



## PRMIA Members' Insights and Opinions

### The Benefits & Costs of Illiquidity: Part IV

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In part 4 of series we will continue discussing some of the disadvantages of illiquidity, especially as this relates to hedge fund investments.

#### DEFAULT AND LIQUIDATION RISK

The previous installment of this series emphasized the illiquidity of the underlying investments of certain types of hedge fund. Another source of illiquidity in hedge fund investments arises from the nature of the contract that investors enter into with hedge fund managers. Hari Krishnan of Morgan Stanley and Izzy Nelken of Super Computer Consulting note that:

“If a hedge fund has a one-year lockup, funds can typically only be taken out at the end of a calendar year following the year of investment. Thus, an investor who allocates money in January 2002 can only take the money out in December of 2003, and the effective lockup period is two years.”

During the lockup period, the hedge fund manager may alter the hedge fund's leverage level according to the manager's interests, which may not coincide with what is optimal for the investor. Krishnan and Nelken note that anecdotally a manager will alter their leverage policy according to how the hedge fund is performing with respect to its previous high watermark. Typically a hedge fund needs to outperform a previous high water-

mark before receiving an incentive fee.

The manager's leverage policy (or behavior) can have a meaningful impact on an investment's performance. Say an investor believes in the underlying investment process that a hedge fund is pursuing. Say those returns have a certain mean return and standard deviation. The returns that the investor will actually receive will be very path-dependent since the hedge fund manager will likely alter their leverage level according to how performance compares to the previous equity high.

Krishnan and Nelken note that if a hedge fund reaches a certain loss threshold, the manager may substantially decrease leverage in order to prevent redemptions and therefore lose an ongoing management fee stream. They note that once redemptions occur, there may be a further sharp decline in the value of the hedge fund's investments due to concentrated liquidation pressure.<sup>1</sup> On the other end of the performance spectrum, once a hedge fund earns a certain amount in a year, the hedge fund manager may also decrease leverage in order to “coast.” Perhaps earning greater than expected returns would alarm clients about the risks being taken so that there would be limited benefit in posting extraordinary returns. Finally, if a hedge fund's returns are in the neighborhood of the previous high watermark then the manager may use maximum leverage to increase their future expected incentive compensation.

An interesting consequence of the path-dependent nature of hedge fund returns, under this model of hedge fund manager behavior, is that if one had another investment that had the same underlying return process but did not have lock-ups (and incentive fees), then one would expect a different return

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#### Points of Interest

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- Major Universities Endorse PRM Certification Program
- Over 1,200 Active PRM Candidates from 80 Countries
- Geoff Kates, Bob Mark, Alexander Shipilov Elected to Executive Committee

stream to accrue to the end investor. This is because the dynamic leverage scheme outlined in the previous paragraph would likely not occur.

Based on Krishnan and Nelken's framework, one can figure out the cost of the illiquid nature of hedge fund contracts as follows. Create a well-specified underlying return generating process; come up with a model of a hedge fund manager's leverage policy; and figure out the threshold level of losses at which investors will attempt en masse to liquidate their investments. Calculate the risk-adjusted returns of the underlying return generating process absent dynamic leverage and forced liquidation pressure. Next calculate the risk-adjusted returns of the hedge fund investment, complete with the manager's and investors' behaviors factored in. The difference in these two risk-adjusted returns provides one with a measure of the cost of this form of illiquidity.

## STALE PRICING

### Inaccurate Relationship Between Investments

Another signature aspect of investing in illiquid investments is that these investments may be marked based on old (or "stale") prices. If one uses unadjusted historical data to compare liquid and illiquid investments, one may not be getting a true picture of the underlying economic relationship between these investments.

The principals of AQR Capital Management have built a convincing argument that the lack of relationship of hedge fund indices to the S&P 500 is largely due to the reporting of stale prices for hedge fund positions. The authors use the CSFB/Tremont hedge fund indices in their research.

When the authors regress the CSFB/Tremont Aggregate Hedge Fund Index's returns versus lagged returns of the equity market, they find a strong relationship between the hedge fund index and the S&P using data from January 1994 to September 2000. Because there is such a strong relationship once they compare the hedge fund index's returns to dated returns in the stock market, they infer that hedge funds making up the index may have been using stale pricing in evaluating their holdings.

