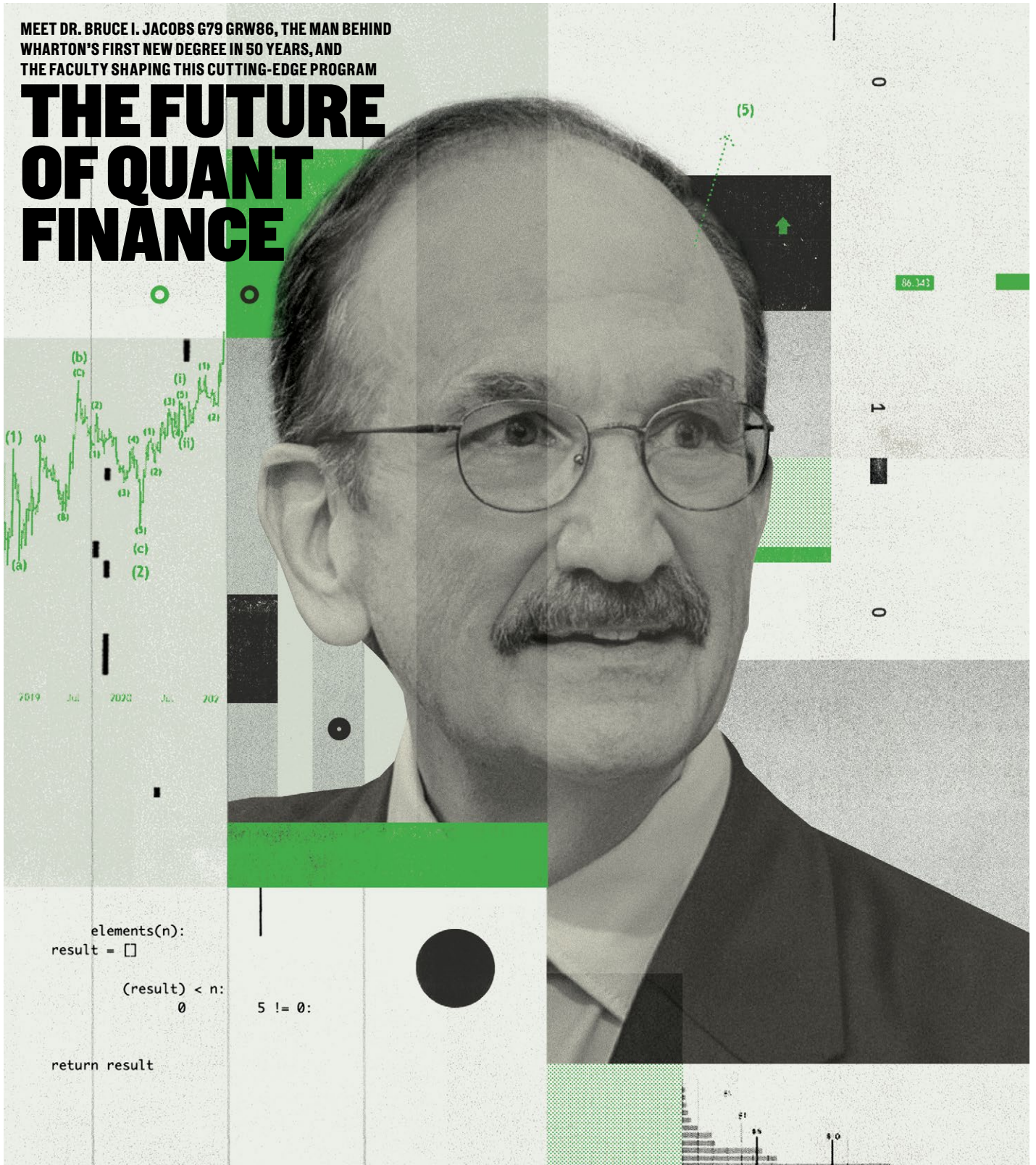


MEET DR. BRUCE I. JACOBS G79 GRW86, THE MAN BEHIND WHARTON'S FIRST NEW DEGREE IN 50 YEARS, AND THE FACULTY SHAPING THIS CUTTING-EDGE PROGRAM

