to help increase the appetite of these investors. Direct infrastructure investors need to build strong relationships with government agencies in order to gain access to preferential opportunities with favorable risk and return characteristics.

4. Role of management team

Besides managing the relationship with government, institutional investors are exposed to direct management risks due to the small executive oversight typically offered in the ProjectCo. Respondents note that it is easy to underestimate the management challenges associated with infrastructure. On one hand, some respondents argue that small management teams were justified by the relatively simple nature of infrastructure. As one investor noted: "A lot of infrastructure is a really easy business to run because it's just build it and run it. Take a toll road. Whether you are Albert Einstein or some idiot, you will still get the toll."

On the other hand, others argue that this underestimates the complexity inherent in managing infrastructure: "people like to think of infrastructure as this thing you build like a Lego block. What they forget is that it is human: it has all the behavioral complexity and uncertainty of any S&P 500 company."

Three aspects of the management challenge facing investors emerged from the data. First, investors find that the CEO of the ProjectCo often needs to be changed as projects move from the D&C to the O&M phases. In one large infrastructure project, the CEO was sacked after the board formed the view that he lacked the requisite building experience to manage infrastructure construction. He had been hired from a brownfield project that had involved complex stakeholder management. However, this presented different challenges to a greenfield project where the CEO had to be skilled in managing across detailed development and construction risks.

A second issue is the management experience of boards. As in equity investments, the board composition of infrastructure projects typically follows equity ownership, which means that institutional investors have an important say. However, respondents noted that not all institutional investor appointees have deep experience in infrastructure, having been placed there on the basis of broader funds management experience. This means that they are poorly placed to scrutinize the specific issues presented by infrastructure such as looking for budget overruns and handling complex project management tasks. Certain institutional investors have a rigid structure, which limits their ability to make decisions in real time. In some cases, sovereign wealth funds do not have a local nominee on the board, preferring to run complex infrastructure projects entirely from offshore offices. As one investor noted, "It's hard to know how they have any visibility of what is happening because they are managing this remotely from (an offshore location), and have sacked all the existing resources."

Third, respondents noted that a lead indicator for skills shortages is when ProjectCo management teams have to outsource critical functions because of lack of resources or expertise. In one case, the ProjectCo had reverted to hiring 'independent verifiers' to scrutinize the D&C contractors. These verifiers were responsible for crucial functions such as quality checking, schedule monitoring, and risk assessment. This potentially presented conflicts of interest, as the market for independent verifiers was so small that the verifiers often had closer relationships with the D&C contractors than the institutional investors did. In addition, a number of respondents reported instances in which key risks were deferred to the government rather than the board for

final management. While the government had slack resources to manage strategic issues, it resulted in project delays and poor board oversight of overall risks.

5. Role of investment partners

Despite the shift to direct investing for institutional investors, there is still a large proportion of the infrastructure investor universe that must use intermediaries to deploy capital. This emphasises the need to 're-configure' the relationship between institutional investors and their investment partners for making infrastructure investments.

As institutional investment in infrastructure emerged in the early 2000s, institutional investors were happy to invest in projects through infrastructure funds set up by investment management firms and investment banks. However, certain investors have questioned the alignment of interest of their infrastructure fund managers with concerns over time horizon, fee structure, and use of leverage in investments becoming issues of contention between the two parties. Investors that we spoke to explained that management fees and other fund terms and conditions are the greatest concern for investors in the infrastructure asset class. Specifically, fund managers have used a private equity structure in the set-up of their infrastructure funds with a closed- end term of 10 years and an investment holding period of 4-5 years. Similarly, the fee structure has been based on the 2% management fee and a 20% carried interest performance fee that is typically seen in the private equity world. Infrastructure projects, in contrast to private equity investments, are much longer term in nature, often from 15 or 20 years to 30 years or more.

The risk/return profiles of many infrastructure projects are not similar to those of private equity investments, meaning that the fee structure employed should not be the same. Investors have stated that a much lower fee structure is more appropriate for infrastructure investments. The use of excessively high leverage and opaque financing arrangements for infrastructure investments were exposed with disastrous consequences in the wake of the financial crisis (Riskmetrics, 2008). Many investors were adversely affected as a result of the ill-discipline of infrastructure fund managers, further affecting their decision to shy away from similar products in the future.

The smaller institutional investors that still rely on investment managers are approaching their relationships differently. A shift in power towards investors in the relationship between managers and investors seems to be apparent, as fund managers at times, have struggled to raise capital compared to the period before the financial crisis. Investors are now demanding more favorable terms and conditions for infrastructure funds, such as management fees no greater than 1%, and open-ended, evergreen structures. On top of lower fees and longer time horizons, commensurate with infrastructure assets, investors are also looking at negotiating co-investment rights or separately managed accounts as a condition for investing in infrastructure funds. Investors are bringing more negotiating power to the table when dealing with fund managers. There are indications that the situation is improving, as one fund manager explains, "The industry is starting to consolidate and adjust to address investor concerns. Investors' understanding of the asset class has developed, making them more sophisticated in manager assessment and selection."

With many investors not having sufficient size to carry out direct investments, a remodelling of financial intermediaries or 're-intermediation' needs to occur to help facilitate the flow of capital into infrastructure assets.

For the large investors who can resource an in-house investment team, building relationships with other large investors is important. Respondents noted that this enables knowledge sharing and risk diversification. Some co-investment platforms and research clubs have started to emerge, including The Long Term Investors Club (Global), Pension Infrastructure Platform (UK), Global Strategic Investment Alliance (Canada HQ), and Fiduciary Infrastructure Initiative (USA). The importance of special-purpose conferences and collaboration platforms are increasingly being valued by investors as they provide intimate, closed environments for determining how and with whom to partner. This not only relates to the size of the investor, but also to the processes, organizational coherence, and people involved at the organizations (Clark and Monk, 2013b). As one investor mentioned, "You can tell quite quickly just from the personalities involved whether we would do a deal with that partner."

6. Conclusion and implications: the future of direct infrastructure investment

The topic of infrastructure investing is high on public

policy agendas worldwide. With the double dilemma of deteriorating infrastructure stocks and stretched public balance sheets, institutional investors will continue to play a significant role in the financing of infrastructure projects. This article draws on the experiences (and mistakes) of fund managers, institutional investors, and government entities involved in private institutional infrastructure investment over the last two decades.

With a large amount of inherent heterogeneity, the field of infrastructure investment must evolve. The perspectives here indicate that as large investors move towards direct investment relationships, the management and talent strategies of institutional investors will need to change. There is more pressure on building strong relationships based on trust, knowledge, and experience emphasizing the need for special-purpose roundtables and gatherings to enable these relationships to be formed and developed.

We highlight two implications for investment managers in particular. First, the involvement of government will remain significant. What is most crucial in this respect is defining early on, the specific function of the government for the investment as a project procurer, co-investor, or regulator. Clearly defined shareholder property rights should not be infringed upon by the government in order to keep attracting much needed private capital. Institutional investment into infrastructure cannot happen without the approval and sufficient supply of deal flow provided by governments. A transparent pipeline of infrastructure investment opportunities will signal a strong commitment and further enhance investor confidence in this area.

Second, attracting the right skill sets into institutional investor organizations is an increasingly important issue. Direct investment requires a skill set which is very different from traditional portfolio management, and closer to sector expertise and project management. Infrastructure has a large amount of behavioral complexity, requiring skilled managers to control stakeholder concerns while also mitigating development and construction risks. As investors shift their thinking from being passive owners to being operational managers, they minimize unnecessary costs connected to intermediaries with different financial incentives, and acquire better oversight of the underlying risks.

The shift towards direct investing provides an opportunity for financial intermediaries such as consultants, placement agents, fund of funds, and investment managers to rethink their business models in order to take advantage of a 're-intermediation' as opposed to a 'disintermediation' process.

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Rajiv has investment management experience working for venture capital private equity firm Oxford Capital Partners and London-based infrastructure/private equity advisory firm, Campbell Lutyens. Rajiv completed a Bachelor of Commerce and Bachelor of Engineering with first class honours from the University of Auckland.

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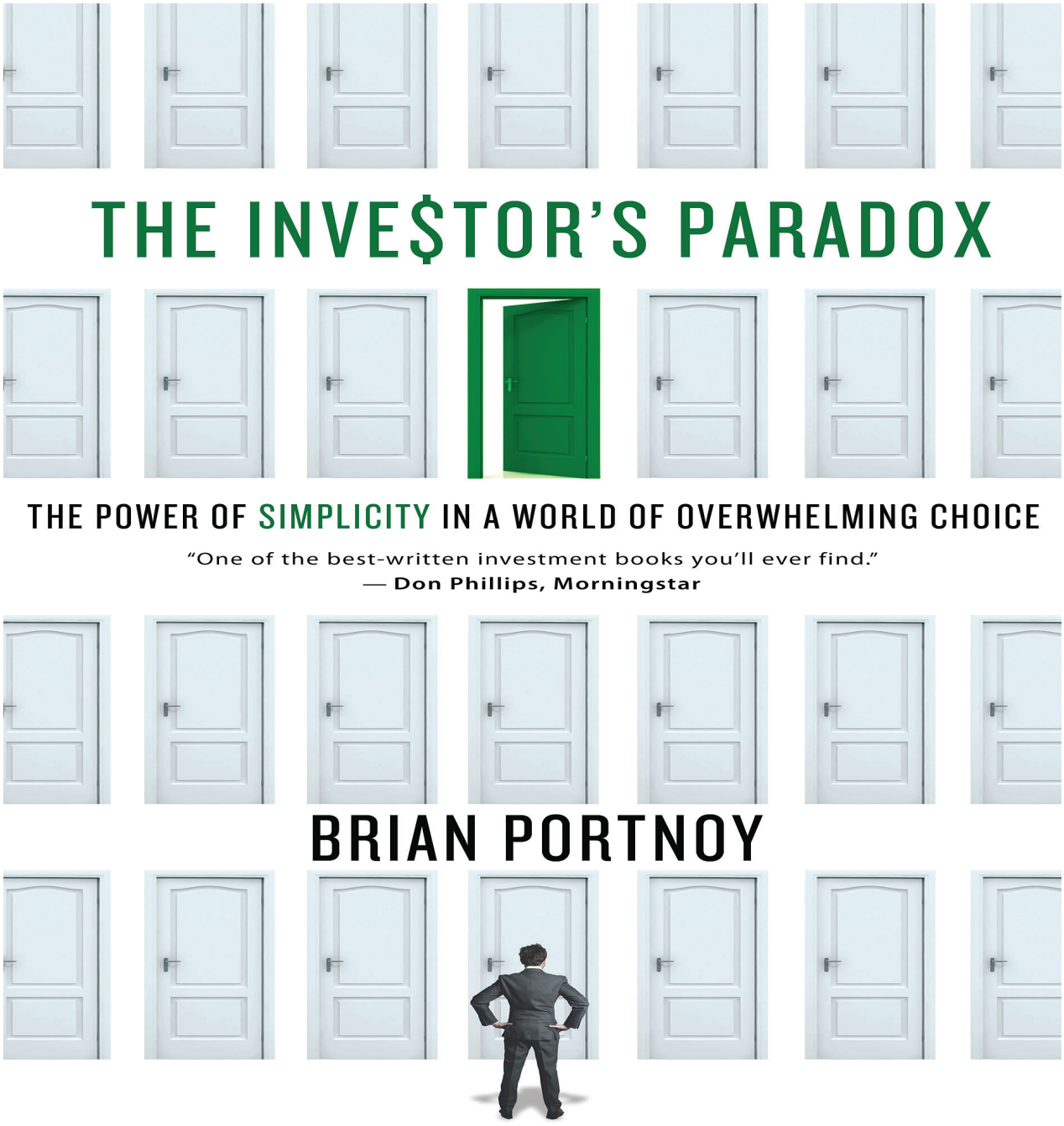


An Interview with Brian Portnoy about *The Investor's Paradox*

Earlier this fall, Barbra J. Mack, *AIAR* Content Director, spoke with author **Brian Portnoy** about his new book, *The Investor's Paradox: The Power of Simplicity in a World of Overwhelming Choice.*

BJM: So, I always ask authors what was the genesis of the book and their original concept with it.

BP: In 2010-2011, having been in the field of manager research and selection for more than a decade, I began to think more systematically about the career that I found myself in and actually, when I wrote the first line of the book on a napkin, it was "No one grows up wanting to do fund manager research." I have long been struck by the observation that manager selection is a sophisticated and difficult vocation that many highly educated people do for relatively high pay, but there are virtually no books on the topic, and certainly no undergrad or MBA courses on the topic, so the training that gets done is usually informal and the lessons of manager selection, if there are any, are folkloric or anecdotal. But if you think about it, most people who have investments don't buy individual stocks and bonds and build their portfolios that way - they own them by hiring money managers who then choose securities for them. Even so, there are thousands of books on stocks, bonds, portfolios, and risk, but there are close to none on how to do manager research. So, reflecting on that, I had an accidental, but very good experience of being on the long-only side at Morningstar for about four years, and then spent seven or eight years on the hedge fund side. I saw more similarities than differences in the world of manager due diligence. As I began to write down the lessons that I had learned over the years, the observations gradually blossomed into a book project.

The light bulb moment came about when, as I was writing what might have been destined to be a pretty boring book on manager due diligence, I was also reading a lot of books on decision theory and behavioral finance. One book in particular, *The Art of Choosing* by Sheena Iyengar, really moved me. It's a beautifully written book and covers many fascinating topics. Something clicked when I was reading that book and I saw that everything she was writing about related to what I had been doing, and presented an elegant framework to apply to my own work. So, I rethought the whole project and recast it under the banner of choice theory - it became a book about choices and decisions, with investing as a subset in that context, as opposed to being a straightforward book on investing.

BJM: That is a really fruitful marriage of two perspectives and your comments would steer people towards the Iyengar book as well.

BP: When I give speeches, I always joke that if you can only read one book on decision making, it should be hers, not mine!

BJM: There are some other great books out there too, like Daniel Kahneman's book, *Thinking Fast and Slow.*

BP: That is the Bible; it is an unbelievably good book and should be read first, because Kahneman and Tversky created the field of behavioral economics and brought decision theory into the field of economics and investing; so many people have followed on the back of their pioneering work. A lot of the basic principles that they wrote about 30 to 40 years ago are still being discussed today and basically what everybody is adding is just commentary and evidence, but not necessarily reinventing what those guys created. The 2011 publication of *Thinking Fast and Slow* was a watershed event, not only in academia, but also for investing practitioners who were given a wonderfully written book on thinking about the biases and heuristics that shape our decisions.

BJM: I checked online to see what the world was thinking about *The Investor's Paradox* and how the reviews have gone for you. When you have spoken to groups about the book, what have the reactions been?

BP: The reaction has been heartwarming – you sit by yourself for a couple of years and write and then when you put your book out into the world, you have no idea what is going to happen. Almost universally, the feedback has been very positive in several ways, because the book works on different levels and for different audiences by design. One of the stories I love telling is that when my wife, who is very bright but not a finance person, read the original manuscript. She said, "This is the first time since I met you that I find what you do for a living remotely interesting." That was the best compliment of all, because this is my first book and I hoped that it would be accessible to anybody who wanted to be thoughtful about these issues – that it would not be confined to finance practitioners and industry experts. The reaction from non-finance types has been fantastic - friends and strangers saying, "You put me in a posi-

tion to grapple with really complex issues that I generally find completely intimidating." It has been great to hear that.

On the professional side, for people in the industry and in particular, hedge fund managers, hedge fund investors, long-only traditional investors, and allocators, no one has ever stepped back and put all of manager due diligence into one overarching framework. So the feedback from the people running investment firms has been very positive in terms of saying, "Hey, this could really help me tell my story better." That's a great reaction, too, because it reads in one way as a book about how to choose the right investments, but if you read it from the perspective of the seller instead of the buyer, you get the same lessons in that, "Here is what the person across the table really cares about, even if they can't - or won't - articulate it for you and if you are going to build a sturdy investment business that does right by its customers, then abiding by these principles on how to communicate in a dynamic and adaptive market will serve you well." In the finance community, I have gotten a lot of comments from people that I've never met before saying, "We're kind of using this as the playbook for talking about our strategy." So, the reaction to the book has been quite good from both audiences.

BJM: It is amazing that the book has such diverse utility and manages to speak to those groups eloquently.

BP: The big thesis of the book is that success in much of life, including investments, comes down to managing expectations well. In investing, there are two sides to the table - there is the manager and the investor, the seller and the buyer. The reason I think that both sides of the table often have unsatisfactory experiences is that the communication between both sides isn't particularly effective, in no small part because people haven't been trained in how to communicate well, and I am not talking about making a more effective sales pitch. What I'm talking about is the manager putting the investor in a position not only to understand day one what they're buying into, but over time, through volatile markets and changing fortunes, to update those expectations in a way that people can continue to be on the same page. Even with a script, it's still very hard to do, but I don't think that most of the industry has even gotten to the starting line on thinking through the expectations management issues, or what I call expectations-based investing. The book, in some ways, was written to structure the dialogue between buyer and seller and the fact that it's couched in behavioral finance and choice theory actually makes it, not only more accessible, but frankly more interesting to a lot of folks. It's not technical – the only numbers in the book are page numbers. Skill in investment management is usually chalked up to a variety of statistical measures – that's not necessarily wrong, but it's incomplete. For me, skill is partly about so-called alpha, but it's even more about expectations management and the effective dialogue between the buyer and seller of complex financial products. That's a rhetorical problem, a communications problem, a discourse problem; that's not a statistical problem. So what I tried to do, and there is still a lot more work to be done, is to provide people with a beginning framework and the vocabulary to talk about that expectations management process, even with the basic four questions, "Can I trust you? What do you do? What are you good at? How do you fit?" Across 4,000 manager interviews in the last 15 years, those are the only four questions that I have ever asked. It can get so complicated so quickly, that you have to force yourself to stop and say, "What am I really trying to accomplish here?"