Investors might consider hedge funds for their portfolios because they would like to diversify away some of their equity market exposure. Given that investment rationale, the AQR researchers recalculate the Sharpe ratio of a number of hedge fund styles if one hedged out their true equity market exposure taking into consideration the stale-pricing effect.

With several noteworthy exceptions, the researchers find that the attractiveness of a number of hedge fund strategies

declines fairly dramatically. Further, they find that the adjusted Sharpe ratios are mostly negative, indicating that at least over the period, January 1994 to September 2000, there is no evidence that most categories of hedge funds were able to add value after taking into consideration their actual equity market exposure.

### Real Economic Impact

Mila Getmansky, Andrew Lo, and Igor Makarov of the MIT Laboratory for Financial Engineering note that the economic impact of stale pricing "can be quite real." In a very timely analogy, the authors note that the "spurious serial correlation [induced by illiquidity] can lead to wealth transfers between new, existing, and departing investors, in much the same way that using stale prices for individual securities to compute mutual-fund net-asset-values can lead to wealth transfers between buy-and-hold investors and day-traders."

In the next installment of series, we will cover the valuation risk that arises if a fund manager elects to imperfectly value a portfolio of illiquid securities. We will also begin to discuss several researchers' approaches that correct for any intentional or unintentional return smoothing on the part of managers of illiquid investments.

*<sup>1</sup> Clifford De Souza of Citigroup's Fund of Hedge Fund's unit has formally modeled the probability of a fund being at risk to concentrated liquidation pressure. Given a fund's expected return, volatility, and latest high watermark, there is some threshold negative performance level at which a cycle of redemptions starts to occur, which leads to more redemptions, which then puts the fund's survival at risk. The market extracts a premium from a fund in distress. One can calculate the probability of a fund entering into a "critical liquidation cycle" based on how far away the current NAV is from the threshold negative performance or "barrier" level, normalized by the fund's return and volatility. De Souza uses the mathematics of barrier option pricing to come up with this probability.*

### References

Asness, Clifford, Liew, John, and Robert Krail, "Do Hedge Funds Hedge?," *Journal of Portfolio Management*, Fall 2001, pp. 6-19.

De Souza, Clifford, "Leverage and Hedge Funds," Riskinvest USA 2003 conference, Boston, 11/4/03.

Getmansky, Mila, Andrew Lo, and Igor Makarov, "An Econometric Model of Serial Correlation and Illiquidity in Hedge Fund Returns," MIT Laboratory for Financial Engineering, 4/28/03.

Krishnan, Hari and Izzy Nelken, "A Liquidity Haircut for Hedge Funds," Risk Magazine, April 2003, pp. S18-S21.

This article originally appeared in Risk Magazine and in a book from Risk Books, [Intelligent Hedge Fund Investing](#)

## New Products for a New Exchange Environment

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It was the fifty year anniversary of the Futures Industry association. My job as moderator was to focus on key developments from 1955 to the present and create a dialogue about the next half century. This gave me the opportunity to reflect on changes to the industry, the mix of products traded and the general success of innovative futures contracts. I couldn't help but compare the new environmental products we're seeing now, particularly carbon dioxide emission allowances here and in Europe, to the T-bonds and other vanguard financial derivatives – I have the same optimism for these environmental products as I did for the financial futures, and I think the numbers support my case.

Futures markets do, fundamentally, exist to mitigate price risk and to facilitate price discovery – they have and they always will. But daily trading up the street at the Chicago Board of Trade, the world's oldest futures exchange, is no longer dominated by the wheat and oats that our grandfathers traded. Over 86% of CBOT futures volume today is made up of treasury bonds and notes and interest rate, equity index and foreign currency products, with agricultural contracts making up a little over 13% of the Jan-Sept 2005 vol-

ume. Nationally, the financial futures make up close to 83% of trading volume. The wheat's still around, but in 1975 the wheat, corn and soy products made up 88% of CBOT's annual volume; the GNMA mortgage contract, the only financial derivative traded, made up 0.1% of volume that year. The statistics for U.S.-wide futures trading exhibit the same trend. This is a tremendous change, and a sign that the world has dramatically wider avenues for managing a dynamic set of risks than it did before the introduction of financial derivatives 30 years ago. In addition to the swing in volume shares, total U.S. futures trading volume has risen to more than 85 times the 1975 level – and only a third of futures today are traded through U.S. exchanges.