THE FUTURE OF QUANT FINANCE



Contents

WHARTON MAGAZINE

Spring/Summer 2026

64

FEATURE
Building the
Future of
Quantitative
Finance



Nikolai Roussanov, Dr. Bruce I. Jacobs
G79 GRW86, and Jessica Wachter

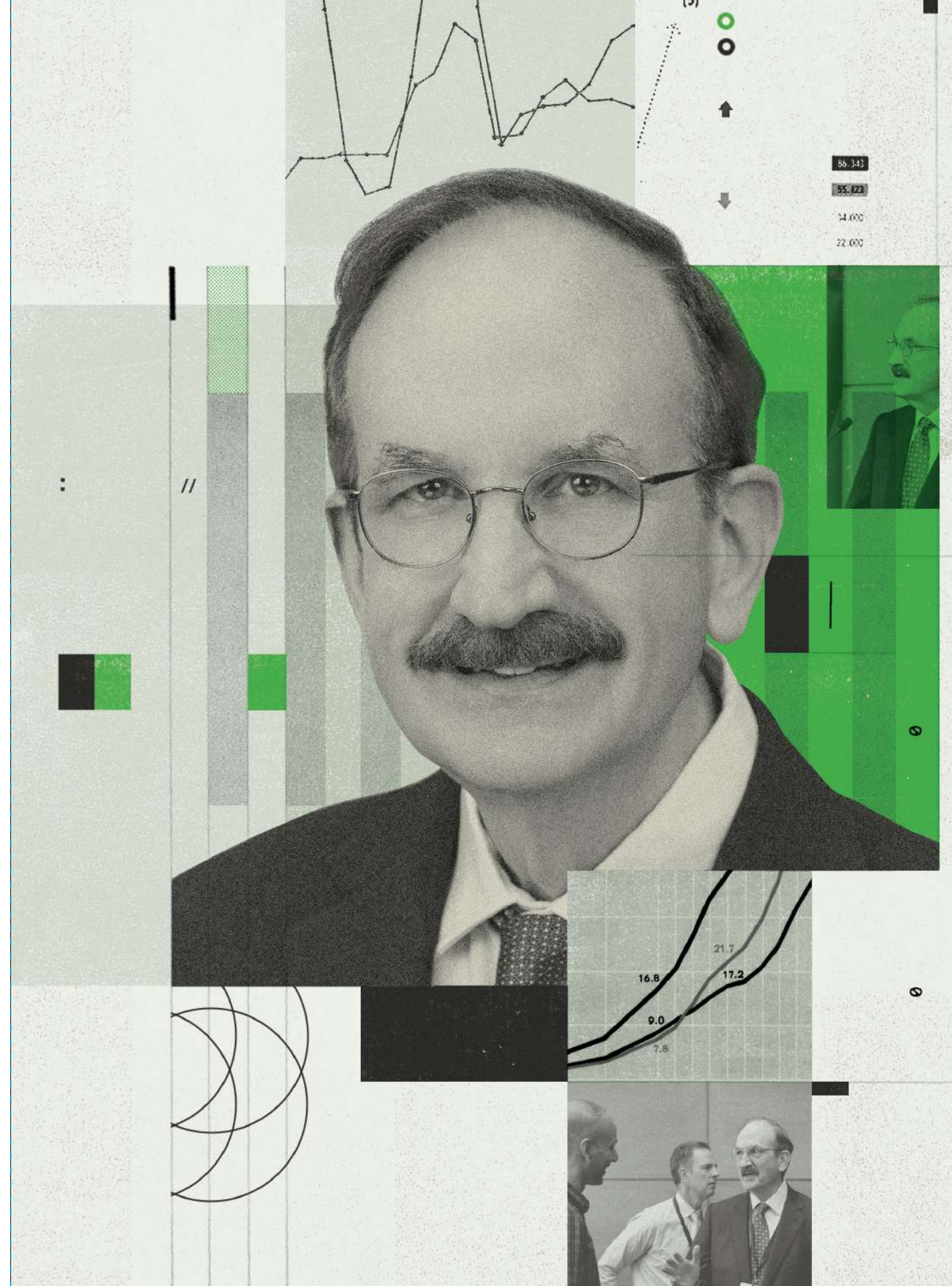
COVER:
Dr. Bruce I. Jacobs
G79 GRW86

Wharton Magazine
VOL. 32 EDITION 1
Wharton Magazine is published
semi-annually by Wharton
External Affairs.