BJM: This touches on the behavioral economics, but also goes into philosophy and especially rhetoric, so I wonder, since you're obviously a voracious reader, what are you reading now?

BP: The best book I have read all year and possibly in the last few years is *Give and Take* by Adam Grant. That is a fabulous read - it deals with a lot of fundamental issues, not only in the work place, but in society as a whole, regarding reciprocity and trust - the proper and effective ways to deal with each other.

BJM: One book that I would throw out to you, after Nassim Taleb came out with *The Black Swan,* a fellow named Elie Ayache wrote *The Blank Swan: The End of Probability*. He was a trader, but is also seriously into Continental philosophy – it takes a long time to read a book like that, but it handles risk, contingency, and probability and how to take them apart from a deep philosophical standpoint.

BP: I will probably write a book dealing with risk at some point – these issues regarding both the mathematical and psychological characteristics of risk are fascinating. Another area that I am reading a lot in now is neuroeconomics. Below the level of behavior is the biology

and neurology of risk; a book by John Coates called *The Hour Between Dog and Wolf* won a lot of awards a year or two ago and it is fascinating. A few more great books that I have read in recent months are *The Most Important Thing, Illuminated* by Howard Marks, *Investing: The Last Liberal Art* by Robert Hagstrom, and *Pragmatic Capitalism* by Cullen Roche.

BJM: Besides reading and planning for the next book, what else are you working on these days?

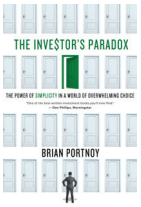
BP: I'm now a contributor for Forbes, which is fun and keeps my creative juices flowing. I am constantly taking notes on stuff and clipping things to Evernote. Right now, I have 12 or 15 different blog topics lined up, so it's good in terms of the longer view – what will congeal for the next book – but it's also good in the short term too. I can put out 1,000 words at a time on Forbes – test some ideas, and see what people think. I have also been spending time in the blogosphere, figuring out who's really good, and who I should be reading every day. There's some excellent stuff out there and it is truly amazing how productive some people are online.

You can read more about Brian's book, *The Investor's Paradox: The Power of Simplicity in a World of Overwhelming Choice* at http://us.macmillan.com/theinvestorsparadox/brianportnoy.

His blogs on *Forbes* may be found here: http://www.forbes.com/sites/brianportnoy/

Brian is also on Twitter: @brianportnoy.

Brian Portnoy, CFA, Ph.D., has worked in the hedge fund and mutual fund industries for the past fifteen years. He is currently the Director of Investment Education at Virtus Investment Partners, a distinctive platform of boutique investment managers, which offers access to a variety of investment solutions designed to meet a wide array of investor needs. In that role, Brian leads the firm's educational initiatives related to sound investing and effective decision-making. Previously he held senior strategy, investment, and research roles at Chicago Equity Partners, Mesirow Financial, and Morningstar. Brian has conducted more than 4,000 manager interviews during his career, which led him to write and publish his first book, *The Investor's Paradox: The Power of Simplicity in a World of Overwhelming Choice.* He also regularly contributes to both Forbes.com and Yahoo! Finance. Brian speaks about investing and decision-making to audiences all over the world, and has lectured on the history and future of hedge funds at the U.S. Securities and Exchange Commission as part of their Leading Authors series. Brian pursued his research and teaching interests in political economy at the University of Chicago, where he earned his doctorate. He earned his B.A. from the University of Michigan. Brian is a CFA Charterholder and a member of the Economic Club of Chicago.



The *Investor's Paradox* by Brian Portnoy was published earlier this year. The book covers the myriad possibilities that investors face in the global financial markets and offers insights on how to make the right choices by acknowledging and analyzing one's own subconscious biases and predilections. As Portnoy points out, access to a broad array of options does not always lead to the best outcomes. In fact, the more flexibility there is in a system of choices, the more overwhelming the decision-making process may be. The author draws on years of experience in investments to supply apt, insightful, and timely advice in the area of manager selection and offers thoughtful lessons that are highly applicable to life in general.

How to Lose Money in the Financial Markets: Examples from the Recent Financial Crisis

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1. Introduction

What makes financial institutions, banks, and hedge funds fail? The common ingredient is over betting and not being diversified enough in some bad scenarios that can lead to disaster. Once troubles arise, it is difficult to take the necessary actions that eliminate the problem. Moreover, many hedge fund operators tend not to make decisions to minimize losses, but rather tend to bet more, doubling up, with the hope of exiting the problem with a profit. Incentives, including large fees on gains and minimal penalties for losses, push managers into such risky behavior. We discuss some specific ways losses occur. To illustrate, we discuss cases from the recent financial crisis, including subprime mortgages. We also list other hedge fund and bank trading failures with brief commentaries.

2. Understanding how to lose, helps one avoid losses!

We begin by discussing how to lose money in derivatives, which leads to our discussion of hedge fund disasters and how to prevent them. The derivatives industry deals with products in which one party gains what the other party loses. These are zero-sum game situations. Hence there will be large winners and large losers. The size of the gains and losses are magnified by leverage and over betting, leading invariably to large losses when a bad scenario occurs. This industry now totals over $700 trillion, the majority of which is in interest and bond derivatives with a smaller, but substantial amount in equity derivatives.

Categories of Losses

Figlewski (1994) attempted to categorize derivative disasters and this article discusses and expands on that framework:

A. Hedge

In an ordinary hedge, one loses money on one side of the transaction in an effort to reduce risk. To evaluate the performance of a hedge, one must consider all aspects of the transaction. In hedges where one delta hedges, but is a net seller of options, there is volatility (gamma) risk, which could lead to losses if there is a large price move up or down and the volatility rises. Also accounting problems can lead to losses if gains and losses on both sides of a derivatives hedge are recorded in the firm's financial statements at the same time.

B. Counterparty default

Credit risk is the fastest growing area of derivatives and a common hedge fund strategy is to be short overpriced credit default derivatives. There are many ways to lose money on these shorts if they are not hedged correctly, even if they have a theoretical advantage. In addition, one may lose more if the counterparty defaults because of fraud or following the theft of funds, as was the case with MF Global in 2011.

C. Speculation

Derivatives have many purposes including transferring risk from those who do not wish to have exposure to it (hedgers) to those who do (speculators). Speculators who take naked unhedged positions make the purest bets and win or lose monies related to the size of the move of the underlying security. Bets on currencies, interest rates, bonds, and stock market index moves are common futures and futures options trades.

Human agency problems frequently lead to larger losses for traders who are holding losing positions that, if cashed out, would lead to lost jobs or lost bonuses. Some traders increase exposure exactly when they should reduce it in the hopes that a market turnaround will allow them to cash out with a small gain before their superiors find out about the true situation and force them to liquidate. Since the job or bonus may have already been lost, the trader's interests are in conflict with objectives of the firm and huge losses may occur. Writing options, and more generally selling volatility or insurance, which typically gain small profits most of the time, but can lead to large losses some of the time, is a common vehicle for this problem because the size of the position accelerates quickly when the underlying security moves in the wrong direction, as in the case of Niederhoffer (see Lleo and Ziemba, 2014a). Since trades between large institutions frequently are not collateralized mark-to-market, large paper losses can accumulate without visible signs, such as margin calls. Nick Leeson's loss in early 1995, betting on short puts and calls on the Nikkei, is one of many such examples. The Kobe earthquake was the bad scenario that bankrupted Barings.

A proper accounting of trading success evaluates all gains and losses so that the extent of the current loss is weighed against previous gains. Derivative losses should also be compared to losses on underlying securities. For example, from January 3 to June 30, 1994, the 30-year T-bonds fell 13.6%. Hence holders of other bonds lost considerable sums as well, since interest rates rose quickly and significantly.

D. Forced liquidation at unfavorable prices

Gap moves through stops are one example of forced liquidation. Portfolio insurance strategies based on selling futures during the October 19, 1987 stock market crash were unable to keep up with the rapidly declining market. The futures fell 29% that day, compared to -22% for the S&P 500 cash market. Forced liquidation due to margin problems becomes more difficult when others have similar positions, and in similar predicaments, this leads to contagion. The August 1998 problems of Long Term Capital Management in bond and other markets were exacerbated because others had followed their lead with similar positions. When trouble arose, buyers were scarce and sellers were everywhere.

Another example is Metallgesellschaft's crude oil futures hedging losses of over $1.3 billion. They had long-term contracts to supply oil at fixed prices for several years. These commitments were hedged with long oil futures. When spot oil prices fell rapidly, the contracts to sell oil at high prices rose in value, but did not provide current cash to cover the mark-to-market futures losses. A management error led to the unwinding of the hedge near the bottom of the oil market and hence triggered the disaster.

Potential problems are greater in illiquid markets. Such positions are typically long-term and liquidation must be done matching sales with potentially few available buyers. Hence, forced liquidation can lead to large bid-ask spreads. Askin Capital's failure in the bond market in 1994 was acceleterated because they held very sophisticated securities that were only traded by a few counterparties and contagion occurred. Once the buyers learned of Askin's liquidity problems and weak bargaining position, they lowered their bids even more and were then able to gain large liquidity premiums.

E. Misunderstanding the risk exposure

As derivative securities have become more complex, so have the requirements for their full understanding. The Shaw, Thorp, and Ziemba (1995) Nikkei put warrant trade (discussed in Ziemba and Ziemba, 2013) was successful because they did a careful analysis to price the securities fairly. In many cases, losses are the result of unsophisticated investors trading in high-risk financial instruments. Lawsuits have arisen where such investors attempted to recover some of their losses with claims that they were misled or not properly briefed on the risks of the positions taken. Since the general public, judges, and juries find derivatives confusing and risky, even when they are used to reducing risk, such lawsuits or the threat of them, may be successful in achieving some recovery for the investors.

One great exposure to risk lies in the extreme scenario, which investors often assume has zero probability when in fact a given event may have a low but positive probability. Investors are generally unprepared for interest rate, currency, or stock price changes so large and fast that they are considered to be impossible. The move of some bond interest rate spreads to 17% in August/September 1998 from 3% a year earlier led even savvy investors and sophisticated Long Term Capital Management researchers and traders down this road. They had done extensive stress testing with a VaR risk model that failed when the August 1998 Russian default (involving the extreme low probability event) took place, which was exacerbated by changing correlations. To avert this situation, one should use several scenario-dependent correlation matrices, rather than relying on simulations around the past correlations from a single correlation matrix. This is implemented, for example, in the Innovest pension plan model, which does not involve levered derivative positions (Ziemba and Ziemba, 2013). The key to staying out of trouble, especially with highly levered positions, is to consider the possible futures fully and to have enough capital or access to capital to weather bad scenario storms such that any required liquidation can be done in an orderly fashion.

Figlewski (1994) observes that the risk in mortgage-backed securities is especially difficult to understand. Interest-only (IO) securities, which provide the interest part of the underlying mortgage pool's payment stream, are a good example. When interest rates rise, IOs rise since prepayments are reduced and the stream of interest payments is larger. However, when rates rise sharply, the IOs fall in value like other fixed-income instruments because the future interest payments are more heavily discounted. This signal of changing interest rate exposure was one of the difficulties in Askin's losses in 1994. Similarly the sign change between stocks and bonds during stock market crashes has caused similar losses. Scenario-dependent matrices are especially useful in such situations.

F. Forgetting that high returns involve high risk

If investors seek high returns, then they will usually have to withstand some large losses. The Kelly criterion

strategy and its variants (MacLean, Thorp, and Ziemba, 2011) provide a theory to achieve very high long-term returns, but acknowledge that large losses will also occur. These losses are magnified with derivative securities and especially with large derivative positions relative to the investor's available capital.

G. How over betting occurs

Exhibit 1 shows how the typical over bet situation occurs, assuming that a Kelly strategy is being used. The top of the growth rate curve is at the full Kelly bet level, which is the asset allocation maximizing the expected value of the log of the final wealth, subject to the constraints of the model. To the left of this point are the fractional Kelly strategies, which, under a lognormal asset distribution assumption, use a negative power utility function rather than log. So αw^{α}, for $\alpha < 0$ gives the fractional Kelly weight $f = 1/(1-\alpha)$. So $u(w)$= -1/w corresponds to 1/2 Kelly with α =-1. Over betting is to the right of the full Kelly strategy and it is clear that betting more than full Kelly gives more risk, as measured by the probability of reaching a high goal before a lower level curve on the exhibit. It is in this area far to the right where over betting occurs. Virtually all of the disasters occur because of over betting.

Stochastic programming models provide a good way to try to avoid problems by carefully modeling the situation at hand and considering the possible economic futures in a systematic and organized way.

Hedge fund and bank trading disasters usually occur because traders over bet, the portfolio is not truly diversified, and then trouble arises when a bad scenario occurs. Stochastic programming models provide a way to deal with the risk control of such portfolios using an overall approach to position size, taking into account various possible scenarios that may be beyond the range of previous historical data. Since correlations are scenario dependent, this approach is useful in modeling the overall position size. The model will not allow the hedge fund to maintain positions so large and so under-diversified that a major disaster can occur. Also the model will force consideration of how the fund will attempt to deal with the bad scenario because once there is a derivative disaster, it is very difficult to resolve the problem. More cash is immediately needed, and there are liquidity and other considerations. Ziemba and Ziemba (2013) explores such models more deeply in the context of pension fund as well as hedge fund management.

Litzenberger and Modest (2009), who were on the firing line for the LTCM failure, propose a variation of standard finance CAPM type theory modified for fat tails and C-VaR or expected tail losses for the losses. Ziemba (2003, 2007, 2013) presents an approach using convex risk measures and three scenario-dependent correlation matrices depending upon volatility using stochastic programming scenario optimization. Both of these approaches would mitigate such losses. The key is to avoid over betting, to have access to capital once a crisis

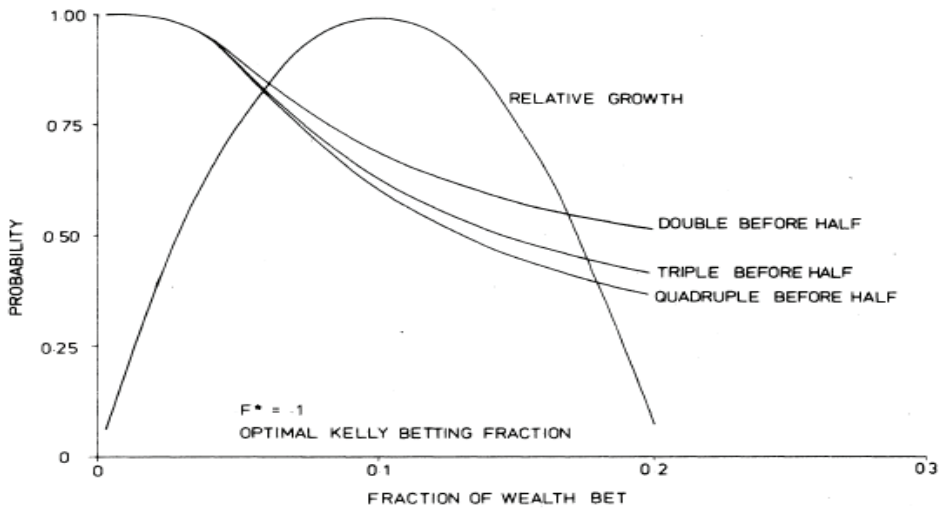

Exhibit 1: Relative growth and probabilities of doubling, tripling, and quadrupling initial wealth for various fractions of wealth bet for the gamble win $2 with probability 0.4 and lose $1 with probability 0.6.
Source: MacLean, L.C., Ziemba, W.T., and Blazenko, G., "Growth Versus Security in Dynamic Investment Analysis." *Management Science* 38.11 (November 1992).

occurs, and to plan in advance for such events.

3. Possible utility functions of hedge fund traders

One way to rank investors is by the symmetric downside Sharpe ratio (DSSR) (Gergaud and Ziemba, 2012). By that measure, investors with few and small losses and good-sized gains have large DSSRs. Berkshire Hathaway has a DSSR of about 0.917 for the period 1985-2000. The DSSR of both the Harvard and Ford Foundations endowments were about 1.0. Thorp's Princeton Newport's 1969-88 DSSR is 13.8. Renaissance Medallion, possibly the world's most successful hedge fund, had a DSSR of 26.4 during the period January 1993 to April 2005. See also the other funds in the CISDM hedge fund data studied in Gergaud and Ziemba (2012).

The results come from the choices made using a utility function. Those seeking high DSSRs are investors who are trying to have smooth and good returns with low volatility and very few monthly losses. Thorp only had three monthly losses in 20 years; the Harvard and Ford endowments and Berkshire Hathaway had two, three, and four per year respectively.

Consider a rogue trader's utility function. The outcome probabilities are:

1. x% of the time the fund blows up and loses 40%+ of its value; the trader is fired and gets another trading job, keeping most past bonuses.
2. y% of the time the fund has modest returns of 15% or less; then the trader receives a salary but little or no bonus.
3. z% of the time the fund has large returns of 25% to 100%; then the trader gathers more assets to trade and receives large bonuses.

At all times, the rogue trader is in (1) or (3), that is, the total positions are over bet, not diversified, and move markets. There is no plan to exit the strategy since it is assumed that trades can be made continually. In a multi-period or continuous time model, it may well be that for the fund manager's or trader's specific utility functions, it is optimal to take bets that provide enormous gains in some scenarios and huge losses in other scenarios. Kouwenberg and Ziemba (2007) show that in a theoretical continuous time model with incentives, risk-taking behavior is greatly moderated if the hedge fund manager's stake in the fund is 30% or more.