Not only are different products being traded, but they're being traded differently. The growth in U.S. exchange futures volume may seem incredible, but it is truly astounding when one notes that only about a third of the global futures volume is traded through U.S. exchanges; in 1975, organized futures trading outside of U.S. exchanges was virtually non-existent. At the same time, however, geography is diminishing in its importance: it's well understood that much of the volume growth has been fueled by the emergence of electronic trading. For example, around 60% of the Chicago Mercantile Exchange's volume went through its Globex® electronic system in 2004, and that figure is closer to 70% to date for 2005. Ironic, given that the Chicago exchanges owe 100 years of dominance to human ingenuity and the confluence of Lake Michigan and a new railroad system. The old open-outcry system is giving way to pressure from heavily electronic exchanges abroad, but there's no need for nostalgia: electronic trading democratizes the markets even further, by giving access to anyone with a modem and a clearing firm. It's less labor-intensive and therefore less expensive for the customer, and the resulting increased volumes generate profits for the exchange.

A dramatically different operational landscape would suggest that exchanges today ought to be managed differently than

## Over 330 Jobs Posted On the PRMIA Jobs Board: 125 New This Month

The PRMIA Jobs Board is a free resource to PRMIA members. Over 30,000 job searches take place each month on the board and this month, over 330 Jobs in 23 countries are listed.

### Head of Operational Risk

Salary: Competitive

Riyadh, Saudi Arabia

Each month we randomly feature some of the latest postings, but be sure to search the entire database to see what is available. All job listings can be found by clicking <http://prmia.org/INDEX/Jobs/jobs.php>

### Quantitative Risk Manager

Salary: Competitive

New York, US

If you're looking to hire, you can post your openings for free and can even use the search utility to find a certified PRM to meet your needs.

### Head of Credit Risk

Salary: Competitive

Tokyo, Japan

they were when agriculture dominated the markets. The position of Exchange President didn't exist at the CME before 1953, and the CBOT hired its first non-member president three years later. Nearly 30 years after professionalizing its management, the CME became the first U.S. financial exchange to go public in December of 2002. The CBOT completed its IPO in October of this year. The market capitalization of the CME was \$13.3 billion in 2004, and estimates put the Eurex market cap at over \$17 billion and the Deutsche Borsche's at \$21.5 billion. Compare that to General Motors' 2004 market cap of \$15.4 billion, and one gets a sense of the real value of these exchanges. The transaction and clearing fees generate revenue, but there's intellectual and human capital in these institutions as well.

The increasing value of exchanges worldwide indicates that they are facilitating increasingly important risk-management services. Futures exchanges do a lot more now than mediate the price of a loaf of bread – trading in currency and interest rate derivatives can impact the power balance of world economies. The market evolution to date has been dramatic, but what's next?

The accelerated modern trading atmosphere generated by electronic trading and executive exchange management should serve to benefit any new product that can take hold. I wrote in my first PRMIA article that environmental futures will become a major product group over the coming years, and I think that greenhouse gas emissions trading is one such product with staying power. Let's compare the first months of European Union carbon dioxide emissions trading to the first years of the new interest rate derivative products traded on U.S. exchanges. The T-bonds, T-notes and interest rate swaps now trade over 340 million contracts a year on the CBOT, making up 80% of the exchange's total annual futures volume. The contracts had a modest compound annual growth rate to start, though, of just 1.1% in U.S. exchanges over the period 1975-1979. European carbon dioxide allowances, in comparison, have seen a 7.1% compound growth rate since they started trading on EU/UK exchanges in February of this year. Evidence from the U.S. sulfur dioxide emissions market suggests that the success of EU emissions trading is not a fluke: the volume of trading in the sulfur dioxide market sustained a 14% compound growth rate between 1994 and 2003, and CCX market research suggests that trading levels have maintained since. These emissions are actively being used to manage the cost of environmental compliance, and for proprietary trading. With an underlying stock of 4.2 billion metric tons of tradable carbon dioxide in the EU - and 24 billion metric tons worldwide – the potential value of the global carbon market could be tremendous.

The most significant opportunities in the derivatives markets today lie in applying these risk management tools to environmental and social problems. What a joy!

## U.S. Community Bankers on Basel II

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The parochial political reaction in the US against the Basel II proposal has put Washington in the unenviable position of being a follower - at best - in the global movement to craft a new bank capital adequacy framework. The reason is the basic reality of election-year politics and the growing likelihood of GOP rout next November.