BUILDING THE FUTURE OF Quantitative Finance

With the announcement last fall of a transformational \$60 million gift to establish Wharton's first new degree in 50 years, **Dr. Bruce I. Jacobs G79 GRW86** continues a legacy of supporting the School's position at the forefront of finance education. Here, meet the man behind the mission to inspire a new generation of quants, learn from professors shaping the master's program, and hear from alumni who credit Wharton and Jacobs for their successful careers in the field.

ILLUSTRATIONS BY MIKE MCQUADE



A CLASS OF HIS OWN

From a childhood interest in stocks to an innovative career in finance and a historic impact on Wharton, Dr. Bruce I. Jacobs G79 GRW86 continues to blaze trails and prepare young talent for the future of quantitative finance.

BY CIARAN BELLWOAR

At the core of Jacobs Levy Equity Management's office sits a spacious "Thought Leadership" alcove, off an expansive open-floor workspace that fosters collaboration among 70 team members. The firm manages \$25 billion in assets from institutional investors, with groups engaged in research, portfolio engineering, trading, and client service. The alcove's walls are lined floor-to-ceiling with more than a hundred publications, including 70 peer-reviewed published articles, several of which are award-winning; many articles translated into Chinese and Japanese; co-edited financial journal issues; 20 chapters in investment volumes; and 10 authored and edited books. The collection, representing four decades of research and innovation, serves as both an archival resource and a testament to the persistence, perseverance, and disciplined conviction that Dr. Bruce I. Jacobs brings to his intellectual and professional pursuits.

During my recent visit to the northern New Jersey headquarters, Jacobs reflected on a journey that began with an early fascination with stock-price fluctuations and evolved into a body of work that has continually expanded the frontiers of quantitative finance. Seated in a large conference room, Jacobs spoke with a hint of nostalgia about formative milestones, the disciplined inquiry behind his research, and the pride he takes in advancing the field through practice, teaching, and philanthropy.

Long before quantitative finance became an established discipline, Jacobs was experimenting. As a teenager growing up in South Orange, New Jersey, he tracked stocks that mutual funds were buying and selling and persuaded his parents to let him open a brokerage account to test his approach. He purchased two shares each of several companies, diversifying before he fully understood the theory behind it. "I didn't realize that this early interest would later converge with my studies and lead to a career," he recalls.

Jacobs hopes the Wharton School will serve as a global destination for quantitative thinkers—a place where rigorous inquiry and practical application remain inseparable. "It's inspirational to see students becoming passionate about the field," he says. "That's how the discipline continues to grow."



JACOBS MSQF FACULTY
DIRECTOR DAVID MUSTO,
BRUCE JACOBS, AND
DEAN ERIKA JAMES

A proud product of the public school system, Jacobs formalized his path as he immersed himself in higher education. An undergraduate degree from Columbia College led to a master's in operations research at the Columbia School of Engineering. Eager to understand how to apply the technical skills he had developed, he pursued a master's in business at Carnegie Mellon University's Graduate School of Industrial Administration. While Jacobs valued the full range of business disciplines, he found himself increasingly drawn to finance, captivated by its complexities over time and uncertainty. The study of capital markets was becoming central to his interests and would shape his next step: graduate study at the Wharton School.

"I earned a master's and PhD in finance at Wharton and had the opportunity to teach finance to MBAs, undergraduates, and Executive MBA students," Jacobs recalls. "I discovered my love of teaching."

