

Catching FIRE

THE OFFICIAL NEWSLETTER OF THE NYU TANDON DEPARTMENT OF FINANCE AND RISK ENGINEERING





Letter from Department Chair: Peter Carr

Amidst the bustle of Fall 2020 classes, I hope you will find some time to browse our semi-annual FRE newsletter, "Catching FIRE." This tradition continues despite a global pandemic roiling both higher education and presidential politics. My kudos and thanks to the FRE staff, especially Zahra Patterson, for making this newsletter a (virtual) reality. I hope you enjoy reading it at least half as much as we enjoyed putting it together.

Peter Carr Nearly Broke the Internet During Stevens Institute of Technology's FE Seminar Series

The Financial Engineering Seminar Series at Stevens featured Peter Carr on August 27, 2020. The recurring event

spotlights leaders from industry and academia, who bring their expertise in a variety of important topics within the discipline. Carr's remote talk, "Adding Optionality," almost overwhelmed the school's on-line systems as his lecture attracted a much larger than usual audience. Watch for yourselves on Youtube at

<https://tinyurl.com/yymczu8d>

FRE Teams Take Two Top Spots in the IAQF Academic Case Competition

On Friday, October 30th, the five winning teams who participated in the IAQF Academic Case Competition gave virtual presentations to discuss their results. The event was moderated by IAQF Board of Directors Chair Rich Lindsey.

We are proud to announce that two of the winning teams were from the Finance and Risk Engineering Department at NYU Tandon: Team QuAntiochus, captained by Yingchao Sun, and Team Bobcat, captained by Vinay Arun Bharath. The actual competition began in late February, and teams had six weeks to prepare their analysis. Each team was challenged to differentiate between two separate portfolios, from the Republican Party and the Democratic Party, to observe the differences in volatility profiles. Teams used Twitter and Factor analysis to separate them and then built a structured note around their findings.

The actual case was based on Julius Baer, a Swiss private bank. The bank had announced they would sell as much as \$40 million of structured notes tied to U.S. companies that they had determined would do well based on which party won the U.S. presidential election in 2020. They had developed two set of stocks, which they expected to exhibit differential performance. For competition purposes, teams would assume these to be equally weighted portfolios.

The goal for each team was to determine through quantitative methods whether there were truly

differences between the two portfolios, to highlight those differences, and to examine if the portfolios should be expected to perform differently, depending on whether the occupant of the White House was a Republican or a Democrat. Yingchao Sun stated, "When you analyze real world data, you are always met with challenges. This time, we analyzed the stock price movement of two portfolios, which are believed to perform significantly different based on which party would win the election."

Adjunct Professor Ron Slivka, the team's advisor, attended the virtual presentation and shared his sentiments. "The IAQF competition presented students an opportunity to use their quantitative skills to analyze industry problems they might realistically find when fulltime employed," he said. "I was very pleased to coach NYU Teams in this competition, but all congratulations belong to the students who worked so diligently and smartly in devising team solutions."

"It was a very interesting and fun problem statement to work on," said Vinay Arun Bharath. "We used multiple approaches to support our case and Professor Slivka guided us in developing a structured product from our findings."

Congrats to the two winning FRE teams: QuAntiochus (Yingchao Sun, Litai Ren, Sumit Mahaveer Sethi, Sai Theja Vadlamani, Dehao Wang, and Ziqi Yuan) and Bobcat (Vinay Arun Bharath, Lei Guo, Eric Sun, Yiran Wang, Yulin Wu, and Minghua Xie).



Einstein's velocity addition formula keeps the

"sum" of two

velocities inside

$[-c, c]$,

where c is the speed of light. Similarly, a

\$1

bet that a security will be priced below a threshold must have a value inside

$[-1, 1]$.

We explore the consequences of reducing derivative security valuation to a generalized sum. We find in particular that the value of repeated optionality is just repeated generalized summation.

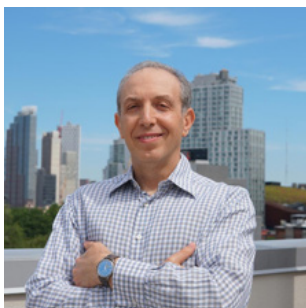
As a result,

we can value particular kinds of Bermudan options in closed form and hedge them with vanillas.