In the case of Amaranth Advisors (2006) and similar rogue trading situations, there are additional complications such as the fund manager's utility function and his wealth stake inside and outside this fund. Then there is the rogue trader's utility function and his wealth inside and outside the fund. According to Aumann (2005) in his Nobel lecture: a person's behavior is rational if it is in his best interests, given his information. Aumann further endorses the late Yale Nobel James Tobin's belief that economics is all about incentives. In the case of Brian Hunter at Amaranth, his share of $1B plus gains (real or booked) was in the $100 million range. What is interesting, and this is similar to LTCM, is that these traders continue to increase bets when so much is already in the bank. Recall in LTCM, that they had obtained a $100 million unsecured loan to invest in their fund. Finally, in such analyses, one must consider the

The trading losses at Societe General are not unique, but they are among the biggest ever disclosed. Here is how they compare with other examples:

BANK/FUND TRADER	AMOUNT, IN BILLIONS YEAR	TYPE OF TRADING	OUTCOME
Société Générale Jerome Kerviel	$7.2 2008	European index futures	The bank is seeking a capital infusion.
Sumitomo Corp. Yasuo Hamanaka	$2.6 1996	Copper futures	Hamanaka pleaded guilty to fraud; Sumitomo paid a $150 million fine.
Barings Bank Nicholas Leeson	$1.4 1995	Japanese stock futures	Barings collapsed and was sold to ING; Leeson went to prison for 4 years.
Daiwa Bank Toshihide Iguchi	$1.1 1995	Bond trading	The bank was banned from doing business in the United States; Iguchi pleaded guilty to fraud.
Allied Irish Banks John Rusnak	$0.7 2002	Currency trading	Rusnak pleaded guilty and was sentenced to 7.5 years in prison.

Exhibit 2: Rogue traders, trading losses, and outcomes
Source: *Wilmott* magazine

utility functions and constraints of the other investors' money. In the case of Amaranth, Deutsche Bank, which had first-hand knowledge of Hunter's previous trading blowups, was an investor along with other well-known firms.

4. Financial disasters before the 1980s

Crises of various kinds for earlier periods of time going back many centuries are discussed in Kindleberger and Aliber (2011) and Reinhart and Rogoff (2009). Harvard Economics Professor Joseph Schumpeter had suggested that recurrent mania is simply a normal feature of business life. Notable blowups include Goldman Sachs Trading Company with a late 1928 stock price of $104, rising to $222.50, and down to $1.75 by 1932. Irving Fisher (the distinguished Yale Economics Professor) stated in 1929, "stock prices have reached what looks like a permanently high plateau" just prior to the big crash. He lost millions, but Yale rescued him.

Harvard Economics Professor John Kenneth Galbraith (1994, 2009), an astute observer of economic crises from his research and government service, offered some general comments regarding these crises:

- A notoriously short financial memory of twenty years or less creates the conditions for a market collapse.
- The critic must wait until after the crash for any approval, not to say applause.
- Common features of great speculative episodes include specious association of money and intelligence; money is the measure of capitalist achievement, financial genius is before the fall.
- Something new: reinvention of the wheel over and over again, often in a slightly more unstable version.
- Debt is secured by real assets.
- Leverage is extreme.
- After the crash there is anger towards those previously most admired and scrutiny of the previously much-praised financial instruments and practices; there is also talk of regulation and reform.
- Not discussed is the speculation itself or the optimization behind it.
- The reality is all but ignored.

Litzenberger and Modest (2009) mention other trading losses and financial crises. Bad judgment, difficult times, and various levels of secrecy bordering on or actually constituting fraud are rampant in some cases. In this section, we present a chronology of the major financial and trading disasters that have taken place since the 1980s.

5. 1980-2007: banks in turmoil, derivatives blowups, and rogue traders

Hunt Brothers (1979-80): Herbert and Nelson Hunt, the two sons of oil tycoon H.L. Hunt, took the view that the price of silver would greatly appreciate in the high inflation environment of the late 1970s. The two brothers used the futures market to physically buy large quantities of silver. Using their family's assets as collateral, Herbert and Nelson made the most out of the leverage afforded by the futures contracts, building their silver position to $4.5 billion and controlling up to two thirds of the world's silver market. The price of silver topped $50 per ounce. Eventually, the U.S. commodities regulators introduced futures trading curbs, effectively stopping the Hunt Brother from adding to their position. As demand dried up, the silver market stalled, and the Hunt brothers faced mounting margin calls. At first, the brothers met their margin calls by borrowing against their family's assets. However, the Federal Reserve intervened, persuading banks not to lend money to speculators. Having lost the ability to borrow, the Hunt brothers eventually missed a margin call on March 27, 1980. The silver market collapsed from $48.70 per ounce to a low of $11 per ounce.

U.S. Savings and Loan Crisis (1970s-1995): U.S. savings and loans (S&L) institutions or 'thrifts' originate in the British concept of 'building societies'. They are regional institutions, whose primary purpose is to originate mortgages. From the 1930s onward, Regulation Q had prevented S&L institutions from offering competitive rates to their depositors. By the late 1970s, S&L institutions were under threat. Money market funds, which were not subject to Regulation Q, were able to take advantage of interest rate volatility to provide higher returns than S&L institutions and the S&Ls began to lose their customer base. To stay competitive, S&Ls made the case that they should be allowed to invest in a broader range of assets. Key parts of the regulatory framework were repealed, and S&L institutions began investing in riskier activities, making forays into commercial real estate loans and investing in junk bonds, and offering higher rates to their depositors. However, many S&L institutions had neither the expertise nor the manpower required to deal with these new types of risk. Up to a third of the 3,234 S&L institutions failed over

the period 1986-1995: 296 of them were closed by the Federal Savings and Loan Insurance Corporation (FSLIC) between 1986 and 1989 and a further 747 S&Ls were closed by the Resolution Trust Corporation between 1989 and 1995. The General Accounting Office estimated that the total cost of the cleanup reached $160 billion, including $132 billion paid directly by taxpayers. We refer the reader to the detailed account given by Pyle (1995).

Continental Illinois National Bank and Trust Company (1984): Continental was born out of the 1910 merger of two Chicago-based banks: the Commercial National Bank and the Continental National Bank. At the time of its collapse in 1984, Continental was the seventh largest bank by deposits in the U.S. with $40 billion in assets. A large part of the blame for Continental's insolvency may be attributed to the bad loans it had purchased from Penn Square Bank, which specialized in loans for oil and gas producers and service companies and investors in Oklahoma, after Penn Square's failure in July 1982. Continental's woes were compounded by fraud committed by a number of lending officers led by John Lyte. By May 1984, rumors of an impeding failure had reached large depositors. Withdrawals topped $10 billion (a quarter of all deposits) by early May. Fearing a generalized bank run, Federal Reserve and Federal Deposit Insurance Corporation (FDIC) intervened, injecting $4.5 billion of new capital. Continental, the original 'Too Big Too Fail,' remained the country's largest banking failure until Washington Mutual collapsed in 2008.

Black Monday (1987): World markets plunged on Monday, October 19, 1987. The Dow Jones Industrial Average fell by 508 points to 1738.74, a 22.61% drop. Futures contracts sank 29% after trading at a discount throughout the day. The Bondstock Earning Yield Differential (BSEYD) model predicted this in April 1987, based on high interest rates relative to stock earnings (Ziemba, 2003).

Drexel, Burnham, and Lambert (1990): Drexel, Burnham, and Lambert was the largest and most influential institution in the junk bond market. Several of its leading members were convicted in a massive fraud case involving insider trading, stock manipulation, and tax law violations.

Salomon Brothers Scandal (1991): Between December 1990 and May 1991, Paul Mozer, a trader at Salomon Brothers, submitted illegal bids for U.S. Treasuries with the objective of cornering the market.

Orange County (1994): Interest rate derivative losses. When asset market returns are low, it is often tempting to enter into speculative strategies or untested investment products in a bid to push returns up. Orange County in California did both, with devastating consequences. At the beginning of 1994, Robert Citron, Orange County's long-time Treasurer, was managing the Orange County Investment Pool with equity valued at $7.5 billion. To increase the fund's return, Citron decided to use leverage by borrowing an additional $12.5 billion through reverse repos, pushing the debt-to-equity ratio up to 1.67 and the financial leverage to 2.67. The assets under management, then worth $20 billion, were mostly invested in Agency notes with an average maturity of four to five years.

Citron's leveraged strategy can be viewed as an interest rate spread strategy on the difference between the four-year fixed investment rate and the floating borrowing rate. This strategy is akin to an investment in a floating note, or reverse floater. The underlying bet is that the floating rate will not rise above the investment rate. As long as the borrowing rate remains below the investment rate, the combination of spread and leverage would generate an appreciable return for the investment pool. But if the cost of borrowing rises above the investment rate, the fund would incur a loss that leverage would magnify.

Unfortunately for Orange County, its borrowing cost rose sharply in 1994 as the U.S. Federal Reserve Board tightened its Federal Funds rate. As a result, the Orange County Investment Pool accumulated losses rapidly. By December 1994, Orange County had lost $1.64 billion. This loss amounted to some 8% of the investment pool's assets and 21% of its equity. On December 6, 1994, the county declared bankruptcy and began liquidating its portfolio.

Jorion (1997) pointed out that Citron benefited from the support of Orange County officials while his strategy was profitable - it earned up to $750 million (a 10% return on equity) at one point. But he lost their support and was promptly replaced after the full scale of the problem became apparent, which subsequently resulted in the decisions to declare bankruptcy and liquidate the portfolio. The opinion of Miller and Ross (1997),

however, was that Orange County should neither have declared bankruptcy nor liquidated its portfolio. If the county had held on to the portfolio, Miller and Ross estimated that Orange County would have erased the losses and possibly even have made some gains in 1995.

Barings (1995): Nick Leeson incurred a $1.3 billion loss that bankrupted Barings PLC, a bank that had operated for well over 200 years. While based in Singapore, Leeson had accumulated long positions in Japanese Nikkei 225 futures with a notional value totaling $7 billion. As the Nikkei declined, Leeson hid his losses in a "loss account" and increased his long positions, hoping that a market recovery would return his overall position to profitability. However, on January 17, 1995, Japan suffered an earthquake in Kobe and the Nikkei declined by about 15 percent. Barings suffered a GBP $860 million loss, twice the bank's capital. Barings went bankrupt and was bought by ING for GBP 1.

Leeson's control over both the front and back office in the futures section of Barings Singapore was a leading contributor to this disaster because it allowed him to take very large positions and hide his losses. Another factor was the blurry matrix-based organization chart in use at Barings. In these charts, roles, responsibilities, and supervisory duties were not clearly assigned. This created a situation in which regional desks were essentially left to their own devices. Leeson went to prison in Singapore and now lectures for about £10,000 per talk.

Daiwa Trading Scandal (1995): A New York-based trader for Daiwa Securities Group, Toshihide Igushi accumulated $1.1 billion of losses during an 11-year time period. As in Leeson's case, Igushi had control over both the front and back offices, which made it easier to conceal his losses.

Sumitomo (1996): Copper trading losses. London-based copper trader, Yasuo 'Mr. Copper' Hamanaka, entered into a series of unauthorized speculative trades in a bid to boost his section's profits. The trades resulted in the accumulation of approximately $2.6 billion in losses over 13 years.

Enron (2001): In this case, energy trade failures were compounded by fraud and corruption. Enron's calendar year 2000 Form 10K, filed in early April 2001 displayed important warning signs:

- Concerns related to cash flow disclosures: a need for heavy financing as investing cash flow exceeds operating cash flow by a wide margin in 1998 and 1999.
- Enron's management was under pressure to support both the stock price and the debt rating; maintaining the investment grade status was critical to the success of its wholesale business and its ability to maintain adequate liquidity.
- Use of the mark-to-market method for certain types of contracts (other than what is permitted by U.S. GAAP for inventory of commodities) was unusual.
- Engaged in securitization of assets in its so-called price-risk-management business: report assets sales to special purpose entities with inflated values, reported a gain on sale of a portion of a joint venture when the technology for the venture did not exist.
- Extended its mark-to-market accounting to equity-method investments (the equity method enables companies to keep assets and liabilities off the balance sheet). Under the equity method of accounting, Enron should have reported its percentage share of GAAP income on its income statement, and not used the market-value method.
- The allowance for doubtful accounts grew significantly in the last two years, which calls into question the quality of the receivables and underlying revenues.
- Barter transactions were recorded.
- Related party transactions: Enron entered into transactions including receivables, derivatives, and sales of assets with a limited partnership (the Related Party) whose general partner and managing director was a senior officer of Enron.

This type of self-dealing, amounting to billions of dollars, is what ultimately led to the collapse of Enron when potential write-downs related to these activities were announced in October 2001. There were also ample red flags outside of the SEC filings:

- In May 2001, Enron's vice chairman resigned.
- In August 2001, the president resigned.
- The proxy statement shows that top management pay was largely from bonus and stock awards (e.g. the chairman of the board received more than 90% of his compensation from bonus and stock awards).

For further information on Enron, see Douglass, Yu, and Ziemba (2004), which discusses the pension losses of employees. They compare mean-variance with stochastic programming fat tail models and include the ef-

fect of job loss in addition to pension value loss.

Allied Irish Bank (2002): Currency trader John Rusnak, working for a small subsidiary in Maryland, accumulated losses of $691 million between 1997 and late 2001. He hid the losses by entering fake hedging trades and setting up prime brokerage accounts, which gave him the ability to conduct trades through other banks.

6. 2007-9: The subprime crisis

Bear Stearns (2007): From 2005 to the end of 2007, Bear Sterns pursued an aggressive strategy, relying heavily on leverage (35.6 times) to increase its profit, holding large quantities of derivatives, and launching a number of credit-linked 'hedge funds.' At the end of 2007, Bear Sterns held derivatives with a notional value of roughly $13.40 trillion and it had become the seventh largest securities firm in the U.S. by capital and ranked among the most admired firms in the country. By March 2008, Bear Stearns had joined the vastly less prestigious list of failed financial institutions.

The cracks had appeared in the first half of 2007, when rumors circulated that the Bear Stearns High-Grade Structured Credit Fund and the Bear Stearns High-Grade Structured Credit Enhanced Leveraged Fund, faced severe losses. On June 22, 2007, Bear Sterns effectively bailed out the Bear Stearns High-Grade Structured Credit Fund with a $3.2 billion loan, an amount 100 times larger than the firm's initial investment in the fund. Simultaneously, the firm started negotiations with other financial institutions on a series of collateralized loans to the Bear Stearns High-Grade Structured Credit Enhanced Leveraged Fund.

By mid-July 2007, Bear Sterns was forced to admit that the two funds had lost almost all of their value by betting too heavily on highly illiquid CDOs. Shortly after, investors launched a lawsuit against the two funds and the firm. The collapse of the two hedge funds triggered a loss of confidence in Bear Sterns. This made it more difficult for the firm to finance its highly leveraged balance sheet and ultimately led to its failure. Bear Stearns was acquired by JP Morgan Chase on March 16, 2008 in a deal brokered and partly financed by the Federal Reserve Bank of New York.

Merrill Lynch (2007): Based in New York City, Merrill had about 15,000 financial advisors, $13.8 billion in revenue in 2012, and $2.2 trillion in client assets; it is the world's largest brokerage firm. Prior to 2009, it was Merrill Lynch and Co - it was merged into the Bank of America on September 14, 2008. The firm dates back to 1914, when Charles Merrill and Edmond Lynch joined forces. The firm moved into the government securities market, which gave them the leverage to develop money market and government fund products that led to large growth in the 1970s and 1980s (*Time*, 1964) and Merrill's large brokerage network named "the thundering herd" allowed it to sell securities it underwrote directly, giving them an edge on other Wall Street firms.

On one hand, Merrill drove innovation in financial services; *Fortune* magazine called Merrill's Cash Management Account, where credit cards, check writing, and money market mutual funds came together, "the most important innovation in years" (Fortune 1980). On the other hand, its reputation was not sterling; Merrill had a hand in the Orange County disaster. Merrill and other financial institutions were accused of selling risky ill-advised securities to the Orange County treasurer, Robert Citron, thus losing the county $1.69 billion and leading to its bankruptcy. The county sued over ten advisors, accountants, and securities companies, collecting $600 million back - of which $400 million was from Merrill, which settled without admitting liability in June 1998.

All the trouble started in 2003 when they bought the collateralized debt obligations team from Credit Suisse First Boston. They became the top underwriter in 2004. In 2006, they bought First Franklin Financial, a large subprime lender to supply mortgages for the CDOs. They were the lead underwriter on 136 CDOs worth $93 billion in 2006-7. The CDOs were declining in value in late 2007 but Merrill held most of them, which led to the losses. In November 2007, they wrote down $8 billion in losses, removed E. Stanley O'Neal as its head, and replaced him with John Thain. Thain raised $6 billion by selling the commercial finance business to General Electric and shares in Singapore's Temasek holdings. In July 2008, he announced an additional $4.9 billion in losses in Q4. This brought total losses from July 2007 to July 2008 to $19.2 billion. The firm then sold securities and hedge funds to Temasek for $3.4 billion.

In August 2008, Andrew Cuomo, New York Attorney General, threatened to sue Merrill, suggesting that they had misrepresented the risk of mortgage-backed securities. They responded by offering to buy back $12 billion MBS at auction. They then cut costs, froze hiring, and

charged $30 billion in losses to their UK operations, thus avoiding taxes there. By mid 2008, they sold one tranche of CDOs originally worth $30.6 billion for $1.7 billion cash plus a $5.1 billion loan to Lone Star Funds.

In March 2009, Merrill reported that they had received billions from insurance with AIG and $6.8 billion of AIG's government bailout. Even in disgrace, the misbehavior continued; especially troublesome to some observers was the fact that 36.2% of the TARP money received for the bailout, some $3.6 billion, went to executive bonuses. The bonuses were announced on December 8, 2008 after Bank of America had approved the merger, but before Q4s financial results were announced. Criticism of actions like this has led to a somewhat better approach toward executive compensation, including performance related pay, deferred compensation, and roll backs.