While at Wharton, Jacobs met a kindred spirit in fellow doctoral student Kenneth N. Levy WG76 G82. The two shared a deep interest in quantitative finance and a skepticism of the prevailing belief that markets are always efficient. That intellectual alignment formed the foundation of a partnership that has endured for decades. After early roles at Prudential Asset Management Company—one of the few institutions at the time willing to hire quantitative analysts—they founded Jacobs Levy Equity Management in 1986.

Launching the firm required patience and vision. For the first three years, the two lived off savings while refining their models, testing assumptions, and building the systems they believed would endure. Their early work would later draw institutional investors from around the world, but at the outset, the priority was focusing on research. "We did nothing but research and build our investment systems," Jacobs says. "We were very motivated to succeed." It was a path that would shape not only the firm's trajectory, but Jacobs's broader commitment to strengthening quantitative finance as a discipline.

The culture that emerged from those early years is reflected in the dedication of the firm's staff, many of whom have remained for decades. One of the first hires 35 years ago rose to head trader. Jacobs is known to be quick to credit colleagues for their contributions and generous in praise, yet unafraid to challenge prevailing ideas.

The duo's breakthrough came with a 1988 article in the *Financial Analysts Journal*, "Disentangling Equity Return Regularities: New Insights and Investment Opportunities." Rather than examine one or two factors, Jacobs and Levy modeled 25 simultaneously, seeking to isolate which ones truly mattered. The article won a Graham & Dodd Award and was later recognized as one of the 25 most influential articles in the journal's 80-year history.

Innovation, however, was never pursued without scrutiny. Earlier in his career at Prudential Asset Management, Jacobs analyzed "portfolio insurance" strategies that promised downside protection by mimicking put options through trend-following trading. He warned that if widely adopted, such strategies could destabilize markets. The crash of October 19, 1987, validated those concerns.

The episode reinforced a question that has guided much of his work: Beyond understanding how a model performs under ideal conditions, what assumptions may fail, and what risks remain unaccounted for? "I have written extensively about products and strategies that claim to reduce investment risk, as in my book *Too Smart for Our Own Good*," Jacobs says. "All too often, these products create an illusion of safety."

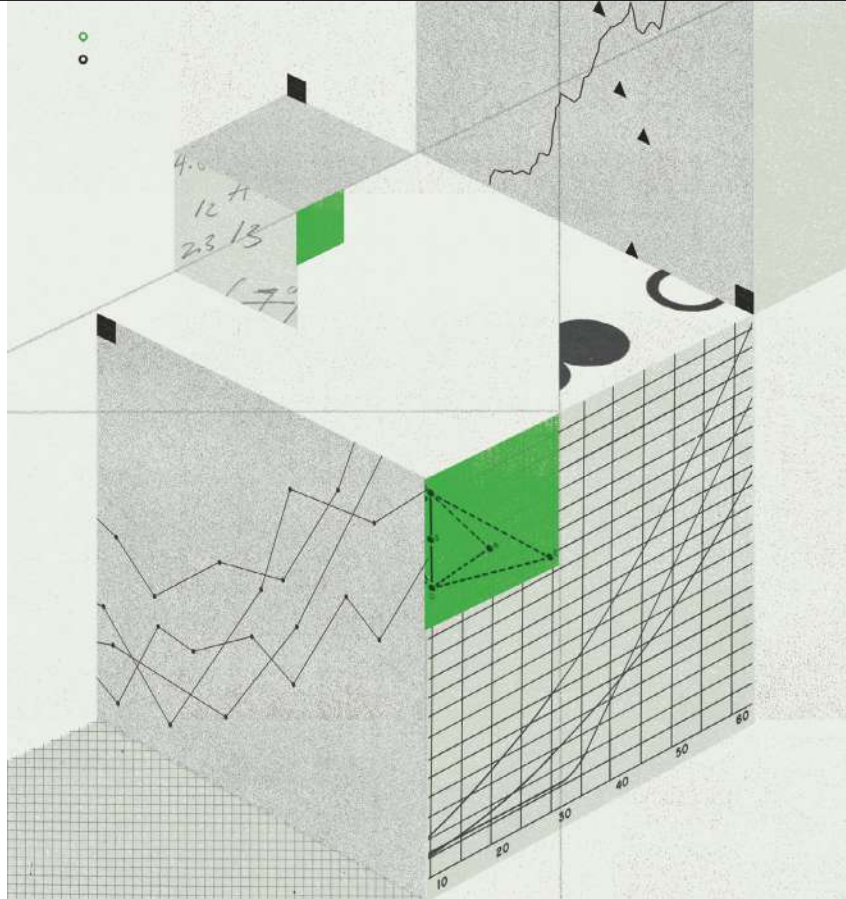
That instinct—to test ideas not only in theory but in practice and at scale—became a defining feature of his work. Over the decades, Jacobs's research contributions have shaped how quantitative investment management is practiced, spanning asset pricing, risk management, and performance evaluation. In the mid-1980s, systematic quantitative approaches were rare. Today, he notes, nearly all investors rely on some form of quantitative tools.