Faculty Highlights:

The Department of Finance and Risk Engineering (FRE) is welcoming a group of new instructors who bring with them incredible industry experience, real-world insights, technological savvy, and even a few surprising talents.



Serge Feldman

Serge Feldman has never been the type of person to maintain the status quo. He is constantly reading, learning, and exploring new topics. That's why as a senior hands-on software development leader working at various financial institutions, he was inspired one day to pick up the book *My Life as a Quant: Reflections on Physics and Finance*, by Emanuel Derman. A wry memoir whose epigraph reads "Ambition is a state of permanent dissatisfaction with the present," it caught Feldman's imagination. Strictly speaking, he was far from dissatisfied with his work, but he imagined himself expanding his horizons as Derman had done.

An avid researcher, Feldman investigated all of the financial engineering graduate programs in the city and quickly decided upon NYU Tandon. "It was the only one taught predominately by practitioners, and I wanted to get that kind of practical, real-world instruction," he explains. Now, Feldman — who worked full time while earning his M.S. (not to mention helping

take care of his newborn) — will be one of those practitioners helping Tandon's FRE students get real, hands-on experience. He'll be teaching a lab course on financial software engineering and envisions his students building a working program by the end of the semester, making them attractive candidates for employers looking for candidates with proven, solid skills.

Feldman is happy to be back at Tandon's Department of Finance and Risk Engineering, but the truth is he had never strayed far, geographically or otherwise. After graduating in 2011 he began working for J.P. Morgan in New York City, and he now serves as a Global Head of Development for Risk Reporting Technology, where he has been managing a global cross-functional team to develop and support a multi-asset Market Risk Management platform. Throughout, he returned to campus whenever he could to hear the high-profile speakers in the department's regular lecture series. "I appreciated the chance to hear different ideas and opinions," he says, "and the level of speakers was so high, it was an honor to be in the same room with some of them."

It was after one of those lectures that Feldman began discussing with Department Chair Peter Carr how he could contribute to FRE's efforts, and that quickly led to an offer to teach, especially because Feldman's work has been focused for many years on the combination of quantitative analysis and data science best practices. "My course will give students a good idea of what the workday is like as a financial software programmer and all the basic tools to decide if they want to pursue the possibility further," he says. "I've hired a few Tandon students to be part of my team in the past and been very

impressed with both their technological and business-related ability. I'm looking forward to teaching talented students of that same caliber."



Michael Lipkin

(left, pictured next to his father, George, who recently retired from NYU Langone).

Michael Lipkin holds degrees in mathematics and chemistry, and his post-doctoral work concerned the physics of micro-emulsions, Ising models, and the theory of liquids. None of those studies, however, have been as valuable to him as a finance professional as his skill at the game of bridge. "Think of what happens on a trading floor," he explains. "You've got to make quick decisions because time is your enemy. Do you bid? Do you trade? And you have to consider all that without getting overwhelmed or letting your emotions get the better of you." Lipkin (left, pictured next to his father, George, who recently retired from NYU Langone) says that the best traders he has ever known have been good bridge players, and the profession has its share of high-level chess players, backgammon experts, and Scrabble champions as well. "But show me someone who gets too flustered to make a move or who simply doesn't enjoy the strategy that goes into gaming, and I'll show you someone who will probably not be a successful trader."



Lipkin's area of expertise — and the topic of his course — is the field of event-driven finance. It involves the pricing of securities attendant to take-overs, drug and earnings announcements, a change of interest rates by the Fed, and even such unexpected occurrences as the sudden death of a company's CEO.

He's equally comfortable trading, analyzing risk portfolios involving options, and working on derivatives strategies, but at one time, he envisioned remaining happily ensconced in academia. After having earned his Ph.D. at the University of Chicago in 1984, he conducted his post-doctoral research at Cornell and then parlayed that into a post as a physics instructor. "It didn't involve research, but it was a lot of fun, and Ithaca was beautiful," he recalls. "But then the Reagan administration cut funding for science, and as a result there was no longer a job for me." It was then Lipkin realized that his time at the bridge table was pointing the way to a different — but equally fun — career.