Lehman (2008): Lehman Brothers, a famed bond operation and financial services firm, filed for Chapter 11 bankruptcy protection on September 15, 2008. The filing is still the largest bankruptcy in U.S. history, with Lehman holding over $600 billion in assets, including large accounts of various hedge funds and other financial institutions. The systemic risk, with deep interconnections combined with the refusal of the U.S. government to bail Lehman out was a major factor in pushing the stock market lower that fall. The Dow Jones Average fell 4.4% on September 15 and another 7.0% on September 29. Meanwhile the S&P 500 futures fell 9.74% in September, 20.11% in October, 9.22% in November, and 44.2% for the year in 2008.

The Lehman bankruptcy is yet another example of over betting, lack of diversification, and being hit by a bad scenario. Lehman had a huge amount of debt, with leverage of 31-1. In this situation, a 3-4% decline in the value of its assets wiped them out. There were over 100 hedge funds that used Lehman as their prime broker. These positions, with a value of over $400 billion, were frozen. Lehman, like others, got drawn into the subprime mortgage market. They securitized low rated mortgages of poorly financed homebuyers including some "Ninja" loans to those with no money, no job, and no assets. These types of loans may work in a rising real estate market, but as we know, the real estate market peaked in 2005-6 and then fell sharply in most areas of the U.S. By the second quarter of 2008, Lehman reported losses of $2.8 billion and their stock fell 73% in Q1 and Q2 of 2008. They released 1,500 people (6%) just before the Q3 reporting period that year.

There were some options for bailouts. One was the Korean Development Bank whose low offer of $6.40 per share was rejected by Lehman; it was also not clear if the regulators would accept the purchase. On September 9, 2008, Lehman's shares fell 45% to $7.79 when the Korea Bank dropped out. This led to a fall of 3.4% in the S&P 500. On September 10, Lehman announced a $3.9 billion loss. The New York Fed, led by Timothy Geithner, considered a bailout with the involvement of Barclays and Bank of America. However, the Bank of England and the FSA in London were against this. The Bank of America dropped out when U.S. Treasury Secretary Paulson refused to insure part of the losses.

After the bankruptcy, JP Morgan, backed by the Fed, put up $87 billion on September 15 and $51 billion on September 16. On September 22 there was a revised proposal to sell the brokerage division, including Lehman's midtown Manhattan office building valued at $960 million, for $1.29 billion. With Barclays back in the game and no alternative, the deal went through. Barclays received $43 billion in securities and $45.5 billion in liabilities. On November 22, 2008, Nomura purchased Lehman's Asian holdings.

While Lehman collapsed, Lehman Futures survived during the dark days of September 2008. This is a good illustration that futures exchanges, unlike banks and shadow banks, have remained financially stable.

AIG (2008): The U.S. government made an $85 billion bailout when the American International Group, a multinational insurance company with 63,000 employees in more that 130 countries, failed. The company started in 1919 when American Cornelius Van der Starr established a general insurance agency in Shanghai, China. The business expanded, and in 1939, moved the headquarters to New York City. In 1960, Starr hired Maurice R "Hank" Greenberg to develop an international accident and wealth business. Greenberg organized selling insurance through independent brokers rather than agents to avoid their salaries. The 1980s led to new special products such as pollution, liability, and political risk. In the 1990s, they added diversifying investments.

In the 2000s, there were a number of legal troubles and finally, amid an accounting scandal, Hank Greenberg

was ousted and replaced by Martin Sullivan. After Greenberg left, AIG obtained tens of billions of risky mortgages and bought mortgage-backed securities. When losses occurred in 2007, they had to pay insurance claims and collateral account losses. On June 15, 2008 Sullivan resigned amid the losses and stock price decline. In late 2008, AIG suffered still more due to the financial crisis and their own over betting on toxic levered assets including subprime loans. The credit default swaps lost a lot of money.

AIG's credit rating was downgraded, so the firm had to put up more margin money. By September 16, 2008 AIG was essentially bankrupt. The U.S. Fed bailed them out with $85 billion, with 70% of the company's stock going to the government. This was the largest bailout of a company in U.S. history. And yet the troubles continued. Huge executive bonuses in 2009 of $165 million to executives and total bonuses of $1.2 billion led to bad PR and the losses continued. There were more government loans and stock offerings totaling $182.3 billion, but eventually AIG paid back $205 billion so the government made a profit (Sjostrom, 2009; Greenberg and Cunningham, 2013).

Citigroup Inc. (2008): Citi dates from 1812 and, in 2012, was the third largest bank in the U.S., with the shareholders including funds from Singapore and the Middle East. Citi sustained enormous losses in 2008 from subprime mortgages and CDOs combined with poor risk management. The firm was bailed out in November 2008 by the U.S. government TARP, which took a 36% equity stake paid with $25 billion of the bailout money along with a $45 billion line of credit (Citigroup, 2008). The government guaranteed losses on more than $300 billion of underwater assets and gave Citi $20 billion, but there were conditions. For example, the CEO had his salary reduced to $1/year and other executives were capped at $500,000 cash plus restricted stock only exercisable when the bailout was paid back. By December 2010, Citi had repaid the bailout loans and the government made a profit of $12 billion from the sale of shares. Citi recovered from the crisis and became one of the best-capitalized banks in the world, although they failed the Fed's stress test in 2012.

UBS (2008): Subprime losses. At the end of 2007, UBS announced that it would write off $18 billion of failed investments involving the subprime housing market in the United States. In 2008, the write-offs increased to more than $50 billion. In April 2008, at the request of the Swiss Federal Banking Commission, UBS published a report detailing the reasons for its losses (UBS, 2008). In October 2008, the Swiss central bank announced its intention to take $60 billion of toxic assets off UBS's balance sheet and to inject $6 billion of equity capital.

7. Final Remarks

There seems to be no end to a long string of hedge fund and bank trading disasters. The reasons are basically always the same: over betting, lack of diversification, and vulnerability to a bad scenario. The lack of severe penalties for losses and the incentives associated with possible massive fees leads to this behavior.

Here we have discussed hedge fund type behavior in hedge fund and other financial institutions such as bank trading departments. Countries fearing contagion when banks and other large investment vehicles fail, continue to bail them out. Sometimes these bailouts made a profit for the government, even though excessive bonuses to executives should have been avoided. The big hedge funds seem to be able to raise new money after big losses. Hence, more blowups will occur.

There was much debate concerning the true necessity and value of the U.S. 2008 bailouts, irrespective of whether or not they ultimately made a profit. It is hard to estimate the economic value that would have accrued if the institutions that were bailed out had been required to adjust the mortgages as well. The 56% drop in the S&P 500 from the 2007 peak to the March 2009 bottom, indicates that action was needed, however, developing a better understanding of extreme scenarios and more stringent restrictions in the event of future bailouts are strongly advised.

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Hedge Fund Lifecycle

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"Keep it real simple. Do one thing and do it the best you can."
-Harry Snyder, co-founder of In-N-Out Burger

1. Introduction

Last year, our hedge fund research team traveled extensively, researching and meeting with over 500 managers. Our travels took us around the world from the subways of New York and London to the streets of Shanghai and Hong Kong. One of my favorite destinations, however, remains California. Not only does it have a unique culture and hedge fund base, but it is also well-known for its technological innovation and fine cuisine. One required dining stop during each of my research trips is at the famed In-N-Out Burger. Not only are the cheeseburgers legendary, but the company also reminds me of the way a business can use small size to produce high quality results and thrive in a world of much larger competitors.

As a company, In-N-Out Burger exemplifies many of the qualities we look for when recommending hedge funds. The company chooses quality, sustainability, and respect for clients over unbridled growth. In-N-Out exhibits extreme focus and simplicity, which in turn enables great execution. The product does the talking - the brand is quiet and not press-seeking. The company chooses to concentrate its portfolio and instead of having small revenue stakes on a huge franchise portfolio, it owns 100% of a smaller number of carefully chosen stores. Finally, the company maintained its independent family ownership, never giving in to temptations to go public or take on outside investors. As In-N-Out approaches its 65th anniversary this year, its life cycle and evolution as a business is a model worth studying.

The life cycle of a business refers to the various stages of development of a company – from start-up to hiring its first employees to expanding into new markets. Each stage has its own unique characteristics and the focus of its managers will reflect the current point in its life cycle. Hedge funds experience a similar life cycle. Incentives, opportunities, and risks evolve as a hedge fund progresses through its natural evolution as a business. Understanding where a hedge fund manager is in its life cycle has important implications for investors, including when to hire, or terminate a manager, and establishing proper expectations for return, volatility, and correlation.

Alpha, or manager skill, should be the primary driver of returns for hedge funds and, therefore, a wide dispersion of returns separates the best from the rest of the pack. So how does one differentiate ex-ante? Trailing returns? Every investment presentation includes the all-too-familiar disclosure - past performance is not indicative of future results. By incorporating a life cycle analysis into the manager selection process, we believe investors can substantially improve the likelihood of superior performance over a selection process based solely on historical performance. Determining where a manager lies in its life cycle, however, is a combination of an art (qualitative) and a science (quantitative).

While each manager is unique and will have a distinct life cycle, our research indicates that hedge funds generally exhibit similar patterns of progression. We broadly classify the life cycle of a hedge fund into four stages: Emerging, Growth, Maturity, and Decline (leading to Closure or Revitalization). Each underlying stage exhibits similar characteristics including size, age, infrastructure, process, uniqueness, and investor base. As an emerging hedge fund grows assets and generates more consistent returns, the growth and early maturity stages of a hedge fund represent a "sweet spot" for investing. We believe this sweet spot is when a manager is most likely to generate solid, consistent excess returns and has developed a sustainable business and stable operational infrastructure.

Smaller funds are not without risk. They generally operate leaner business teams, which can result in greater operational risk relative to their larger brethren. Additionally, the universe of smaller managers is generally less efficient, which may increase due diligence costs and manager turnover; it will also require a more robust network to source managers and conduct reference checks.

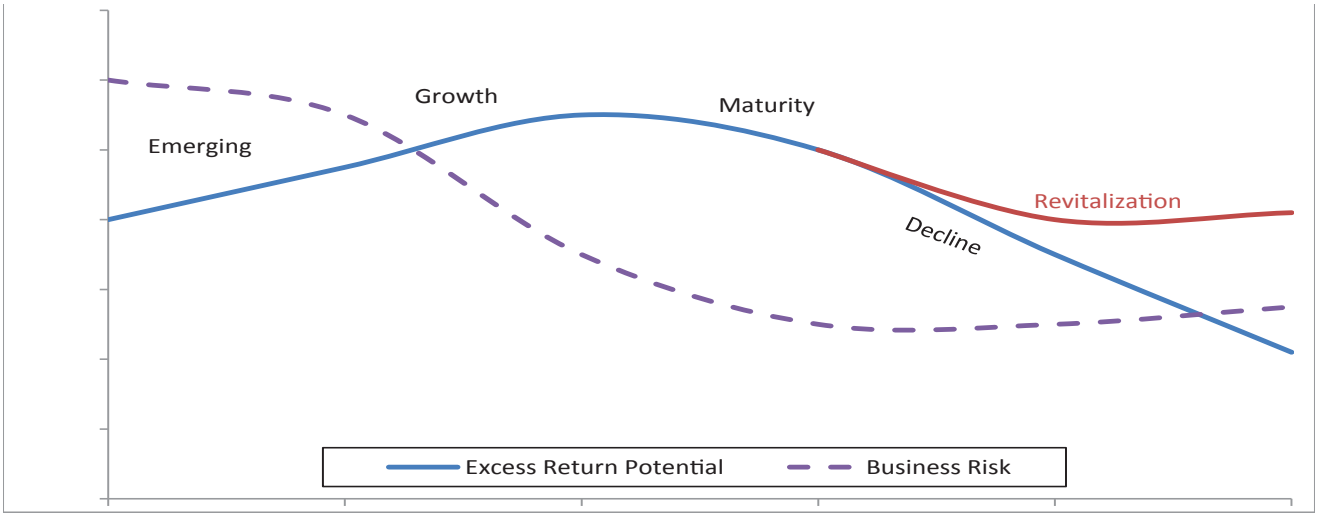
It is worth noting that the length of each stage is not fixed in duration and does not necessarily follow in sequence. For example, some funds move directly from the emerging to the maturity/decline stage and hardly experience a growth stage. It is also important to consider the hedge fund's sub-strategy, as different opportunities have different optimal characteristics. For example, the benefits of size are more pronounced for distressed debt strategies than for a small-cap hedged equity manager. For simplicity, we focus our comments on long/short equity strategies, where the life cycle can be more influential.

2. Bigger is not always better

Academic and industry research has suggested that size is relevant in predicting hedge fund performance and performance persistence. According to a recent study by analytics firm, PerTrac, smaller funds have outperformed much larger funds in 13 out of the last 16 years. Several academic studies have also reached similar conclusions. Getmansky (2005) noted a "positive and concave relationship between fund size and performance, which suggests funds have an optimal size and that exceeding that size has a negative impact on performance." Similar conclusions were reached regarding the persistence of performance. Boyson (2008) noted that "performance persistence is strongest among small, young funds. A portfolio of these funds with prior good performance outperformed a portfolio of large mature funds with poor performance by 9.6 percentage points per year". The study also noted this persistence was strongest among directional (hedged equity) funds. Berk and Green (2004) reached a similar conclusion. Hence, it is not surprising that many high-profile hedge funds have recently returned capital to investors citing their massive size as the enemy of performance.

Despite the research, however, super-sized funds continue to garner a disproportionate share of industry assets and institutional investor attention. As of September 30, 2012, the largest 5% of all hedge funds accounted for over 62% of industry assets. The trend continued in 2012, as the largest funds (>$5 billion) attracted the vast majority of hedge fund capital flows. One could easily hypothesize the reasons for this trend – The entrance of larger pension investors? The perceived safety in larger, less volatile funds? Lower monitoring and due diligence costs? Herding? Career risk?

While size is often the most widely cited characteristics impacting success, our research has identified a number



	Emerging	Growth	Maturity	Decline
Size	Small →			Mega
Age	New →			Mature
Infrastructure	Simple →			Complex
Process	Entrepreneurial →			Bureaucratic
Uniqueness	Distinctive →			Groupthink
Investor Base	Early Adopters →			Laggards

Exhibit 1: Illustrative Hedge Fund Life Cycle
Source: Fund Evaluation Group, LLC

of other qualities which we believe significantly impacts performance. Most notable were the size of the investment team, the number of key decision makers, and the number of funds. As such, we developed a consistent framework ("LIFE") to guide the evaluation process. Broadly classified across six categories, we score 21 variables to systematically evaluate each hedge fund's location in their life cycle. In conjunction with quantitative analysis, we utilize the LIFE score to guide hire and fire decisions and to identify red flags or areas of follow-up.

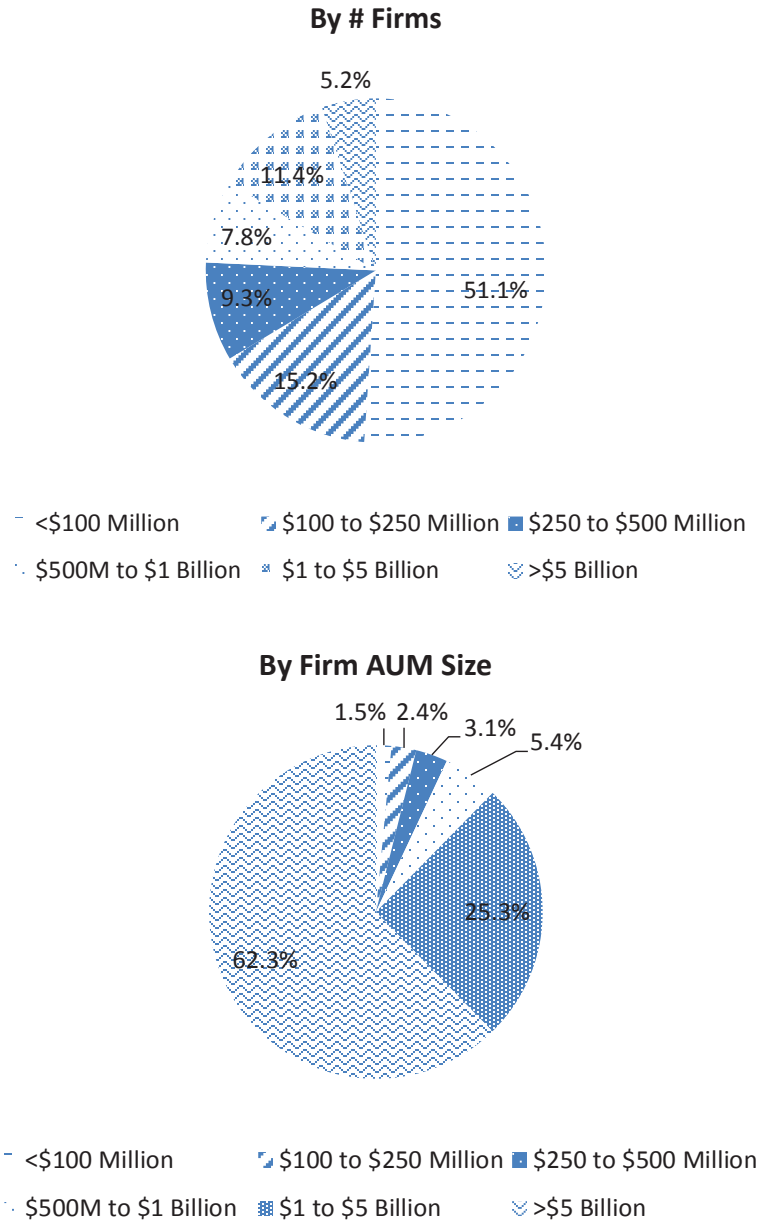


Exhibit 2: Hedge Fund Industry Assets by Firm AUM and AUM Grouping, September 2012
Source: Hedge Fund Research, Bank of America Merrill Lynch