Even as the field has matured, Jacobs has continued to explore new approaches. His work on long-short portfolios led to the introduction of 130-30 strategies, which expanded how managers could express conviction while maintaining market exposure.

He and Levy later collaborated with Nobel laureate Harry Markowitz on portfolio optimization that included short positions and together coded a financial market simulator. Independently, Jacobs and Levy extended Modern Portfolio Theory to account for the trade-offs among return, volatility, and leverage risk, which they wrote about in their article “The Unique Risks of Portfolio Leverage: Why Modern Portfolio Theory Fails and How to Fix It.”

For Jacobs, research, teaching, and investing have never been separate pursuits. Proprietary research is continual, he notes, including building models based on artificial intelligence. With clients, there’s an ongoing exchange of ideas. That philosophy—rigorous inquiry coupled with practical application and accountability—gradually extended beyond the firm’s walls and into the institutions shaping the field’s future.

Over the past 15 years, Jacobs’s commitment to Wharton has taken form through a series of carefully considered investments. He and Levy established the Jacobs Levy Equity Management Center for Quantitative Financial Research, creating a home for faculty scholarship and doctoral research in the field. They launched the Wharton-Jacobs Levy Prize for Quantitative Financial Innovation, recognizing ideas that advance investment practice, as well as the Jacobs Levy Equity Management Dissertation Fellowships in Quantitative Finance. Jacobs has further strengthened the academic pipeline with a quantitative finance major in the MBA program, providing funding for the Dr. Bruce I. Jacobs Professorship in Quantitative Finance and the Dr. Bruce I. Jacobs Scholars in Quantitative Finance.



Each initiative, whether his own or in partnership with Levy, has been meaningful in its own right, contributing to a sustained effort to build the intellectual scaffolding supporting quantitative finance at Wharton. “Ken and I enjoy contributing new ideas and strategy innovations to the literature to benefit this and future generations,” Jacobs says. “We want to encourage others to do the same. This builds up the body of knowledge in the field.”

The spirit behind his giving extends beyond Wharton, reaching into health care, community initiatives, and the arts—institutions that, like universities, depend on sustained stewardship and thoughtful investment. But the through line is consistent. Philanthropy, in Jacobs’s view, is a form of service—an opportunity to strengthen institutions and expand access to beneficial services.

The establishment of the Dr. Bruce I. Jacobs Master of Science in Quantitative Finance (Jacobs MSQF) and the Dr. Bruce I. Jacobs Master of Science in Quantitative Finance Fellows last fall marks the next chapter in that progression. It’s a historic moment, marking both the largest gift in Wharton’s history and the School’s first new degree program in 50 years. But more than a milestone, the Jacobs MSQF represents a long-standing commitment brought into sharper institutional focus: positioning Wharton as a magnet for quantitative talent and ensuring that disciplined scholarship continues to translate into meaningful practice.

“There was an increase in computational power, which allows you to do a lot more analysis and do more sophisticated things,” **finance department chair Itay Goldstein says of the quant field’s evolution.**

“There has been an increase in the availability of data and a lot more dimensions in which you can build a trading strategy or portfolio allocations.”