Now, he has the best of multiple worlds: he works as a professional bridge teacher and player (albeit not one of the top in the country, he admits); does research on topics of interest to him (he has published several scholarly papers with Marco Avellaneda, a mathematician from Courant); and is regularly back in the classroom, teaching a course he co-developed, just as he envisioned years ago. You might even say he's been dealt a great hand.



Sateesh Mane

The first piece of knowledge that a student might glean in Sateesh Mane's financial software lab course is not to jump to conclusions. For one thing, his name is not pronounced as one syllable, with a long "a" sound, as you might expect. It is, instead, pronounced mah-NAY, as though

there were an accent mark over the "e." Furthermore, even if you recognized the correct pronunciation — common in Indian names — and thus assumed he hailed from India, you'd still be incorrect. Mane was actually born in Malaysia (albeit to Indian parents who had immigrated there during British rule).

Mane arrived in the U.S. in 1981, after earning an undergraduate degree in physics from Cambridge University, and in 1987 he earned his doctoral degree in the same discipline from Cornell. His time there overlapped with that of Department Chair Peter Carr, who was teaching finance courses, but their paths did not cross at that point because Mane had little interest in that topic. He was set upon forging a career in academia, picturing himself conducting research and teaching physics somewhere. To that end, he embarked on post-doctoral studies at the Fermi National Accelerator Lab and Brookhaven National Lab, the latter located on Long Island, which he remembered flying over as his plane began its descent when he first arrived in New York.

By the late 1980s and early 1990s, however, increasing numbers of mathematicians and physicists were flocking to Wall Street and other world financial capitals, finding themselves in demand in that sector. Mane realized he could parlay his skills in a fintech job, provided he pivot his mindset: this was an industry interested not in theoretical research but in real-world applications.

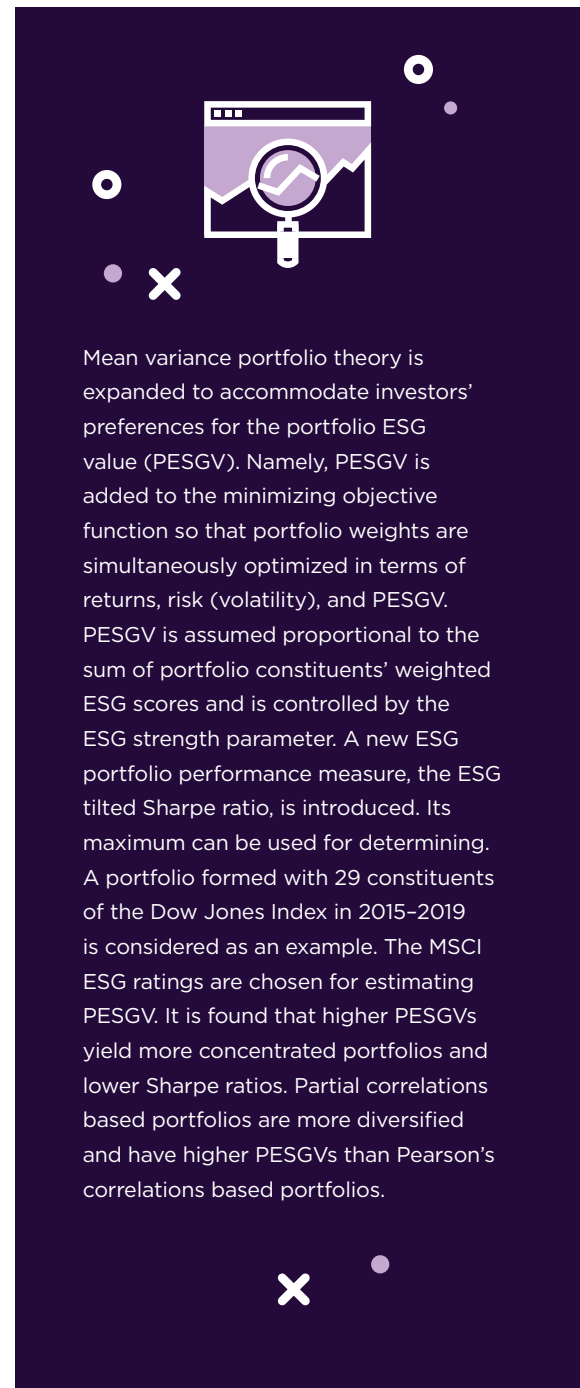
Students will thus leave his class with that ability to tackle practical, real-world problems. "If I give them an assignment or project, it will be drawn from my own experience in the industry," he explains. "I don't want them to merely do exercises from a textbook."