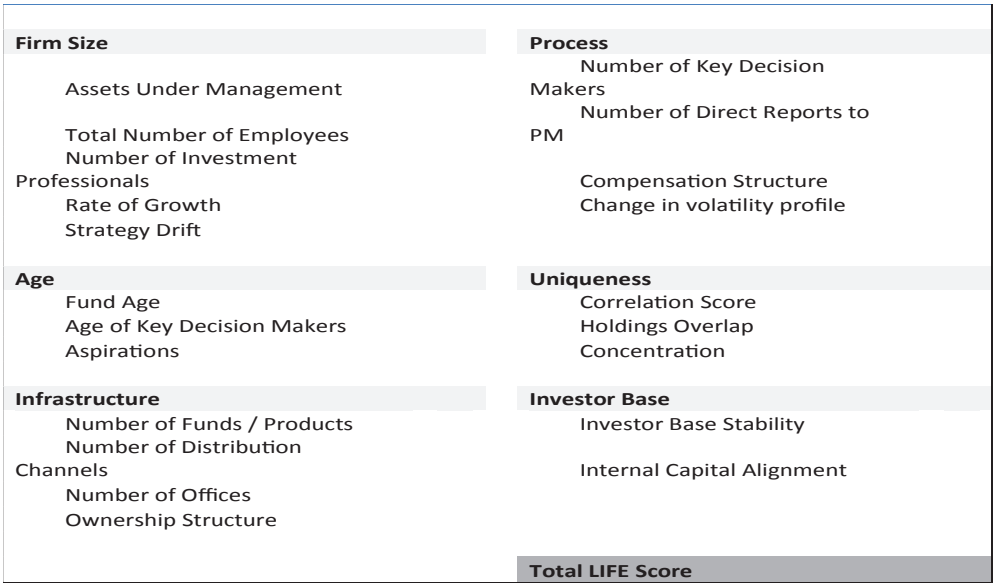


Exhibit 3: Hedge Fund LIFE Analysis - Long/Short Equity
Source: Fund Evaluation Group, LLC

3. Conclusion

Hedge funds naturally evolve through a business life cycle. Incorporating additional analysis on identifying the stage of where a manager lies in their life cycle can improve manager selection. The LIFE analysis provides a systematic methodology to guide the process and provide insights into the expected risk and return profile of a fund. Larger hedge fund managers tend to seek to generate steadier returns with a concurrent focus on controlling volatility, even if it diminishes return potential. The trend towards big funds getting even bigger provides a compelling opportunity for investors to gain access to smaller, capacity-constrained managers. Many of these highly motivated, unique funds are in the sweet spot of their life cycle and offer more upside return potential than their monolithic peers.

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Private Equity and Value Creation in Frontier Markets: The Need for an Operational Approach

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1. Introduction

Nowhere else is the operational value creation approach more in demand than in the Middle East North Africa (MENA) region. Advocating and building operational capabilities requires active investment in business processes, human capital, and a long-term horizon. Developing the capabilities of managers to deliver value from operations will not only result in building capacity for great companies, but will also raise the bar for human talent and organizational capability in the region. In the long term, direct support and nurturing of the new generation of business leaders could have a profound effect on the regional economy, its competitiveness, and overall integration of MENA private equity markets.

A recent study of private equity (PE) in the MENA region reported the results of a survey of the mangers of private equity funds (Balze, Mezias, and Bazian, 2011). The facts portray a stark reality. Most managers responded that they are mid-way through their first fund's investment cycle and are managing between four and nine small- and medium-sized enterprises in their portfolios. At this point in the lifecycle of a fund, the possibilities to exit the investments should begin to unfold. However, it is becoming clear that the prospect of exits for these portfolio companies are less than bright; simply put, the managers of these funds face high hurdles to profitable and timely exits. Another finding from the survey is that large amounts of capital raised during the boom years before 2008 have not yet been invested; the managers of funds holding this so-called "dry powder" are between a rock, (i.e. make bad deals), and a hard place, (i.e. return the unused capital to their investors). Despite this dilemna, managers in the region report that their single highest priority for the future is to raise more capital. While it is understandable that those who manage investment funds would claim that the solution to any problem is more capital, we would suggest a different response to the problems faced by these funds. Specifically, we claim private equity funds in frontier markets like MENA need to take a more operational - as opposed to a financial - approach to growth and returns.

The basic proposition behind private equity (PE) investments is straightforward: limited partners (LPs) provide financial capital to the management teams of PE firms, known as general partners (GPs). The GPs buy ownership stakes in firms with the intention of creating value and eventually capturing value by selling the ownership stakes, earning returns for themselves and the LPs who invested with them. While this clarifies that capturing premiums through ownership transactions is a primary goal for GPs, it does not completely address the question of what GPs need to do to make the stakes more valuable before selling the companies in question. There are many ways that the GPs can manage their investments to increase value, ranging from bringing in functional expertise, e.g., sound financial management, to bringing in specific sector operational expertise, e.g., superior logistics capabilities. Indeed, the expertise required to create value in a given enterprise can be as diverse as the portfolio businesses themselves. Thus, as we introduce a distinction between two approaches to managing PE investments, we admit that it is a great simplification. At the same time, we believe that highlighting this distinction has considerable value in illustrating key points about the PE industry in MENA specifically and frontier markets more generally.

In the industrialized economies, private equity investors often create value by bringing financial or sector-specific operational expertise in to generate greater returns at portfolio companies. This works largely because a majority of the target portfolio companies have an established foundation of corporate governance and basic financial reporting. The managers of the PE firm build on this sound foundation to create additional value using specialized financial approaches or by applying functional knowledge and expertise. In contrast, in frontier markets such as MENA, financial and specialized functional expertise alone are often not sufficient; weak corporate governance and poor financial controls require additional efforts to result in value creation. Failure to recognize and address the lack of sound corporate governance and poor financial reporting practices can result in costly outcomes for private equity investors. In the long run, these expensive lessons for the investors can have a profound effect on the regional economy and other frontier economies in the global financial markets.

To develop recommendations for PE in frontier markets generally, and the MENA region in particular, we begin by distinguishing two approaches to managing PE investments. The first involves the financial approach and focuses almost exclusively on the role of the PE firm in bringing financial expertise to its transactions with target firms. In this approach, the GP relies on cheap money and the use of leverage to amplify the

returns that can be obtained with investment capital from LP. Using this larger capital base, the GP searches for deals that offer opportunities to flip stakes quickly in target firms at a good rate of return. Although there are clear cases where this approach has been able to deliver handsome returns for GP and LP, it has become harder in the wake of the financial crisis, which has made debt financing more difficult. In addition, the crisis has greatly circumscribed options for exiting investments, particularly in frontier markets, which means that GP have been forced to retain their ownership stakes in portfolio businesses for longer periods of time (Balze, Mezias, and Bazian, 2011). The net result is that even GP whose approach might arguably be characterized as more financial than operational have been forced to find alternative funding strategies, for example, generating cash from operations to afford improvement programs. The result has been that the relative importance of operational considerations in creating value has increased. Our point is not to laud this development, although we imagine that a case could be made for doing this; rather, we cite these changes to highlight the fact that recent developments in the financial markets as a whole have amplified the value of core operating competencies within the PE sector in MENA and other frontier markets.

This scenario leads directly to the relevance of the second approach, which we call the operational approach; for funds operating under this philosophy, the relationship between the PE firm and the target firm is hands-on, proactive, and focused on operational and strategic issues. The focus of investor involvement with the target firm can range from rectifying minor issues to improving coordination to very complex turnaround management in more difficult cases. In this approach, the GP takes an active role in managing the target firm, engaging in building and transferring knowledge to increase the value of the target firm. In the operational approach, the GP inspects, reviews, and transforms all aspects of the business, as necessary. Consistent with the espoused purpose of PE, the investing firm adopts a longer timeframe in assessing target firms and takes action that are intended to improve value in the long run. Empirical research has shown that PE investment is associated with higher levels of firm growth and more effective investment strategies, particularly with respect to research and development (Davis et al., 2008; Bruining and Wright, 2002; Lerner, Sorensen, and Stromberg, 2008; Cao and Lerner, 2007; Chapman and Klein, 2009; Wilson, Wright, and Scholes, 2011). Despite recent publicity that suggests evidence to the contrary,[1] research has also demonstrated that PE investments increase levels of employment and wages in the long run (Wright et al., 2007; Work Foundation, 2007; Cressy, Munari, and Malipiero, 2007).

Of course, one response might simply be a decision to invest only in developed markets. Given the challenges of investing in frontier markets like MENA, investors might be inclined to not enter them at all. However, there is a strong countervailing force to any desire to avoid the complexities of frontier markets: investors love growth. In recent decades, it has become increasingly clear that the engines of growth in the global economy are the emerging markets, and this trend has only accelerated in the wake of the financial crisis of 2008. Annual consumption in these markets is growing at an unprecedented pace; Atsmon, Child, Dobbs, and Narasimhan (2012: 1) report that it will reach $30 trillion by 2025, calling these markets "… the biggest growth opportunity in the history of capitalism." In this analysis, we focus on those emerging markets with lower market capitalisation and less liquidity, the so-called frontier markets.[2] Our premise is simple: the need for capital to fund private sector growth and generate employment in these economies is acute. Despite the shallow equity markets and constrained liquidity, the low correlation with broader markets and potential for high returns has piqued the interest of investors, particularly PE capital. We focus on PE investment, particularly in the frontier markets of the MENA region, to highlight the need for investors to focus on the creation of value from operations when they buy stakes in local firms. Indeed, we would claim that the creation of value from operations is the key imperative for successful investment in companies in frontier markets, particularly those of the MENA region.

For PE investments in frontier markets, the post recession credit crunch, which has made the financial approach less tenable, has been exacerbated by a series of challenges that make finding deals with good financials and flipping them quickly more difficult. Prime acquisition targets in frontier markets are typically family owned firms; often they have not developed robust corporate governance or a good foundation of effective business practices. One consequence of weak and ineffective corporate governance is that financial and other management reports are less reliable and difficult

to obtain. In MENA, as in other frontier markets, the governance issues are compounded by the lack of developed legal institutions for financial transactions, which undermines the enforceability of contracts. In addition, the equity markets for initial public offerings are shallow, which greatly limits the options for exit (Leeds and Sunderland, 2003). The MENA region shares these characteristics of frontier markets and adds two additional challenges for the financial approach: First, the integration of economies in this region with global financial markets, especially in terms of share of foreign direct investment, has remained low, given both the sizes of the populations and the levels of GDP (Khoury and Wagner, 2009). Second, there were huge increases in flows of private equity capital to the region in the years before the financial crisis, causing an overheated market and a spectacular collapse. Potential investors in the region now feel "once bitten"; the "twice shy" response is for investors to lose interest in the region, exacerbating the difficulties of exit. Further, owners of firms in the region, having become accustomed to the inflated prices of the boom, are reluctant to accept the lower valuations that are the inevitable consequence of the collapse. The difficulty of finding suitable investments for all of the funds that flowed to MENA PE firms during the boom that had not yet been invested before the collapse, further reinforces the reluctance of LPs to consider investments in the region (Balze, Mezias, and Bazian, 2011; Mezias and Goutam, forthcoming).

To address these current market dynamics, we suggest that MENA GPs should develop in-house operational capabilities and strategic expertise that can be transferred and applied across a number of portfolio businesses. Thus, PE firms in the region can enhance their effectiveness by creating human capital, knowledge systems, and other competencies that permit them to manage their portfolio businesses more effectively. At a minimum, this will involve the capability to implement sound corporate governance and reliable financial reporting systems soon after purchasing a stake in a target firm. Having done this, the possibilities for making portfolio businesses more valuable are greatly enhanced, which can be transformative in its own right. Just as the failure of individual PE investments had negative consequences for the region, we believe that delivering higher returns on PE investments can help to create a flourishing and sustainable MENA private equity industry, with consequent economic benefits for the region. The need for an operational approach is premised on an understanding of several specific and on-going business challenges facing PE in the MENA region.

The first challenge is the need for executive talent in portfolio businesses to execute and deliver ambitious value creation plans. Labor market factors in the MENA region greatly constrain the supply of talented managers, making it prohibitively expensive to hire or poach top talent from other firms. The pool of experienced operations managers is also limited due to the youth of the regional PE industry, which is made worse by the paucity of talented managers emerging from local organizations. Looking beyond the PE arena, free mobility among experienced senior management is not as common as it is in many developed economies. Executives in the major local family conglomerates tend to have deep ties to the firms where they work and their network of businesses; moving to a management position in another firm is often not an option. There is also a problem of supply of educated workers to become junior managers. At the most basic level, there is a fundamental disconnect between how the educational system prepares students and the needs of the economy for skilled managers. In addition, a bloated public sector siphons good people away from the private sector. In the oil-rich Gulf countries, this is exacerbated by issues of cost, productivity, work ethic, and the way that legal systems allocate worker and employer rights (The Economist Intelligence Unit, 2009).

The second challenge is related to the first; specifically, the human capital deficit that leads to a shortage of skilled individuals in MENA economies has corollaries at the levels of organizations. Just as there is a shortage of competent managers, there is also a shortage of organizations with capabilities and competencies vital to growth and successful investment. This problem leads directly to a shortage of viable target firms to create the deal flow that is vital to a vibrant PE sector. Additionally, the lack of competencies and capabilities at organizations constrains the entire ecosystem for PE investments. We use the term ecosystem in a manner very similar to how it is used in biology; we define a PE ecosystem in terms of groups of organizations that provide services to support successful PE investment (Mezias and Goutam, forthcoming), including fund services, special advisers (such as information technology, logistics, and management consulting firms), banking services, and legal services. The number of organizations available to provide services essential to the success of

PE investments is small and in some cases, such organizations are virtually non-existent. This makes it difficult for PE investment to play a role in advancing MENA economic development in a way that is similar to the role that it has played in most industrialized economies.

The lack of organizations in each of these areas creates challenges for PE transactions. A scarcity of fund-services organizations leads to a situation where the most basic aspects of administering a fund must occur at higher cost, from day to day operations to handling the minutiae of doing a deal. The paucity of special advisers in information technology means that integrating systems during an acquisition and using information systems to enhance the value of a target firm will be more difficult. A lack of logistics advisories makes it more difficult to gain advantages from supply chains as well as making supply chain management for an industry or sector more costly. Similarly, difficulty in finding talented local management consultants means that changes in organizational policy and strategy to create value will be more complex and costly. Any deficits in banking services, particularly those most relevant to PE investments, will also create great difficulties. Most notably, this can lead to limited availability of inexpensive debt financing structures, which can intensify the effect of the global credit and liquidity squeezes in the local market. This may make it prohibitively expensive to leverage a portfolio company's assets to finance other activities, such as growth in operations or restructuring programs. Problems arise when a limited amount of debt capital tries to serve both the well-capitalized corporates and the undercapitalized PE portfolio businesses; these issues will be even more acute when knowledge about PE in the local banking sector is underdeveloped. A lack of local law firms familiar with global standards and best practices for PE investments means that managing the legal aspects of PE investments in the local market will be more difficult. Clearly, a lack of depth of organizational competencies across a variety of sectors is likely to have a negative impact on PE firms that do not have these abilities in-house.

Third are the difficulties that PE firms may face due to lack of knowledge about corporate governance standards and state of the art financial reporting systems in MENA economies. This is likely to affect both deal flow and the ability to manage target firms once a deal is consummated. In the MENA region, it is often the case that the firms that might be targets of new investments are led by founding entrepreneurs or their immediate families. Most of these firms have remained small- to medium-sized enterprises and have avoided the need to hire large numbers of outside managers who might have prompted the development of a delegated governance framework. As a result, most of these businesses are dominated by a few related individuals and operate more as personal fiefdoms rather than standardized corporations. Further, the dominant individuals have often exercised autocratic controls and are not accustomed to reporting to anyone. Not surprisingly, they do not often see the need or benefit of investing in financial reporting infrastructure or expertise. This lack of understanding of governance is so widespread that it can make relations with management at target firms much more difficult. At a minimum, PE managers are likely to face resistance in getting managers at target firms to deliver accurate and timely reports about financial and operational results.

Fourth, in terms of volume of transactions relative to GDP and integration with global financial markets, most equity markets in the MENA region are not very well developed (Mezias and Goutam, forthcoming). The controversy when index compiler MSCI Inc. refused to 'promote' the equity markets in Qatar and the UAE from frontier to emerging status[3] is a recent indicator of the general view of MENA equity markets. As a result, there is a shortage of equity or bridge funding available from shareholders. Since LPs are very conservative, often because they are managing pension fund assets, they generally regard any PE investment allocation as very risky. Asking them to select a fund that invests in MENA is an uphill struggle. The infancy of PE industry in the region, the limited track record of successful exits, the uncertain political climate, and the consequent challenges to economic growth conspire to push institutional investors away from funds that operate in the frontier markets.

Finally, the large amounts of capital under management with relatively short time horizons left in the contracted times to liquidation of these funds are another nail in the coffin of the flow of additional PE capital to the region. The majority of the MENA PE funds are in their final five years of the fund cycle. Under normal conditions, they should be preparing for portfolio business exits within the next two to three years. However, the lack lustre capital markets limit the options, and fund managers struggle to identify strategic exits. This

means that buyers who will evaluate the quality of its human capital and the operational processes of target firms carefully have become the only viable option.

