

NORTHFIELD

Northfield's 24th Annual Summer Seminar

Friday, June 7, 2019

International Tennis Hall of Fame, 194 Bellevue Avenue, Newport, RI

We are pleased to invite you and your colleagues to our annual summer seminar. The purpose of the seminar is to present recent research and technical advances to our clients and friends while enjoying the many pleasures afforded by our unique venue.

Newport has long been a famous sailing center and home of the America's Cup Races, as well as a cherished place to tour. This year we return to the International Tennis Hall of Fame, a venue that will allow us to take advantage of Newport's lovely summer days. The Newport Casino was designed as a social and sporting club and was the center of cultural life for the Astors, Vanderbilts and Newport Society in the "Gilded Age." Designed by Stanford White and considered a masterpiece of Victorian shingle-style architecture, the complex has a picturesque interior courtyard and oriental latticework screens that contribute to the buildings' many shapes and textures. The USTA Wing & Porch provides a private room with an extensive glass wall and doors that open to a 100-ft. long porch overlooking the Casino's horseshoe grass court.

As always, our meeting date has been selected to coincide with the US Professional Championships of Court Tennis. This year's tournament promises to be especially strong with a majority of the top 10 players in the world, including world champion Camden Riviere of the USA. Court tennis is the medieval sport that is the progenitor of all modern racquet sports. Played by royal devotees such as Louis XIV and Henry VIII, it is perhaps the world's most exclusive sport. Quantitative finance professionals will appreciate that due to the complexity of matches, a paid expert is required just to keep score.

After tennis on Friday evening, dinner will be at Gurney's Resort on Goat Island for a waterfront dinner party. We look forward to seeing you!

View from the USTA
Wing & Porch overlooking
one of the grass courts.



View from Gurney's
Resort overlooking
Narragansett Bay

Registration, Travel Arrangements and Accommodations

There is no charge for participation in any aspect of this event. We will accept any donation you might care to make on behalf of the Pine Street Inn, Boston's primary homeless shelter. Registrants are responsible for the cost of their transportation and lodging. Please note - we are accepting registrations online only at <https://www.northinfo.com/events.php>. As always, attendees are welcome to bring a guest for tennis and dinner. For those planning to spend the night in Newport, ***please remember that this is a BUSY time in NEWPORT and most hotels have very limited space. Gurneys does have limited availability, please contact them directly at (401) 849-2600.*** Other recommendations are the Viking Hotel and Newport Harbor Hotel and Marina are recommended, along with the Newport Harbor Marriott and the Hyatt Regency Goat Island. Newport also has many delightful inns: further information is available at <https://www.newportinns.com>. For all questions, please contact Kathy Prasad at 617-208-2020 or kathy@northinfo.com. The deadline for all reservations is Wednesday, May 29, 2019.

International Tennis Hall of Fame
194 Bellevue Avenue
Newport, RI 02840
Phone : 401-849-3990

For more information regarding Tennis Hall of Fame
<https://www.tennisfame.com>

Gurney's Resorts
1 Goat Island
Newport, RI 02840
Phone: (401) 849-2600

For more information regarding Gurney's
<https://www.gurneysresorts.com>

Agenda

8:30 AM **Continental Breakfast**

9:00 AM **Welcome**

9:00 AM **Illiquidity Risk of Truly Illiquid Assets**

Emilian Belev

It is a very common perception that investors dislike being constrained by liquidity of their investments at their investment horizons. There has been a notable amount of academic and practitioner research work to try and capture the disutility of illiquidity and its implication to risk and return. Most of those studies have been done from the perspective of endogenous variables that measure this disutility – expected return premium for illiquidity or inferred from bid-ask spreads. Several years ago, we presented an approach based on a simulation of liquidity constrained optimizations as another endogenous approach to liquidity risk estimation. In this work we present an exogenous, transaction frequency-based approach, that is economically synonymous with our prior work, but empirically more tractable, granular, and transparent. We will use examples from private equity and commercial real estate to illustrate the new methodology. One of the implications of this work is an explicit way to measure the expected cost of risk for asset types that don't have well defined data for bid-ask spreads.

9:50 AM **On the Value of Portfolio Construction**

Jason MacQueen

Active portfolio management consists of two steps: stock selection and portfolio construction. Many managers spend most of their time on stock selection, and then deal with portfolio construction by following some simple heuristic, such as equal-weighting or capitalization-weighting. Most ETFs, for example, use one of these methods.

Unfortunately, this is virtually guaranteed to result in inefficient portfolios that do not trade-off expected return against risk, and which may well have exposures to significant unintended bets. The managers stock selection skill can easily be dominated by the returns to these unintended bets.

In this presentation, we use a simple stock selection rule (similar to those used to create some Style ETFs) and test a number of different methods of portfolio construction. These will include equal-weighting, capitalization-weighting, attribute-weighting, risk parity weighting and Markowitz optimization. Each of the strategies is rebalanced quarterly from the end of 2005 to the present. Since the stock selection is always the same, the differences in performance and turnover are due entirely to the different methods of portfolio construction. You may be surprised by the results!