For the same reasons that the Bush Administration is secretly preparing to declare victory and withdraw militarily from Iraq before next year's mid-term election, members of Congress are falling over themselves to defend powerful community bankers from the alleged predations of foreign banks, a threat supposedly enabled by Basel II.

In last week's hearings before the Senate Banking Committee, witnesses and members alike wrung their hands over the possibility of large foreign banks, advantaged by the Basel II proposal, picking off better capitalized community banks in the US. "Exhibit A" of the indictment against Basel II is the latest Quantitative Impact Statement ("QIS") 4 survey, which shows sharp decreases in US bank capital were Basel II adopted. [Click here](#) to view a copy of the summary results of QIS 4 published by the FDIC last month.

What few members of Congress or regulators seem to know or at least articulate is that most banks, inside or outside the US, will never qualify for the Advanced Ratings Based ("IRB") standard that would justify significant reductions in capital from Basel I levels. Even were the reductions in minimum levels of bank capital suggested by the QIS 4 survey correct, and most observers believe they are not, it seems fair to say that most banks outside the US would never experience such reductions.

Neither do the critics apparently notice that community banks in the US are very expensive at the moment and that foreign banks have an abysmal investment record in making acquisitions in the US banking market. The recent example of Banco Santander (NYSE:STD) taking a stake in underperforming Sovereign Bancorp (NYSE:SOV) hardly qualifies as a full-scale assault on America's community banks.

Yet many of the critics miss the practical reality driving adoption of Basel II globally, namely that all banks around the world need to improve risk management standards. For some years now, regulators have been trying to quietly encourage smaller banks to improve risk management methods - the true purpose

of Basel II. The response so far from the US community bank lobby and their partisans in the Congress is "Foxtrot Oscar."

Smaller US banks that do not embrace at least the foundation IRB approach of Basel II, however, are going to be canon fodder in the global marketplace for financial services. US community banks which refuse to adopt even the most basic, foundation IRB approach of Basel II will not just be at a disadvantage vis-à-vis the largest global institutions, but also relative to their smaller peers outside the US.

In the EU and other major industrial economies, all banks are being effectively required to adopt the foundation IRB approach so that a general improvement in risk management standards occurs over a period of 5-10 years. Indeed, if the US decides not to adopt Basel II at all - a very real possibility - the equally real disparity will be between, for example, smaller EU banks that are foundation IRB compliant vs. their peers among US community and regional banks which continue to adhere to Basel I.

Lower capital requirements is the ultimate reason why some of the largest banks pursue Basel II, but the benefit from a national interest perspective is improving risk management among all US banks and aligning capital levels with actual risks. As Federal Reserve Board Chairman-designate Ben Bernanke told the Senate Banking Committee today, "Basel II or something like it appears to be necessary," but the Congress appears to be a long way from allowing adoption of the current Basel II proposal.

## Economic Capital for Business Performance Measurement

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Disclaimer: The views are those of the author and do not necessarily represent the views of the Federal Home Loan Bank of Boston.



There are several types of capital. Book capital is determined by accounting rules. Regulatory capital is determined using rules defined by regulators. Market capitalization is equal to a company's share price multiplied by its number of outstanding shares. Bank's, however, increasingly compute still another form of capital – so-called "economic capital" – in order to better manage business performance. To see how, it is first necessary to explain a few additional concepts.

Market value of equity (MVE) can be defined as the difference between the market value of assets minus the market value of liabilities plus the net market value of off-balance sheet obligations. The amount of potential adverse change in MVE due to all relevant risk exposures is then calculated. This amount pro-

vides a natural estimate for the minimum amount of capital necessary to preserve the firm's long-term viability. As such the amount of potential adverse change in MVE provides a measurement of needed economic capital. Economic capital can also be computed in a similar manner to equal the loss potential posed by the activities of individual business units.

It is important to note that risk exposures that might cause a potential loss include potential adverse changes in market rates and prices, counterparty defaults, operational errors and other types of risk. Since the time it would take to hedge or otherwise mitigate these risks varies according to risk type, the calculation of economic capital should incorporate potential future adverse outcomes that could occur over the associated – period of risk. The period of risk would equal either the maturity of a transaction, the time it would take to sell an asset, settle a liability, or the time necessary to fully and effectively hedge all residual risks.