Considering all of the above, we do not believe that raising new funds should be the principal objective of GPs in the MENA region over the next five years. Instead, we would suggest that the top priority for GPs in the MENA region should be to build operational capacity. This will require a continuous focus on growth and profitability of portfolio businesses. As the prior discussion suggests, this will not be easy. Where can GPs find experienced managers with the requisite operational, technological, and logistical expertise to grow or turn these businesses around? At a minimum, GPs must engage intensively with the portfolio company management teams, and this will take considerable time, energy, and attention. It is not easy to act and behave like a full-time dedicated owner of all the portfolio businesses while simultaneously being responsible for sourcing new deals, managing comprehensive due diligence processes, and keeping the LPs fully informed of all aspects of the fund's monthly and quarterly performance.

2. Not a formula but a philosophy

Every PE firm that has implemented an active operations management model will have its own approach and specific philosophy. We believe that there is no strict recipe for building an in-house operations capability, but there is a set of principles that revolves around constantly reviewing the strategy and proactively managing the operations of portfolio businesses. The first recommendation is for GPs to stay as close to the business as possible. This is more easily said than done, since investment bankers tend to dominate the founding teams of many PE firms. These founders are highly motivated and talented in sourcing deals, buying undervalued companies, and fund raising, but are rarely best suited to working proactively with the portfolio management teams on operational tasks. Once they have closed the deal, however, things change; it is in this post-acquisition phase that the need for senior operational experience becomes apparent. Thus, implementing this recommendation begins with the appointment of an in-house operations manager with the requisite experience, skills, and knowledge to serve as either a non-executive board member or a special advisor to the portfolio business. To take this recommendation further, we would suggest that no GP should close a deal to buy equity in a firm without having identified the person who will be the operations manager after the deal closes. The parent PE firm should expect that the operations manager would spend in excess of 70% of his/her time at the new portfolio business in the first few weeks following an acquisition. This exhaustive interaction helps build credibility and trust as well as set transparent delivery expectations. More importantly, it is an excellent opportunity to assess the capability of the current management team; based on this information the operations manager must decide quickly whether to rely on the existing management team, to complement them with external consultants and support services, or even to replace them.

The second recommendation is to have clear, executable performance improvement plans that will create value in both the short and long term for each of the portfolio businesses. Initially developed by the GP, the operations manager must ensure that the management team at the portfolio company will validate and own the plan after the acquisition. Though many management teams, even in frontier markets, have some experience with improvement programs, not many have had experience managing profit and loss, preserving cash, and reducing costs simultaneously in the context of a hard-nosed value creation plan. The first few quarters, indeed through the first two years, can be highly stressful period for portfolio management teams. Over and over, the operations manager must revisit the same question with the CEO/CFO of a portfolio business: What do they need in order to deliver on specific difficult targets for the coming quarter or year? The answer to this question will almost invariably be followed by the tougher question of why the results cannot be delivered even sooner. Although part of the purpose is to push the team to achieve better results, there should also be a clear information flow back to the GP to ensure that the portfolio firm receives the resources required to achieve the ambitious goals of the performance improvement plan. This is particularly important when the portfolio company has been burdened with significant debt and restrictive collaterals, which is often the case in a PE buyout or purchase of a stake. With full awareness of these challenges, an experienced operations manager must begin work to implement detailed plans for value creation immediately following the close of a deal. Intensive engagement with management of the portfolio business ensures that the CEO, CFO, and other top managers of the business will validate and support the plans and revise them as necessary.

The third recommendation is to implement transparent governance, financial, and cash reporting systems across all new portfolio businesses in order to enable continuous monitoring, evaluation, and benchmarking activities. Real-time decision-making and continuous financial reporting to achieve turnaround targets must become one of the core competitive competencies of the portfolio business. Introducing and implementing these systems along with training the business finance team at the portfolio company to produce accurate, timely financial and cash management reports becomes a priority.

Success will likely require a significant upfront investment of time from the operations manager. In the best case scenario, where the portfolio firm already has a competent CFO supported by a skilled finance team, the efforts of the operations manager will likely be focused on mentoring. For example, producing a weekly sales flash report, a rolling 13-week cash flow forecast, and timely and accurate projections for the month, quarter, and year can be huge burdens on the finance team of a small portfolio company. Most CFOs are highly competent and can often produce such information with considerable speed and accuracy, but not necessarily on a weekly basis. More importantly, CFOs are accustomed to managing businesses through longer term profit and loss measures rather than through short-term cash and working capital.

Indeed, managing the business by preserving and proactively managing cash and working capital requires a paradigm change for these personnel. Where competent finance personnel are not already in place, the operations manager must devote time to assembling a team and then start the process of orienting them and the firm to the difficult cash and working capital issues. Obviously, the time required from the operations manager to get these systems in place at the portfolio company will be greater when significant recruitment of finance personnel is added to the mix. Staying close to the business, particularly immediately after closing a deal, will almost invariably be a full-time job; the shift to continuous monitoring of operational finance targets that are linked directly the performance improvement plan will not be achieved by remote control.

The fourth recommendation is to offer access to expert networks and shared service centers to portfolio companies as needed, including sourcing, legal services, and property management, for example. Most PE portfolio businesses in the MENA region are small- to medium-sized enterprises with limited in-house pools of specialist knowledge. To illustrate this point, consider a local clothing retailer that operates a number of outlet stores; the core capability of this business is to market and sell clothes in its domestic market. An operations manager working across a number of portfolio businesses can immediately see the benefits of setting up a shared garment sourcing unit in China with the objective of supplying the portfolio businesses with the best quality products at the lowest price.

We can generalize this point by returning to our earlier discussion of the ecosystem to support PE investments. Offering shared in-house dedicated service centers, whether for logistics, information technology, management consulting, banking, or legal issues, can compensate for gaps in the development of these capabilities in frontier markets like MENA. Whether the PE firm sources or supplies these services, pooling demand across the portfolio businesses creates volume that can yield significantly lower costs, which is a win-win for both the PE firm and the portfolio companies.

The final, and perhaps most important, recommendation is to set up and agree on a well aligned and transparent reward structure with clear value creation targets for the CEO and senior managers of the newly acquired portfolio businesses. The operations manager must negotiate and finalize the reward structure, including the management option plan, either before or soon after the deal closes. As a guideline, most management option pools are between 5% and 10% of the total equity. Setting up such a reward scheme requires the full coordination of all stakeholders, including external advisors. Complex activities such as estimating potential exit values, obtaining approvals from the remuneration committees of funds, and understanding the tax and legal implications in the geography of the operating business require a range of expertise. The challenge is even greater when this knowledge must be deployed quickly and with requisite due diligence.

3. Conclusion

This list of recommendations is not exhaustive nor complete for building the capability for operations management; rather it offers important, pertinent discussion points for PE businesses in MENA and other frontier markets. Becoming an active shareholder and adopting

an operational approach is not a new phenomenon in the PE industry. Over the years, many of the top global PE firms have developed and continuously refined their in-house operations capabilities to suit specific geographies and business sectors. Some of the best known PE firms began operations with an explicit focus on operational capabilities; for example, at The Carlyle Group, two of three co-founders, William Conway and Daniel D'Aniello, came from an operating background. Other leading PE firms have established dedicated units to service their portfolio companies; for example, at KKR, all portfolio businesses have access to KKR Capstone, a team of more than 60 operating executives.

In the MENA region and other emerging markets, it is often the case that operational value creation is even more challenging than in the industrialized economies. Indeed, local GPs in the MENA region, such as Mubadala and Abraaj, have adopted the operational philosophy. Over the last decade, Mubadala has developed and refined its operational philosophy by centralizing certain functions such as finance, new business development, property, and legal services. Simultaneously, they have decentralized sales, human resources, and logistics at the portfolio company level. They have also actively managed the rotation and secondment of senior executives to new portfolio companies in order to ensure that operational expertise is transferred across portfolio business. These actions by GPs such as Mubadala and Abraaj are consistent with the operational approach that we have advocated.

Building operational capability in MENA and other emerging markets requires active investment and a long time horizon. More to our point, given that a finance approach will generally not be successful, any PE investor in the region should assess potential deals with an eye towards creating value through operations. GPs must focus on the long term by building their operational capabilities and investing actively in developing operational managers. This will not only improve their chances of delivering higher returns to their LPs; it will also fulfill the promise of PE activity as a central part of broader economic development. By building great companies, PE investments will help to build a new generation of business leaders for the region. We have little doubt that such an injection of human talent and organizational capability would be like a shot of economic adrenalin to help propel and grow the MENA economies. This long-term investment in people and firms could have a profound effect on the regional economy, its competitiveness, and the overall integration of MENA (private and public) equity markets with global financial markets.

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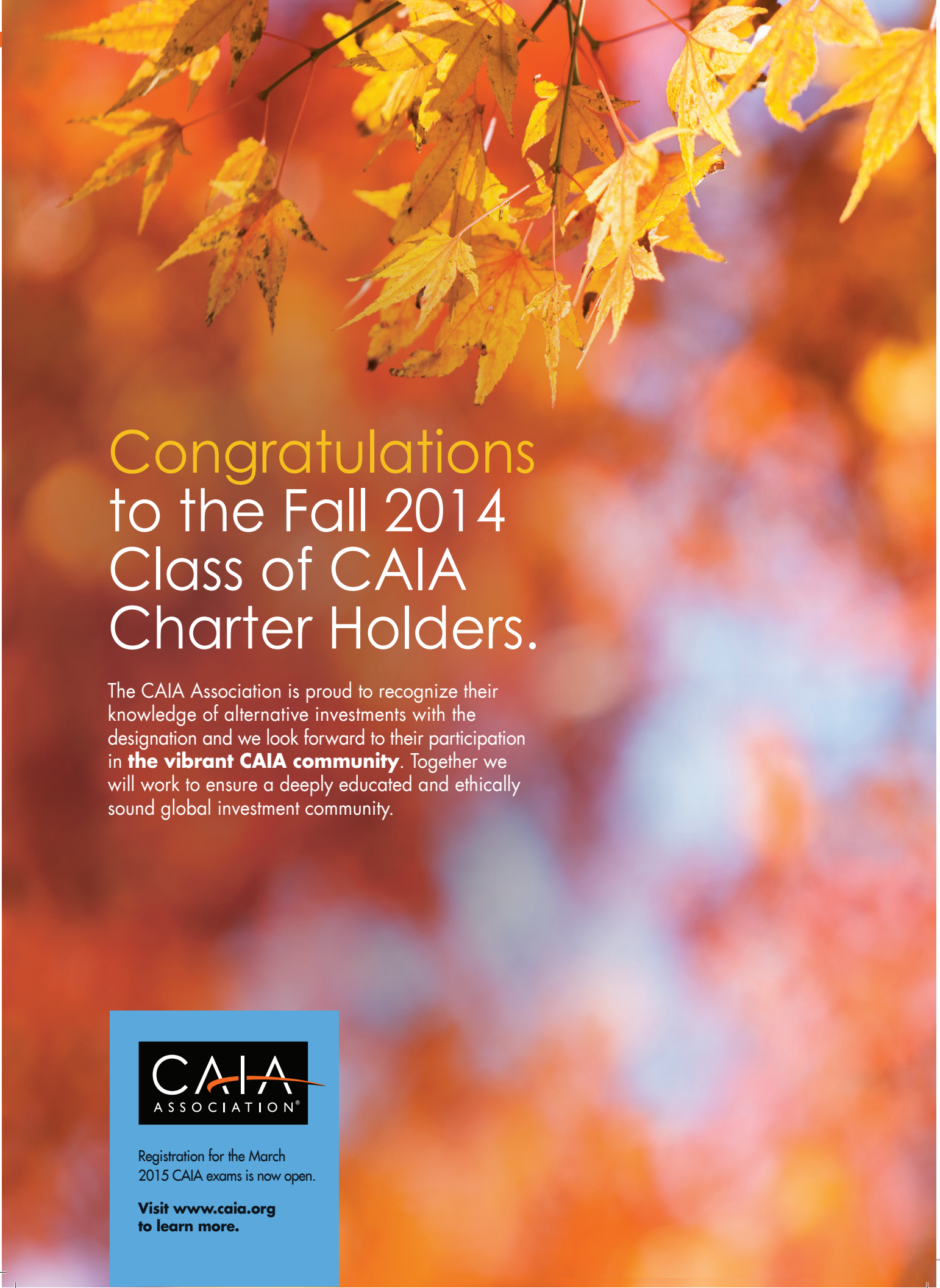

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What Is Money? From Commodities to Virtual Currencies/ Bitcoin

Benton E. Gup
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1. Introduction

Money is a term of art that may be described by its functions. The three primary functions are 1) a means of exchange in terms of 2) a defined unit of account that is used as 3) a measure and store of value. What constitutes money and the methods of payments has evolved over time. This article focuses on money and payments in the United States. Laws and regulations that are applicable in the U.S. may not apply in other countries, and vice versa.

2. Commodity Money

Some forms of money were being used as early as 2200 BC, but the forms of money have changed considerably since then.[1] The early money was usually a commodity that had intrinsic value, such as gold, silver, cattle, and seeds. Around the 18th century, "commodity-backed" money appeared. These were pieces of paper (e.g. gold certificates) that could be exchanged for a fixed amount of the underlying commodity (e.g. gold). The advantages of commodity-backed money were its portability and the fact that large amounts of value could be transferred by a single piece of paper.

3. Fiat Money

Over time, commodity-backed money was replaced by fiat money. Fiat money is any legal tender designated and issued by a central government authority. In the United States, fiat money is legal tender that consists of United States coins and currency (including Federal Reserve notes and circulating notes of Federal Reserve Banks and national banks) that can be used to pay for all debts, public charges, taxes, and dues. Foreign gold and silver coins are not legal tender for debts.[2] Fiat money does not mean that the dollars or fractions of dollars must equal something having intrinsic or substantive value.[3]

In 1863, President Abraham Lincoln enacted the National Banking Act to establish a national banking system and a uniform national currency. The Act also provided for the sale of government bonds to help finance the Civil War and it allowed national banks to issue notes (i.e. currency). The National Banking Act was originally known as the National Currency Act. The "National Currency Era," allowing national banks to issue currency, came to an end in1935 as currency was consolidated into Federal Reserve Notes, United States Notes, and Silver Certificates.[4]

The first fiat money issued in the United States was produced in 1690. The Massachusetts Bay Colony, one of the original 13 colonies, issued paper money to cover the costs of their military expeditions.[5] The issuance of paper notes spread to the other colonies, and in 1739, Benjamin Franklin's printing company in Philadelphia printed notes with complex patterns cast from actual leaves that were difficult to counterfeit.

In 1775, the Continental Congress issued paper currency - "Continental Currency" - to finance the Revolutionary War. However, the Continental Currency was denominated in Spanish milled dollars, had no backing from the government, and was easily counterfeited. As a result of these shortcomings, the currency declined in value.

The Coinage Act of 1792 created the U.S. Mint, and established a federal monetary system with coins backed by gold, silver, and copper. In 1861, Congress authorized the Treasury to issue non-interest-bearing Demand Notes that were called "greenbacks" because of their color. All U.S. currency printed since then remains valid and is redeemable at full face value.

Subsequently, the methods of payments gradually evolved from coins and currency to electronic checks, credit cards, stored value cards, smart cards, and various forms of electronic payments via the Internet, land line phones, and mobile phones. Some of these methods have biometric security devices (e.g. finger prints, iris scan, voice recognition) for security purposes.[6]

According to the Board of Governors of the Federal Reserve system in the United States, there is "no Federal statute mandating that a private business, a person, or an organization must accept U.S. currency or coins as payment for goods or services. Private businesses are free to develop their own policies on whether to accept cash unless there is a state law which says otherwise."[7] For example, a gas station may refuse to take bills larger than $20 to buy gasoline.

4. Virtual Currencies

In recent years, there has been growth of virtual currencies. The Financial Crimes Enforcement Network (Fin CEN) distinguishes "real" currency from "virtual currency."

A "real" currency is "coin and paper money of the Unit-

ed States or any other country that is designated as legal tender, circulates, and is customarily used and accepted as a medium of exchange in the country of issuance.[8]

In contrast to a real currency, virtual currency is a medium of exchange that operates like a currency in some environments, but does not have all of the attributes of real currency. In particular, virtual currency does not have legal tender status in any jurisdiction.[9] Therefore, under the Bank Secrecy Act, virtual currency does not meet the criteria to be considered currency because it is not legal tender.[10] Nevertheless, it acts as a substitute for real currency and can be exchanged for real currency.[11] Virtual currencies are also referred to as fiduciary currencies, which means that they have no intrinsic value (i.e. they are not backed by gold, silver, oil, wheat, or other commodities), and their value is determined by government fiat or the market price.[12]

There are many different virtual currencies. For example, World of Watercraft (WoW) Gold, is used in a game designed by Blizzard Entertainment, and Linden Dollars are used in Second Life, a virtual community in an online game.[13] Facebook Credits (FB) can be used to buy virtual goods on the Facebook platform, and Frequent-Flyer loyalty programs offer vouchers and bonus points that can be exchanged for flights.[14] Bitcoin is a virtual currency that will be discussed in detail shortly. The main focus here is on virtual currency schemes used as a form of electronic money to buy goods and services and for other purposes.[15]

The advantages of virtual currency are:[16]

- The user can remain relatively anonymous.
- It is easy to use.
- The fees may be low.
- It is globally accessible through the Internet.
- It serves as a store of value and can be used to transfer value domestically and internationally.
- There are few transaction limits.
- It is generally secure.
- The transactions are irrevocable.

From the point of view of law enforcement agencies and government authorities, disadvantages of virtual currency include the fact that:

- Some systems may have been created to facilitate money laundering.
- It tends to be decentralized, with no central administrator to maintain records or report suspicious financial activities.
- It can be used to exploit the weaknesses in the anti-money laundering and counter-terrorism regimes in various countries.