Mane — who has designed and created proprietary financial software libraries for firms ranging from small start-ups to multinationals like Morgan Stanley (where he did actually get to know Carr) — also wants to imbue his students with the confidence to leverage their own talents in a variety of settings. "In my case I was doing computational physics," he says, "and I put those skills to work in the financial world. If you know a technique, you can apply it anywhere."



Anatoly Schmidt

Last spring, Anatoly Schmidt's recently published paper "Optimal ESG portfolios: An Example for the Dow Jones Index," appeared in the *Journal of Sustainable Finance and Investment*.



Mean variance portfolio theory is expanded to accommodate investors' preferences for the portfolio ESG value (PESGV). Namely, PESGV is added to the minimizing objective function so that portfolio weights are simultaneously optimized in terms of returns, risk (volatility), and PESGV. PESGV is assumed proportional to the sum of portfolio constituents' weighted ESG scores and is controlled by the ESG strength parameter. A new ESG portfolio performance measure, the ESG tilted Sharpe ratio, is introduced. Its maximum can be used for determining. A portfolio formed with 29 constituents of the Dow Jones Index in 2015–2019 is considered as an example. The MSCI ESG ratings are chosen for estimating PESGV. It is found that higher PESGVs yield more concentrated portfolios and lower Sharpe ratios. Partial correlations based portfolios are more diversified and have higher PESGVs than Pearson's correlations based portfolios.



FRE Commencement Award Honorees - May 2020

Each year we are proud to recognize graduating seniors who have demonstrated outstanding achievement within the department.

This year's winners are:

Siqi Cao

John Patrick Sapit

Liqin Guan

Zixuan Huang

Rupal Jain

Yuxing Liang

Jiada Lu

Wenyun Qin

Chon Ip Sio

Ruichen Wang

Jieqi Xue

Jingzhe Yu

In addition, the following graduating seniors received the Superior Leadership and Service Awards, honoring their contributions to the FRE community.

Shreya Gossain

Jia Ju

Jiewen Li

Chon Ip Sio

Laukik Tated

Please join us in congratulating these well-deserved award recipients.

Bulls & Bears Update

The Bulls & Bears Club was founded to spark community engagement and create a tighter knit cohort within NYU's FRE program. The club strives to supplement theoretical FRE coursework with the soft-skills and financial intuition necessary to exceed employer expectations.

Bulls & Bears has adapted to the pandemic by continuing its operations online, meeting via Zoom and arranging virtual events with financial industry leaders.

CLUB LEADERS INCLUDE:

Steven Xu (President)

Supavitch Nakburee

Sachin Labhishetty

Kim Zhang

Henry Huang

Ajay Dugar



NYU Donations

To make a one-time donation or recurring gift in honor or memory of someone, please use this [NYU Donation Link](#).

To make a gift by phone to the Office of Gift Administration at NYU, please call **1-800-698-4144**, Monday - Friday between 9:00 AM and 5:00 PM EST. Thank you for your support and generosity.

Great Hires

Fall 2020 recruitment is off to a great start. Many firms have been actively recruiting our talented students for both internship and full-time roles. Employer recruitment sessions are held via Zoom, allowing students and employers to come together at mutually convenient times.

In addition to the recruitment events, FRE students have also participated in professional development sessions such as "Tackling Behavioral Interviews" and "Refining your Pitch," which were led by interim career placement director, Tamar Hofer. FRE alumni will be hosting the very popular "Job Spotlight Series" and "Alumni Mock Interviews" in October and November.





Socially Distanced, but Always Connected

From the inception of the COVID-19 crisis, the FRE staff has remained in contact with one another. Our weekly staff meetings are now held via Zoom but business continues as usual. These meetings kept us all connected during a time when life seemed to unravel and prove you can't keep the FRE family down.