The one-year Jacobs MSQF program offers an accelerated, technically rigorous path to graduate study in quantitative finance, equipping students with advanced training in quantitative methods, machine learning, artificial intelligence, and financial markets. In addition to coursework, students undertake a hands-on research project addressing a real-world challenge faced by asset managers and have opportunities for industry internships. Jacobs hopes Wharton will serve as a global destination for quantitative thinkers—a place where rigorous inquiry and practical application remain inseparable.

For Jacobs, generosity extends beyond the gift; sustained engagement is an essential part of the commitment. He remains closely involved—chairing the board of the Jacobs Levy Equity Management Center for Quantitative Financial Research, meeting annually with Jacobs Scholars, and serving as honorary chair of the Jacobs MSQF Advisory Board. “It’s inspirational to see students becoming passionate about the field,” he says. “That’s how the discipline continues to grow.” Wharton Dean Erika James puts Jacobs’s legacy, at the School and across his industry, in full context: “We are immensely grateful to Bruce for his enduring support of quantitative finance research and educational opportunities at Wharton,” she says. “His intellectual contributions to the field and impact on our students and scholars have been nothing short of game-changing.”

When it comes to Wharton, Jacobs expresses pride and a sense of responsibility. “The Wharton School is globally recognized for its outstanding faculty, students, and innovative leadership,” he says. “I feel an obligation to ensure that future generations of Wharton students will have even greater opportunities to make an impact on the field of quantitative finance.”

BUILDING A PROGRAM FOR THE DATA-DRIVEN ERA

Wharton faculty share perspectives on the value of quant finance education and the exciting vision for the Jacobs MSQF.

BY JASON MCCUE

Quantitative methods shape the financial landscape in the 21st century. Deep within the numbers, stories are unfolding—and those stories quietly guide how practitioners think about alpha, risk, and asset management. The ability to analyze the growing body of financial data has become imperative for future financial leaders, and the Wharton School’s finance department is answering the call to teach these skills with a new degree program focused solely on quantitative finance: the Dr. Bruce I. Jacobs Master of Science in Quantitative Finance (Jacobs MSQF).

While the program itself is novel to the University of Pennsylvania, Wharton faculty have long been at the forefront of academic financial research. With a generous gift from Bruce I. Jacobs and Kenneth N. Levy, Wharton established the Jacobs Levy Equity Management Center for Quantitative Financial Research and the Wharton-Jacobs Levy Prize for Quantitative Financial Innovation in 2011 to advance quantitative finance at the intersection of theory and practice. The Center has since served as the School’s headquarters for disseminating the world’s most innovative quantitative findings. The Center, the Prize, and in 2020 the MBA major in quantitative finance, which is supported by gifts from Jacobs to establish the Dr. Bruce I. Jacobs Scholars in Quantitative Finance and the Dr. Bruce I. Jacobs Professorship in Quantitative Finance, have all contributed to the strong quantitative culture in the finance department.

All the while, Wharton faculty members have watched as new technologies continue to transform the field.

INCORPORATING BIG DATA MODELS INTO QUANT FINANCE

Quantitative finance relies on mathematical models and datasets to understand market trends, price securities, and evaluate risk. Nikolai Roussanov, the Moise Y. Safra Professor of Finance at Wharton and academic advisor for the MBA quantitative finance major, explains that quantitative finance uses “mathematical and statistical methods together with rich financial data to construct trading strategies, optimize portfolios, and control risk.” The applications can range from asset management to corporate finance, along with more big-picture wealth management strategies and asset allocation.

The scope of quantitative finance has evolved since its inception. In the 20th century, many “quants,” or quantitative finance professionals, were based in investment banks and hedge funds and employed heavily mathematical methods to conduct financial engineering. As the 21st century progressed, the field shifted from being primarily model-driven to incorporating a broader ecosystem that combines theory, computation, and large-scale empirical analysis.

“It’s not that models are less important. Different tasks and problems call for different tools and methods,” Roussanov elaborates. “Rather, it’s very empirical. We’re using data to understand the behavior of asset prices.” Today’s leading quantitative finance firms represent the use of empirical analysis in practice.