Convertible virtual currencies can be centralized or decentralized. The centralized virtual currencies have a repository and a single administrator who exchanges the virtual currency for real currency or funds, or vice versa. Decentralized virtual currencies do not have a centralized repository or single administrator. The value is electronically transmitted between the buyer and the seller of the currency. In all fairness, it must be pointed out that any currency can be used for both legal and illegal purposes. Recent U.S. Senate Hearings focus on the illegal activities of digital currencies.

The Silk Road was an online market place where many illegal products and services were sold using Bitcoins for two-and-a-half years or more.[17] The most popular products were illegal drugs and forged documents such as passports. "Silk Road was used by several thousand drug dealers and other unlawful vendors to distribute hundreds of kilograms of illegal drugs and other illicit goods and services to well over a hundred thousand buyers, and to launder hundreds of millions of dollars from these unlawful transactions."[18] It was also known for gun running and murder for hire. Approximately $1.2 billion in transactions were made through the Silk Road.

Liberty Reserve, a currency-transfer and payment processing company based in Costa Rica, allowed customers to move money anonymously. It is another example of how an anonymous currency processor was used to facilitate part of large-scale illegal business operations enabling criminals to engage in various frauds, drug trafficking, child pornography, and money laundering.[19] Liberty Reserve processed transactions worth approximately $8 billion over the twelve-month period preceding October 2013; however, this measure may be artificially high due to the extensive use of automated layering in Bitcoin transactions.

By way of comparison, in 2012, the Bank of America processed $244.4 trillion in wire transfers, and Western Union made remittances totaling approximately $81 billion. According to the United Nations Office on Drugs and Crime (UNDOC), the amount of all global criminal proceeds available for laundering through the

financial system in 2009 was $1.6 trillion.[20]

5. Bitcoin

Bitcoin is a decentralized or person to person (P2P) virtual currency available in the United States and other countries for use in online transactions. Bitcoins can also be traded on an exchange or through private transactions. Bitcoins are stored in an online wallet by companies like Blockchain, My Wallet, and Coinbase that provide safekeeping services. The Bitcoin balances in online wallets are a matter of public record that can be accessed by a number stored in physical representations of Bitcoins, called tokens. The wallets also have a private key that is used for transferring Bitcoins. The payment transactions are recorded and shared in a public ledger called a "block chain" that is shared by all nodes participating in the system; this assures that the same Bitcoins cannot be spent twice.[21]

Bitcoin is a cryptocurrency, which means that it relies on complex cryptographic software protocols to generate the currency and to validate transactions.[22] Other cryptocurrencies include Litecoin, Peercoin, Namecoin, and Bbqcoin.[23] In addition, there are Amazon Coins, Ripple, OpenCoin, MintChip, and Linden Dollars.[24] Finally, there are anonymous Internet payment schemes, such as Moscow-based WebMoney, Perfect Money based in Panama, and CashU, which serves the Middle East and North Africa.[25]

Some businesses in the United States accept Bitcoins.[26] It is recognized by Germany as private money.[27] In China, individuals can trade in Bitcoins, but they cannot be exchanged for real currency at Chinese banks. In Finland, it is considered a "commodity," and it is accepted by some businesses.[28] In Canada and Norway, Bitcoin is legal, but it is not legal tender.[29] Bitcoin is banned in Thailand,[30] and virtual currencies are illegal in Russia.[31]

Bitcoin was created in 2008 or 2009 by Satoshi Nakamoto, who wrote a paper entitled "Bitcoin: A Peer-to-Peer Electronic Cash System."[32] The system allows payments to be sent directly from one party to another anonymously, without going through a financial institution or keeping records of the transactions. Previously, payers had to rely on third-party services such as MasterCard or PayPal to make the payments and keep records of the transactions.

Bitcoin offers users a low cost global payment standard, and an easy way to transact business across national borders. It also offers privacy. Moreover, it cannot be easily confiscated by a government, which makes it attractive to criminals, including drug dealers.[33] This brought it to the attention of FinCEN (Financial Crimes Enforcement Network), the Department of Justice, and other government agencies.[34] Under FinCENs rules, "anyone who accepts and transmits a convertible virtual currency, or buys or sells convertible currency for any reason is a money transmitter" under the Bank Secrecy Act (BSA).[35] The definition does not differentiate between real and virtual currencies. However, the definition does have some exclusions.[36] Futures commission merchants that are registered with and regulated by the Commodities Futures Trading Commission are excluded, for example.

Some online transactions are denominated in Bitcoins, which derive their value in an open market. The price/value is highly volatile; Bitcoins began trading at less than five cents in 2010 and soared to more than $1,200 in 2013.[37] The stated value was $535 in February 2014.[38] Bitcoins used to be actively traded on the Mt. Gox currency exchange in Tokyo and Japan and on the BTC exchange based in China.[39] Bitcoins can also be traded on Bitstamp, located in Reading, United Kingdom, and in the Republic of Slovenia.[40]

Mt. Gox's multiple currency markets allowed users to purchase and resell their Bitcoins in up to 16 different currencies, along with the ability to securely store Bitcoins in a virtual "vault" for safe keeping.[41] However, the so-called vault was not completely safe and Mt. Gox filed for bankruptcy in Japan after 850,000 customers and the exchanges Bitcoins (worth about $425 million at current prices) disappeared.[42] Mt. Gox also filed for Chapter 15 bankruptcy protection in Dallas, Texas, where it had stored some of its data on computer servers.[43]

Being a peer-to-peer network, Bitcoin depends on its users, who are called miners, to create the currency units and verify transactions. In other words, it is a decentralized system with no central monetary authority. Bitcoins are created or "mined" by computers solving increasingly complex math problems (i.e. algorithms) that verify the sequence of data (i.e. the block) that are linked together and are recorded in a public ledger known as the "block chain." The miners are rewarded with transactions fees. The system was designed so that

the maximum number of Bitcoins that can be mined is 21 million, and the system will cease operation in 2140.[44]

Because Bitcoin payments are peer-to-peer, the transaction costs are lower than if they had to go through a third-party intermediary. This makes Bitcoin attractive to some cost-conscious small businesses and for those who want to send low-cost remittances to relatives living in developing countries. RoboCoin is the first Bitcoin Automatic Teller Machine (ATM).[45] It allows one to buy and sell Bitcoins on a RoboCoin ATM. Gavin Andreson, chief scientist for Bitcoin, stated in an interview with the *Wall Street Journal,* that Bitcoin is "still an experiment, and (you should) only invest time or money you could afford to lose."[46]

6. Conclusion

What constitutes money and the method of payments has evolved continuously since 2200 BC.

Commodities, such as gold and silver, were replaced by commodity-backed paper money. Next came fiat money (i.e. U.S. coins and currency), which was first issued in the United States in 1690. Subsequently, the methods of payments evolved from currency to checks, credit cards, and various forms of electronic payments. The latest innovation is virtual currencies that operate like currency, but do not have all of the attributes of real currency. For example, U.S. currencies are "legal tender" for all public and private debts, but virtual currencies do not have that status. Nevertheless, virtual currencies have attributes that make them attractive for both legal and illegal activities. These include but are not limited to user anonymity, low user costs, accessibility though the Internet, and irrevocable transactions.

Bitcoin is the most successful of more than a dozen other virtual currencies that are used globally for both legal and illegal activities. Thus, Canada, China, Germany, Norway, Thailand, the United States, and other countries have different laws applying to virtual currencies. The evidence suggests that virtual currencies – Bitcoins and others - will play an increasing role in payments systems, not just in the U.S., but worldwide. According to CoinDesk, Bitcoins are being used in North and South America, Europe, Africa, and Asia.[47]

The number of companies accepting Bitcoins in November 2013 soared from 552 to more than 1,000. "use-Bitcoins.info" reported that more than 2,000 businesses use Bitcoins worldwide.[48] However, the value of virtual currencies, such as Bitcoin, is volatile. Caveat Emptor! (Let the buyer beware!)

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Author Bio

Dr. Benton E. Gup is an internationally known lecturer in executive development and graduate programs in Australia (University of Melbourne, University of Technology, Sydney, Monash University, Melbourne), New Zealand (University of Auckland), Peru (University of Lima), and South Africa (Graduate School of Business Leadership). He has been a visiting researcher at the Bank of Japan and at Macquarie University in Australia. He has lectured in South America, Europe, and North Africa for the U.S. Department of State and served as a consultant to the IMF in Uruguay.

Dr. Gup is the author or editor of numerous books including *Banking and Financial Institutions: A Guide for Directors, Investors, and Counterparties* (2011), *The Valuation Handbook: Valuation Techniques from Today's Top Practitioners,* with Rawley Thomas, (2010), *Handbook for Directors of Financial Institutions* (2008), and *Money Laundering, Financing Terrorism,* and *Suspicious Activity* (2007). Dr. Gup's articles have appeared in *The Journal of Finance, The Journal of Financial and Quantitative Analysis, The Journal of Banking and Finance, Financial Analysts Journal,* and elsewhere.
His undergraduate and graduate degrees are from the University of Cincinnati. After receiving his Ph.D. in economics, Dr. Gup served as a staff economist for the Federal Reserve Bank of Cleveland.

IR&M Momentum Monitor

Alexander Ineichen, CAIA
Ineichen Research & Management AG

IR&M Momentum Monitor

By Alexander Ineichen, CFA, CAIA, FRM; www.ineichen-rm.com

IR&M

Price Momentum

Earnings Momentum

	Price Momentum								Earnings Momentum							
	Medium-term				Long-term				Medium-term				Long-term			
Calendar Week:	**42**	**43**	**44**	**45**	**42**	**43**	**44**	**45**	**42**	**43**	**44**	**45**	**42**	**43**	**44**	**45**
Equities by region																
MSCI World	-4	-5	-6	1	114	115	116	-1	-6	-7	-8	-9	89	90	91	92
Europe (STOXX 600)	-3	-4	-5	-6	115	116	117	-1	22	23	-1	-2	15	16	17	18
MSCI Emerging Markets	-5	-6	-7	-8	25	26	27	-1	-6	-7	-8	-9	-3	-4	-5	-6
MSCI Asia Pacific ex Japan	-5	-6	-7	-8	29	30	31	-1	-5	-6	-7	-8	50	51	52	-1
Equities by country																
USA (S&P 500)	-2	-3	1	2	143	144	145	146	98	-1	-2	-3	137	138	139	140
Canada (SPTSX 60)	-4	-5	-6	-7	60	61	62	63	31	32	-1	-2	27	28	29	30
Brazil (Bovespa)	-3	-4	-5	-6	22	23	24	25	-7	-8	-9	-10	-6	-7	-8	-9
France (CAC 40)	-3	-4	-5	-6	-9	-10	-11	-12	10	11	-1	-2	5	6	7	8
Germany (DAX 30)	-3	-4	-5	-6	-8	-9	-10	-11	44	45	46	-1	78	79	80	81
Italy (FTSE MIB)	-3	-4	-5	-6	-7	-8	-9	-10	8	9	-1	-2	16	17	18	19
Switzerland (SMI)	-2	-3	1	2	118	119	120	121	23	24	25	26	9	10	11	12
UK (FTSE100)	-4	-5	-6	-7	-3	-4	-5	-6	12	-1	-2	-3	2	3	4	5
Australia (S&P/ASX)	-5	-6	1	2	112	113	-1	-2	7	-1	-2	-3	4	5	6	7
China (Shanghai Composite)	16	17	18	19	11	12	13	14	17	-1	-2	-3	84	85	86	87
Hong Kong (Hang Seng)	-4	-5	-6	-7	16	17	18	19	22	23	24	-1	12	13	14	15
India (Nifty)	33	-1	1	2	51	52	53	54	55	56	57	58	46	47	48	49
Japan (Nikkei 225)	-2	-3	1	2	14	15	16	17	49	50	51	52	86	87	88	89
South Korea (Kospi)	-5	-6	-7	-8	14	-1	-2	-3	-40	-41	-42	-43	-71	-72	-73	-74
Bonds																
Barclays Global Aggregate	-7	-8	-9	-10	-1	-2	-3	-4								
Barclays Global HY	-7	-8	-9	-10	59	-1	-2	-3								
Barclays Euro Aggregate	56	57	58	59	51	52	53	54								
Barclays Asia Pacific Aggregate	58	59	60	61	54	55	56	57								
Barclays Global Emerging Markets	-6	-7	1	-1	45	46	47	48								
Barclays US Aggregate	3	4	5	6	40	41	42	43								
Barclays US Corporate HY	-5	-6	1	2	147	148	149	150								
Hedge Funds																
HFRX Global Hedge Funds	-3	-4	-5	-6	112	113	-1	-2								
HFRX Macro/CTA	9	10	11	12	14	15	16	17								
HFRX Equity Hedge	-2	-3	-4	1	112	113	114	115								
HFRX Event Driven	-5	-6	-7	-8	-1	-2	-3	-4								
HFRX Relative Value Arbitrage	-14	-15	-16	-17	-6	-7	-8	-9								
HFRX Fixed Income - Credit	-5	-6	-7	-8	-1	-2	-3	-4								
Commodities																
Thomson Reuters/Jefferies CRB	-15	-16	-17	-18	-7	-8	-9	-10								
Gold (Comex)	-9	-10	-11	-12	-5	-6	-7	-8								
Copper (Comex)	-8	-9	-10	-11	-5	-6	-7	-8								
Oil (WTI)	-15	-16	-17	-18	-8	-9	-10	-11								
FX																
USD (trade-weighted, DXY)	22	23	24	25	14	15	16	17								
EURUSD	-23	-24	-25	-26	-16	-17	-18	-19								
JPYUSD	-12	-13	-14	-15	-7	-8	-9	-10								
Central banks' balance sheets																
Fed balance sheet	105	106	107	108	97	98	99	100								
ECB balance sheet	-1	-2	1	2	-96	-97	-98	-99								
BoJ balance sheet	127	128	129	130	147	148	149	150								
BoE balance sheet	4	5	6	7	29	30	31	32								

Commentary

Long-term price momentum for some multi-regional equities indices turned negative in the first week of November.

Long-term momentum in some broad bond indices turned negative during October.

Long-term momentum of earnings estimates remains positive for the MSCI World but is off peak levels from a couple of months ago.

The USD has positive momentum.

The Fed's balance sheet continues to expand.

Tutorial

The momentum numbers count the weeks of a trend based on moving averages. Green (or black text) marks a positive trend, red (or white text) marks a negative one. Example: In week 22, the S&P has been in a long-term bullish trend for 123 weeks. See www.ineichen-rm.com for more information and/or a trial issue.

Purpose

The Momentum Monitor was designed to help investors with risk management, asset allocation, and position sizing. Tail events do not always happen out of the blue. They often occur when momentum is negative. Negative momentum makes hedging more important and suggests position sizing should be more conservative. In a bull market, one ought to be long or flat, but not short. In a bear market, one ought to be short or flat, but not long.

Source: IR&M, Bloomberg. Notes: Medium-term based on exponentially weighted average over 3 and 10 weeks. Long-term based on simply weighted average over 10 and 40 weeks. Earnings momentum is based on 12-month forward consesus EPS estimates.

Alexander Ineichen is founder of Ineichen Research and Management AG, a research firm founded in October 2009 focusing on risk management, absolute returns, and thematic investing.

Alexander started his financial career in derivatives brokerage and origination of risk management products at Swiss Bank Corporation in 1988. From 1991 to 2005 he had various research functions within UBS Investment Bank in Zurich and London relating to equity derivatives, indices, capital flows, and alternative investments, since 2002 in the role of a Managing Director. From 2005 to 2008, he was a Senior Investment Officer with Alternative Investment Solutions, a fund of hedge funds within UBS Global Asset Management. In 2009, he was Head of Industry Research for the hedge fund platform at UBS Global Asset Management.

Alexander is the author of the two publications "In Search of Alpha: Investing in Hedge Funds" (October 2000) and "The Search for Alpha Continues: Do Fund of Hedge Funds Add Value?" (September 2001). These two documents were the most-often printed research publications in the documented history of UBS. He is also author of "Absolute Returns: The Risk and Opportunities of Hedge Fund Investing" (Wiley Finance, October 2002) and "Asymmetric Returns: The Future of Active Asset Management" (Wiley Finance, November 2006). Alexander has also written several research pieces pertaining to equity derivatives and hedge funds including AIMA's Roadmap to Hedge Funds (2008 and 2012), which has been translated into Chinese and was the most-often downloaded document from their website at the time.

Alexander holds a Bachelor of Science in Business Administration with a Major in General Management from the University of Applied Sciences in Business Administration Zürich (HWZ) in Switzerland. Alexander also holds the Chartered Financial Analyst (CFA) and Chartered Alternative Investment Analyst (CAIA) designations and is a certified Financial Risk Manager (FRM). He is on the Board of Directors of the CAIA Association and is a member of the AIMA Research Committee.

VC-PE Index: A Look at Private Equity and Venture Capital as of Q1 2014

Mike Nugent
CEO/Co-Founder, Bison

Mike Roth
Research Manager, Bison

About Bison:
Last month, Bison released its first quarterly benchmark report to fill the void left by ThomsonOne. We currently track performance for over 3,800 funds that is being reported by more than 200 investors.