On April 6, 2020, Department Chair Peter Carr and his team hosted a “Chat and Chew” session that invited faculty, FRE students, and the incoming Fall 2020 cohort to meet via Zoom to discuss course options, upcoming talks, and insights into the financial engineering industry. The staff

was also on hand to discuss their specific roles and responsibilities within the department.

On September 3, 2020, students in the entering fall 2020 cohort of the NYU Tandon MSFE program joined the first Peer Recruiting Advice Session of the academic year, via Zoom. Second-year panelists Camilla Zhang, Sabrina Wei, Nora Xu, and Jinyang Li (pictured below) shared their insights on making industry connections, nailing the interview, and everything in between. The FRE Career Team looks forward to many productive and interactive workshops ahead this year!

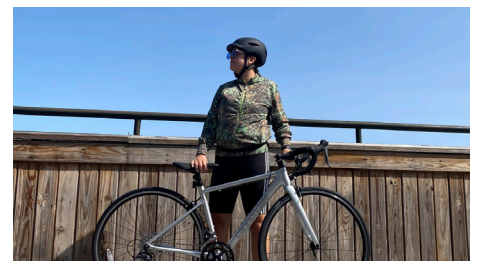
Keeping Fit with the FRE Staff



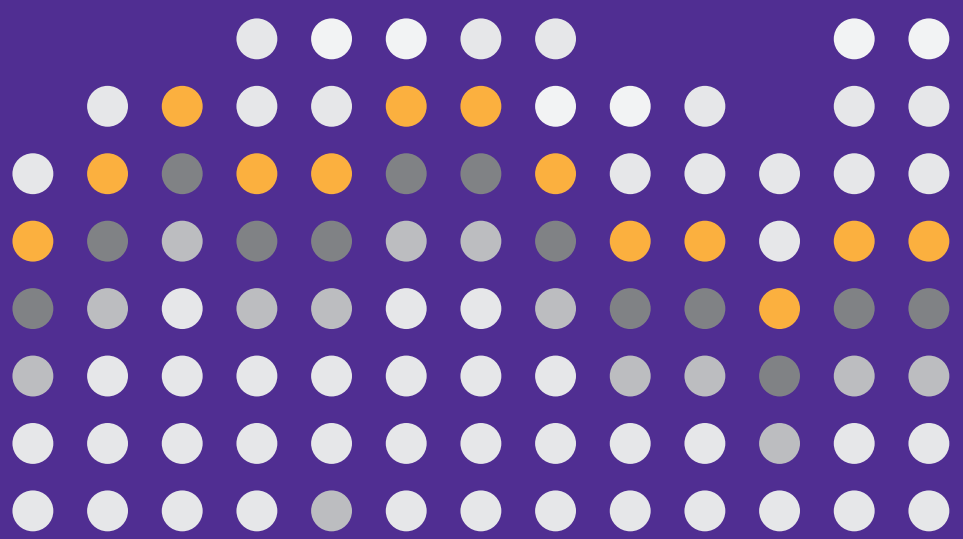
FRE Program Manager Jonnett Romano organized a 25-mile bike ride on July 15th. Joining Jonnett on the ride were FE students Titash Ghoshal and Ji Wu. The trio began in Sunset Park and then rode through Red Hook, Dumbo, Williamsburg, and Greenpoint, crossing the Brooklyn Bridge to end up in lower Manhattan.



When Assistant Manager of Communications Jennifer Novicki is not sending out communications or keeping the FRE website up to date, she bike rides 15-20 miles a day. She loves riding for both the physical and the mental health benefits. Jen's favorite destination is Liberty State Park in Jersey City.



Peter Carr and his wife, Carol, are also keeping fit, and over the summer they rode bikes to Nick's Lobster House in Marine Park, Brooklyn, from their home in Carroll Gardens—almost 19 miles each way. The couple was too busy pedaling to stop for a photo op.



DID YOU KNOW?

It's Time to Paws - Meet the Staff and Faculty Pets:



Peter Carr's cats:

Mick (named after Mick Jagger)

Mack (named after Fleetwood Mac)



Barry Blecherman's dogs:

Lola (left) and Johnny (lounging)



James Tien's cats:

Dawn (waiting for affection)

Salem (watching every move!)