The emphasis on data analysis in quantitative finance is driven by new technology. Itay Goldstein, Joel S. Ehrenkranz Family Professor and chairperson of Wharton’s finance department, reflects on the changes he’s witnessed in the field over his academic career.

“There was an increase in computational power, which allows you to do a lot more analysis and do more sophisticated things,” he says. “There has been an increase in the availability of data and a lot more dimensions in which you can build a trading strategy or portfolio allocations.”

The advent of artificial intelligence marks a major advancement, Goldstein says: “We always talk about the introduction of AI, which uses even more sophisticated methods to find patterns in the data and even introduces machines that are learning by themselves and coming up with these new avenues by themselves without getting instructions from humans.”

Faculty research has been at the forefront of showing how artificial intelligence is transforming finance—and the risks embedded in that transformation. This faculty expertise sets the stage for Wharton’s newest degree program.

HOW THE JACOBS MSQF MEETS THE MOMENT OF QUANT FINANCE

The Jacobs MSQF will bring students right to the technological frontier of Wharton faculty’s unmatched expertise in quantitative methods, machine learning, artificial intelligence, and financial markets.

David Musto, the Ronald O. Perelman Professor in Finance, was recently named faculty director of the Jacobs MSQF program. To understand how innovative this master’s program is, he explains, all one needs to do is look at what’s being added to the curriculum.

Musto is especially excited about the course in data science for finance. Although data science has been part of Wharton’s finance teachings, he explains, “It’s going to be adapted to the latest in AI, to bring it up to the cutting edge of quantitative techniques, fitting big models to the data to help pick up predictive patterns and manage money.”

This course will be taught by professor Winston Wei Dou, whose research with Goldstein on AI in finance has received acclaim for demonstrating the risk of AI-powered market manipulation through collusive trading, despite AI not being programmed for collusion.

Musto highlights another Jacobs MSQF course that will instruct students on the foundations of asset pricing. This course will be taught by Jessica Wachter, the Dr. Bruce I. Jacobs Professor in Quantitative Finance, who served as the chief economist and director of the Division of Economic and Risk Analysis at the U.S. Securities and Exchange Commission from 2021 to 2025. Musto sees this course as providing students with a doctoral-level understanding of asset pricing, which will help them build their own frameworks for pricing assets.

Wachter’s research recently made headlines after it revealed how investors systematically overreact to repetitive earnings news, then correct this overreaction in the months that follow. Those findings challenge widely held beliefs about market efficiency. Jacobs MSQF students won’t just learn about established frameworks; they’ll also engage with faculty who are actively redefining our understanding of markets.

“Quant has always been central to the culture of the finance department,” says program faculty director David Musto. “But now, with the Jacobs MSQF, we’ll be spreading and strengthening that culture among Wharton students and in the broader financial community.”



5
CLOCKWISE FROM TOP LEFT: PROFESSORS ITAY GOLDSTEIN, JESSICA WACHTER, WINSTON WEI DOU, AND NIKOLAI ROUSSANOV

Along with access to faculty experts, students will work directly with industry professionals from the Jacobs MSQF Advisory Board through the Applied Research Practicum. Musto explains that in this course, “The practitioner helps pose a question that the students work on—a sort of question you’d work on in the quant workplace.” The practicum will help bridge the gap between the theoretical training students receive in the classroom and the complexity that comes with real-world application.

SEIZING THE OPPORTUNITY TO BECOME FINANCE LEADERS

Advanced quantitative tools are reshaping the field, and Wharton is preparing its students to become leaders in this bold new future of finance. “This is a thriving industry,” says Goldstein. “There is a lot of opportunity for getting involved.”

Jacobs MSQF students will develop fluency with empirical tools. The quantitative finance field is becoming increasingly reliant on large datasets. The ability to mine useful information out of complex data represents the advantage Jacobs MSQF students will have upon entering the industry. “Empirical tools are key because we need to understand what data tells us,” Roussanov explains. “The bleeding edge of quantitative finance is understanding how these newfangled tools—in the previous decade, machine learning; now, it’s AI—are being increasingly used.”