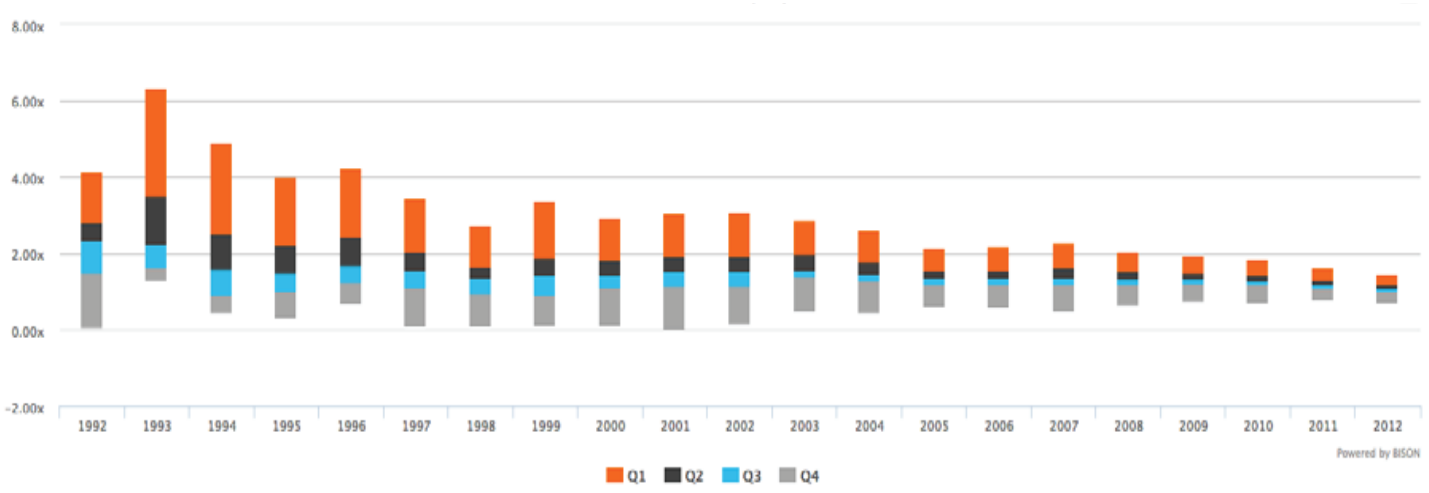
Going forward we will be releasing the Bison Benchmark Reports on a quarterly basis in preliminary and final versions. These reports are free to download on Bison (www.bison.co). Additionally, the benchmark is available to browse on our website, where you can also plot your funds' performance on the benchmark and export elegant charts. Bison currently provides nine segmented benchmarks for three geographies (Global, North America, and Global ex-North America) and three investment styles (All Private Equity, Buyout and Venture Capital / Growth Equity).

About the data:
Whether you look at H1 2014 or just Q1 2014, the public markets have been volatile. Global instability, QE (Quantitative Easing) or no QE, and worries about valuations getting ahead of themselves have all contributed to a few market ups and downs.

Private equity markets, unsurprisingly, were less volatile. Median returns in the private equity industry saw slight movements (both positive and negative) depending on the vintage year, with the funds from the last decade generally showing a positive trend.

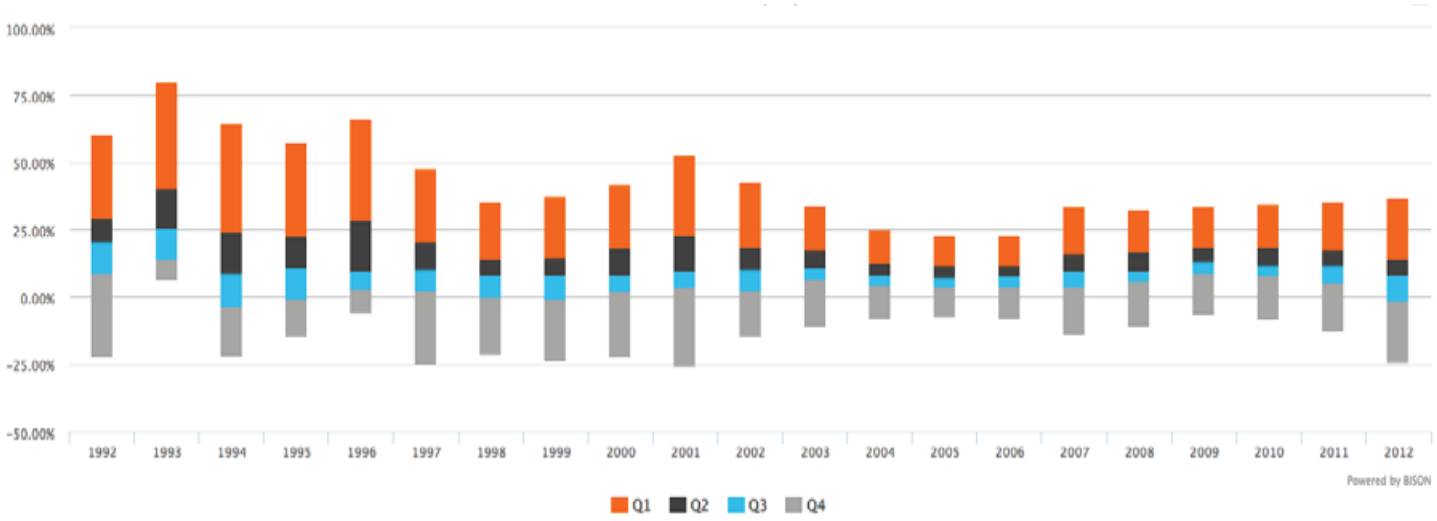
Looking at DPI numbers for the industry, older funds appear to be holding onto their investments a little longer than investors would like. Median funds over the last decade have yet to return 100% of the capital they have invested (DPI > 1.0x). This is not surprising for more recent vintages but a little unexpected for the older vintages, particularly 2004 and 2005.

Finally, Bison produces a Momentum metric for the industry that allows investors to see year-over-year valuation changes and determine whether their investments are keeping up with their peers. For example, the top 25% of funds from 2009 - 2012 have increased their TVPI multiple by more than 20% from Q1 2013 to Q1 2014.



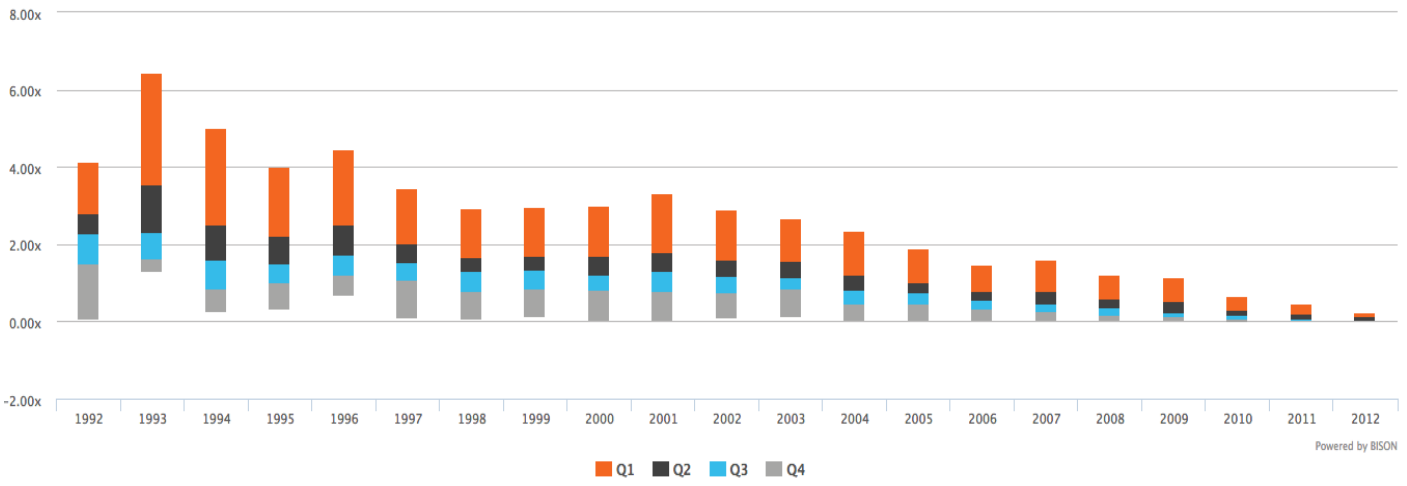
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Upper Fence	4.10x	6.28x	4.88x	3.96x	4.17x	3.42x	2.71x	3.35x	2.90x	3.03x	3.04x	2.83x	2.56x	2.10x	2.13x	2.25x	2.00x	1.91x	1.82x	1.57x	1.42x
Q1	2.77x	3.46x	2.47x	2.17x	2.39x	2.00x	1.63x	1.86x	1.79x	1.88x	1.88x	1.94x	1.75x	1.53x	1.53x	1.58x	1.48x	1.46x	1.40x	1.26x	1.15x
Q2	2.31x	2.21x	1.59x	1.46x	1.68x	1.53x	1.34x	1.41x	1.41x	1.52x	1.51x	1.53x	1.43x	1.35x	1.34x	1.36x	1.30x	1.31x	1.24x	1.15x	1.05x
Q3	1.45x	1.59x	0.87x	0.98x	1.20x	1.06x	0.91x	0.87x	1.06x	1.12x	1.10x	1.35x	1.22x	1.15x	1.14x	1.13x	1.13x	1.16x	1.12x	1.05x	0.96x
Lower Fence	0.04x	1.25x	0.42x	0.30x	0.64x	0.05x	0.07x	0.11x	0.09x	0.00x	0.12x	0.46x	0.41x	0.58x	0.55x	0.46x	0.61x	0.71x	0.69x	0.74x	0.69x
Funds	18	30	26	33	47	51	78	93	148	105	83	76	111	171	205	256	254	104	129	153	154
Commitments	20	38	30	49	64	85	145	173	314	211	155	146	203	411	532	659	509	260	300	278	347

Exhibit 1: Global All Private Equity TVPI Benchmark



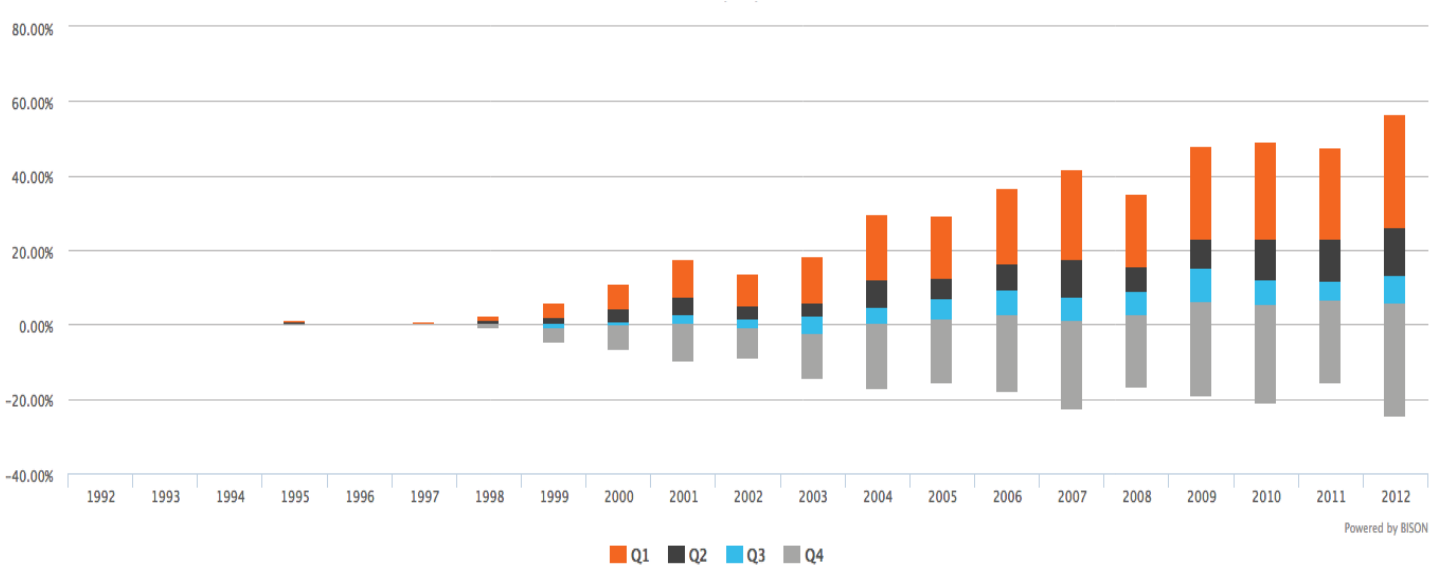
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Upper Fence	59.65%	79.36%	63.89%	56.69%	65.56%	47.16%	35.14%	36.71%	41.49%	51.85%	42.35%	33.72%	24.38%	22.27%	22.37%	32.93%	32.25%	32.86%	34.04%	34.80%	36.45%
Q1	28.68%	39.88%	23.09%	21.78%	27.60%	19.90%	13.77%	13.82%	17.29%	22.44%	18.01%	16.86%	12.09%	10.93%	10.91%	15.28%	15.94%	17.99%	17.95%	16.78%	13.50%
Q2	20.17%	25.04%	8.20%	10.43%	9.54%	9.96%	7.96%	7.77%	8.08%	9.56%	9.90%	10.44%	7.87%	7.18%	7.47%	9.65%	9.59%	12.60%	11.58%	11.20%	7.79%
Q3	8.03%	13.56%	-4.11%	-1.49%	2.30%	1.72%	-0.48%	-1.44%	1.15%	2.83%	1.78%	5.63%	3.90%	3.37%	3.26%	3.51%	5.07%	8.08%	7.22%	4.78%	-1.80%
Lower Fence	-22.94%	5.66%	-22.56%	-15.27%	-6.34%	-25.54%	-21.85%	-24.34%	-23.05%	-26.59%	-15.40%	-11.23%	-8.39%	-7.97%	-8.20%	-14.14%	-11.24%	-6.80%	-8.87%	-13.24%	-24.75%
Funds	16	29	20	30	44	44	69	86	136	96	76	72	103	157	192	247	241	91	114	131	117
Commitments	19	38	23	43	61	71	111	148	270	171	133	134	189	354	470	605	464	221	249	211	214

Exhibit 2: Global All Private Equity IRR Benchmark



Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Upper Fence	4.10x	6.39x	4.96x	3.96x	4.41x	3.40x	2.90x	2.91x	2.95x	3.29x	2.84x	2.63x	2.29x	1.85x	1.43x	1.55x	1.18x	1.10x	0.61x	0.43x	0.20x
Q1	2.77x	3.51x	2.47x	2.17x	2.47x	1.99x	1.61x	1.65x	1.64x	1.75x	1.56x	1.54x	1.17x	0.98x	0.75x	0.75x	0.55x	0.49x	0.26x	0.17x	0.08x
Q2	2.27x	2.29x	1.58x	1.46x	1.71x	1.51x	1.28x	1.32x	1.19x	1.26x	1.14x	1.12x	0.78x	0.72x	0.54x	0.43x	0.33x	0.22x	0.13x	0.04x	0.01x
Q3	1.45x	1.60x	0.82x	0.98x	1.18x	1.05x	0.74x	0.81x	0.77x	0.73x	0.70x	0.81x	0.43x	0.40x	0.29x	0.22x	0.13x	0.08x	0.03x	0.00x	0.00x
Lower Fence	0.04x	1.25x	0.24x	0.30x	0.64x	0.06x	0.02x	0.11x	0.00x	0.00x	0.07x	0.10x	0.00x	-0.00x	0.00x	0.00x	0.00x	-0.00x	-0.02x	-0.00x	-0.00x
Funds	18	31	26	33	48	51	80	95	150	103	85	78	115	176	207	257	257	106	129	155	156
Commitments	21	41	30	51	68	89	154	180	332	213	158	156	223	435	554	675	520	265	307	287	355

Exhibit 3: Global All Private Equity DPI Benchmark



Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Upper Fence	0.03%	0.00%	0.02%	0.81%	0.11%	0.28%	1.93%	5.57%	10.30%	17.21%	13.02%	17.82%	29.34%	28.95%	36.14%	41.05%	34.71%	47.42%	48.82%	47.04%	56.06%
Q1	0.01%	0.00%	0.00%	0.32%	0.05%	0.11%	0.74%	1.60%	3.77%	6.88%	4.54%	5.56%	11.78%	12.14%	15.76%	16.94%	15.29%	22.35%	22.43%	22.55%	25.67%
Q2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.23%	0.62%	2.37%	1.26%	1.97%	4.50%	6.69%	9.11%	7.13%	8.59%	15.00%	11.80%	11.57%	13.00%
Q3	0.00%	0.00%	-0.02%	-0.02%	0.00%	-0.01%	-0.06%	-1.04%	-0.58%	-0.00%	-1.12%	-2.61%	0.07%	0.94%	2.18%	0.87%	2.34%	5.64%	4.83%	6.22%	5.41%
Lower Fence	-0.02%	0.00%	-0.04%	-0.51%	-0.07%	-0.18%	-1.26%	-5.01%	-7.10%	-10.33%	-9.60%	-14.87%	-17.49%	-15.87%	-18.20%	-23.24%	-17.08%	-19.43%	-21.56%	-16.02%	-24.97%
Funds	18	28	26	27	43	47	67	80	131	91	73	62	97	144	165	212	201	73	100	108	96
Commitments	19	32	30	40	57	78	119	145	253	179	124	115	168	336	425	524	374	190	231	188	214

Exhibit 4: Global All Private Equity Momentum Benchmark

Author Bios

Prior to founding Bison, **Mike Nugent** held senior roles at SVG Advisers, LP Capital Advisors and HarbourVest Partners, and has more than $3B in private market commitments to his credit. Mike started his career in the public markets with the NASDAQ Stock Market, and also gained significant operating experience while running operations for a textiles manufacturer. He received his MBA from Boston College, and his BA from St. Bonaventure University. Mike lives on the North Shore of Massachusetts with his wife and two sons.

Mike Roth is the Research Manager at Bison and oversees the data collection and content production. Before Bison, Mike spent six years on the investment team at SVG Advisers. There, he conducted research and due diligence on buyout and venture capital funds in the Americas. Mike received his BA in Economics from Boston College and is a CFA Level III candidate.

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