Once determined, economic capital provides a measure of capital necessary to support a business activity and the associated time horizon over which that capital would be required. Note that if economic capital is re-estimated – and as a result would change in value during the remaining tenor of a business activity – then it may be reasonable to assign the associated estimate for the average required capital for that business activity.

Finally, business performance can be estimated as the net return generated by the business activity measured as a percentage of the economic capital necessary to support that activity. For example, net return could be measured as interest earnings minus expenses, such as loan loss provisions and hedging costs. Note that for purposes of performance measurement, hedging costs would include estimates of expected future hedging costs associated with potential future periodic hedge rebalancing.

In the case of business activities that are mark-to-market, such as trading activities, profit may be recorded at transaction inception. In such cases, performance measurement calculations should assume that such initial profits are rather realized over the time horizon associated with the supporting economic capital. This calculation adjustment is necessary in order to better align the realization of benefits from business activities with the manifestation of risks posed by those activities.

Economic capital can be a useful tool for business performance measurement as it provides an indication of the true risk-return relationship posed by business activities.

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## PRMIA News and Items of Interest

### PRMIA Members Elect Board, Regional Directors Elect Board Leadership

In keeping with PRMIA's governance focus on member control of the organization, elections were held in October for three openings on the PRMIA Board of Directors. Following this, the leaders of PRMIA's Regional Chapters elected new Officers of the PRMIA Board.

Congratulations to Geoff Kates of London, Robert Mark of San Francisco and Phang Hong Lim of Singapore for being elected to the PRMIA Board.

Election tallies can be viewed by [clicking here](#).

Geoff Kates was subsequently elected Chair of PRMIA's Board of Directors, while Robert Mark was elected the new Vice Chair of the Board. Alexander Shipilov of Toronto was elected Secretary/Treasurer, a position which he has held since PRMIA's Board was formed.

David R. Koenig and Andrzej Kulik retired as Chair and Vice Chair, respectively. Both remain active members of the PRMIA Board.

### PRMIA Members Asked to Become Sustaining Members of the Association

This year the PRMIA Board, with the support of PRMIA's Regional Directors, has decided to introduce a new paid membership level to PRMIA. As an association under the direct control and run for the benefit of its members, this new offering allows members to show their financial commitment to the success of PRMIA.

Over the past three-plus years, volunteers have donated more than 70,000 hours of time to build PRMIA to what it is today. While the growth has been remarkable, the opportunities for further contributions to the growth of the risk profession are many. The sure footing that paid membership provides allows PRMIA to expand its work...to the benefit of our members.

We remain committed to serving all in the profession, consistent with our non-profit ideals. So, discounted memberships are available for students, academics and those in emerging markets. For those who cannot afford to pay, we continue to offer a free membership.

The Board of PRMIA asks that all who find the resources of PRMIA to be beneficial take this opportunity to demonstrate "ownership" of the association and commitment to our principles.

### New PRMIA Website: PRMIA Links

The PRMIA Links Risk Professional Network allows you to build an online community among other PRMIA members. When you visit My PRMIA Links Network, we will recommend several members to you who share your interests. You can preview their profiles and invite them to become one of your PRMIA Links.

Many of your colleagues are also PRMIA members. Through the PRMIA Links tool, you can search the Members Directory and invite them into your network.

Once you're linked, you can share news, event invitations, links that you find online, and much more. It's your online network of risk professionals around the world.

### Making the Most of the PRMIA Links Professional Network

- Be sure that all of your membership profile information is up-to-date.
- Invite all of the people you know are PRMIA members to join your network.
- Create small network groups around specific themes.
- Regularly share documents, presentations and other resources you find with your network groups.

Getting There: [PRMIA Links Network Page](#)

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### Top Scores in Fourth Quarter of 2005

Exam I - Finance Theory, Financial Instruments and Markets

**Bjorn Huther, Frankfurt, Germany**  
**Nicola d'Auria, Milano, Italy**

Exam II - Mathematical Foundations of Risk Measurement

**Ho Kei Yee, Hong Kong**

Exam III - Financial Risk Management Practices

**Guerman Zoubarev, Abbotsford, BC, Canada**

Exam IV - Case Studies, Standards of Best Practice, Conduct and Ethics, PRMIA Governance

**Yoram Lustig, London, United Kingdom**



**Congratulations to the Top PRM Candidates**