10:40 AM **Coffee Break**

10:55 AM **Dynamic Replication and Hedging: A Reinforcement Learning Approach**

Petter Kolm, New York University

In this talk we address the problem of how to optimally hedge an options book in a practical setting, where trading decisions are discrete and trading costs can be nonlinear and difficult to model.

Based on reinforcement learning (RL), a well-established machine learning technique, we propose a model that is flexible, accurate and very promising for real-world applications. A key strength of the RL approach is that it does not make any assumptions about the form of trading cost. RL learns the minimum variance hedge subject to whatever transaction cost function one provides. All that it needs is a good simulator, in which transaction costs and options prices are simulated accurately.

11:45 AM **Cross-Asset Class Momentum**

William Zieff

The concept of “price momentum” exposure is very familiar to anyone who has studied equity return factors. What has been less addressed in the literature is how momentum effects in one asset class may manifest in other asset classes. Since the advent of the contingent claims framework of Merton (1974), there is a clear theoretical link between the return impact of equity factor exposures and the returns of corporate bonds of related issuers. This contemporaneous relationship has been described in research by MacQueen and Mostovoy (2018), deJong (2018), and Bektic (2017, 2018). All these studies confirm the expected relationship between equity factor exposure and returns to credit risk exposure in corporate bonds. In particular, the equity “momentum” factor has shown among the strongest empirical results of commonly used equity market **risk model** factors. We will illustrate the strength of this relationship with an update of the MacQueen and Mostovoy study **using** an extended sample period. In addition, we will present both a theoretical description and empirical results in two other cross-asset class momentum relationships. First, we will consider the relationship between equity momentum (as a measure of economic prosperity) and real estate. This concept is embodied in the Northfield Private Real Estate Model with a linkage between equity sector momentum and the employment profile of a given geographic area (see

Gold, *Northfield News*, January 2018) and Bahmani-Oskooee and Ghodsi (2018). Finally, we will consider whether momentum in private equity markets is predictive of subsequent equity market returns. Such a relationship has been asserted at the equity sector level by Krizman, Turkington and Czaronis (SSRN 2017). We will **review work currently underway that examines** whether the “number of deals” and “capital allocated” in private equity market rather than returns is predictive of public equity market returns.

12:35 PM **A Newport Luncheon**

1:45 PM **Dissecting Duration Times Spread**
Dan diBartolomeo

In recent years, the “Duration Times Spread” (DTS) methodology has become the most commonly used approach to estimate the risk of bond portfolios. DTS was first formalized by Ben Dor, et. al. (*Journal of Portfolio Management*, 2007). Put simply, it suggests that the volatility of the portion of bond yields associated with credit and liquidity risks (i.e. OAS) is linearly related to the magnitude of the spread itself. Effectively what matters is the percentage change in the spread (e.g. going from a 200 bps spread to a 400 bps spread is a 100% change). This functional form implies that volatility of spreads will be linearly related to the level of the spread, so when spreads increase so will the expected volatility of the spreads and vice versa. While this construct fits empirical data very well there are a number of limitations to this approach of which investors must be aware. The first matter of interest is that arithmetic value of the “duration times spread” is exactly the *maximum amount by which a bond portfolio can increase in value* due to the portfolio becoming riskless with respect to creditworthiness and liquidity. Most investors would find the idea of measuring risk by how much a portfolio can increase in value unintuitive. Implicit in the idea that a measure of “upside” should be considered an estimate of risk is that the *distribution of credit related returns for a bond portfolio is assumed to be symmetric*. We would clearly not expect the returns of a single bond issue subject to default risk to be symmetric. Under the Central Limit Theorem, we can justify not only the expectation of symmetry but also normality for the distribution of returns. However, the requirements of the CLT are that we are summing a large number of independent return distributions (i.e. the returns of individual bonds). To the extent that the creditworthiness and liquidity of the bonds in a particular portfolio are likely to be correlated rather than independent there must be a degree of portfolio concentration such that the CLT requirements are not met and *the expectation of symmetry must fail*. This situation is similar to the assumptions made under the Gaussian Copula process for debt securitizations by Li (*Journal of Fixed Income*, 2000) which were subject to material criticism in the “Global Financial Crisis” period. The second limitation of DTS that as the creditworthiness of a bond falls investors *must eventually reach a point where there is a high degree of certainty that a particular bond will default*. In such a case, the value of the spread should increase (the expected loss is increasing due to the likely default), but the volatility of the spread should decrease as investors reach consensus that the bond will indeed default. This situation contradicts the basic DTS premise that the volatility of spreads should be linearly (positively) related to spread levels. Finally, we would note that all empirical research on fixed income securities may be limited in the sense that the widely disseminated prices for bonds are derived *estimates* typically from “matrix pricing” models with limited amounts of actual trade data as input. As such, the in-sample explanatory power of any such model may be materially overstated because the matrix pricing model and the risk model simply have common underlying assumptions. We will consider all these limitations and particularly discuss how they relate to traditional credit risk concepts like probability of default (PD) and loss given default (LGD).

2:45 PM **Court Tennis Demonstration**

3:15 PM **Semi-Final Match, the US Pro Court Tennis Championships**

6:00 PM **Reception and Dinner, Gurney’s Resort**