Zahra Patterson's cat:

Rocky (a true fighter)



Jennifer Novicki's cats:

Earl (black cat) and Kookie (calico)

New Addition to the FRE Family

One bright light in the shadows of a global pandemic was the exciting new addition to the FRE family. Please join us in congratulating Career Placement Director Sara DeLusant and her husband, who welcomed a baby girl, Mila Grace, on September 25, 2020. Mila was born at 1:28 PM, weighing in at 7lbs, 14ozs and 20 inches long. The family members are all doing well and Mila's parents are smitten with their new baby girl. Sara is expected back at NYU Tandon early next year.

While Sara is on maternity leave, Tamar Hofer, right, joins FRE this fall as the Interim Career Placement Director. Tamar is a Career and Organizational Development Consultant who has served as the Director of Career Placement for Columbia University's MSFE program and taught all Columbia Engineering graduate students in the Professional Development and Leadership program. She earned an M.A. from Teachers College, Columbia University, and a Ph.D. in Organizational Psychology from Hofstra University.

We welcome Tamar to the FRE team!





Brooklyn Quant Experience

LECTURE SERIES

Fall 2020 Brooklyn Quant Experience

Our lecture series was renamed last spring to “BQE,” but the same great mix of industry professionals and academic stars. All lectures were held on Thursdays, from 6 to 7 pm at the location indicated. After March 5th, all lectures were given via Zoom. The Fall 2020 BQE lectures will all be held via Zoom.

SEPTEMBER 10

Alexander Antonov,
Chief Analyst, Danske Bank
Quantifying Model Performance

SEPTEMBER 17

Jon Hill,
NYU Tandon FRE Adjunct Professor
A Smarter Model Risk Management Discipline Will Follow From Making Smarter Models

SEPTEMBER 24

Steven Heston,
Professor of Finance
University of Maryland, College Park
Option Momentum

OCTOBER 1

Pasquale Cirillo,
Delft University of Technology
From P to Q and Beyond, a Tale of Inequality

OCTOBER 8

Conall O’Sullivan,
Asst. Professor of Finance,
University of Dublin
Option-Implied Quantiles and Market Returns

OCTOBER 22

Bruno Kamden,
Professorial Lecturer
The George Washington University
Optimal Strategies for Oil Production and Taxation Under Cap-and-Trade

OCTOBER 29

Peter Carr,
NYU Tandon, FRE Department Chair
Simple Bermudan Option Pricing

NOVEMBER 5

Sanjay K. Nawalkhai,
Professor of Finance,
University of Massachusetts
TBA.

NOVEMBER 12

David Shimko,
NYU Tandon, Industry Full-Professor
Valuation of Contingent Corporate Claims

NOVEMBER 19

Oleg Bondarenko,
Professor,
University of Illinois at Chicago
Option-Implied Dependence and Correlation Risk Premium.

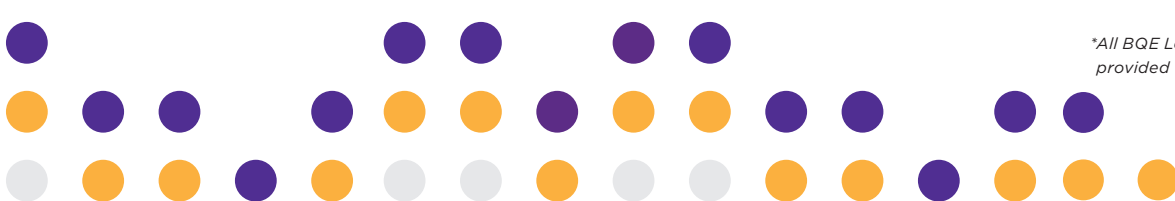
DECEMBER 3

Ting Kam Leonard Wong,
Asst. Professor, University of Toronto
TBA.

DECEMBER 10

Michael Konikov,
Senior VP and Head of Quantitative Development Numerix
A New Arbitrage-Free Parametric Volatility Surface

*All BQE Lectures are held via Zoom and links are provided weekly. Lecture titles TBA.



Department of Finance and Risk Engineering
1 Metrotech Center
Brooklyn, NY 11201



Comments or Questions?

engineering.fre@nyu.edu
or 646-997-3279

engineering.nyu.edu #NYUTandonMade

ABOUT Catching FIRE

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