Empirical skills are essential as discussion about AI's adoption ramps up in the finance community. "There's a lot of debate about the ability of AI to, in some sense, do a better job at prediction in a financial context," Roussanov says. "That's where a lot of academic research is focused, and these are the tools we want our students to be equipped with."

One of the most purposeful elements of the program's arrangement is its versatility. The framers of this degree wanted the material to remain relevant to developments in the business sector.

"Wherever the industry goes, we'll be right there with it," Musto emphasizes. The industry partners who make up the Jacobs MSQF Advisory Board are essential to this effort: "The board members are a window into the different cultures and different approaches of the companies they work for," Musto says.

The students comprising the program's first cohort will make history not only for Wharton, but also for the broader financial landscape. It's a pivotal moment made possible by Jacobs's vision and a devotion to quantitative finance inherent at Wharton. As Musto says, "Quant has always been central to the culture of the finance department, but now, with the Jacobs MSQF, we'll be spreading and strengthening that culture among Wharton students and in the broader financial community."

INSPIRING TOMORROW'S LEADERS

Established in 2020, Dr. Bruce I. Jacobs Scholars in Quantitative Finance is a competitive academic award for exceptional MBA students majoring in quant finance. Here, four Jacobs Scholars reflect on how Wharton prepared them for success in the field.

BY JOANNA BLAZ



Vineeth Ravi WG26
AI Investment Research Analyst Intern, FullerThaler

It's fitting that the most recent graduates of the quant finance major would be at the forefront of AI. Vineeth Ravi's aim as a Jacobs Scholar was to launch a career at the intersection of artificial intelligence and finance. As he prepares to graduate in May, he'll make that goal a reality.

In his new position at FullerThaler, Ravi plans to improve upon a large language model he built that can sort through the 3,000 or so companies that release quarterly earnings reports more quickly than it would take a human to go through five. He'll also combine data from sell-side reports with AI commentary to create forecasts about the company—for example, a target stock price. It's an opportunity that wouldn't be possible without the skills he learned through classes in valuation and investment management, he says.

Pursuing the quant finance major after working as an AI researcher at J.P. Morgan allowed for a lot of experimentation. "Wharton has been very AI-first across all the coursework I've seen," says Ravi, adding that professor Jules van Binsbergen encouraged students to see ChatGPT as a tool to use to perform their jobs much faster. Ravi's long-term ambition is to start his own firm and train AI agents to make quant-informed trades the way a human would, which would be "a dream come true."



Leonardo Cozzubo Gonçalves WG24
Solutions Portfolio Manager, Itaú Asset Management

With degrees in mechanical and aerospace engineering and a prior role as a data scientist, Leonardo Cozzubo Gonçalves wasn't sure what was next in his career when he arrived at Wharton. "I wanted to do something that would have analytics or data science as a requirement or a desired skill that I could use to try a new role in a new industry," he says. "Then I found out about the quantitative finance MBA major, and I quickly realized that's what I wanted to do."

Gonçalves was able to build on the background he already had in models, data science, and analytics and combine it with new techniques. The quant finance major also exposed him to different aspects of finance. Gonçalves landed at Itaú Asset Management, part of the largest privately owned bank in Latin America, as a portfolio manager, overseeing \$4 billion in funds and managed accounts.

"My career transition was enabled by this program," he says. "I wish more people would pursue this career path."

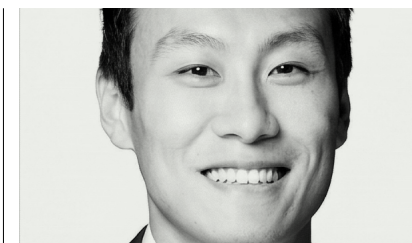


Yihan Xie WG22
Equity Analyst, T. Rowe Price

As a student in an early cohort of the major, Yihan Xie felt she was part of a special group. "Quant finance naturally attracted people who are interested into a small circle," she says. Xie arrived at Wharton with an information science background but knew classmates would come from various fields. "The hard skill set is very similar, because for info science, the training is a lot of math and coding," she says. "It's a natural foundation for us to pivot into quant." She found that the overlap with PhD, engineering, and statistics students created a robust mix of perspectives.

Today, a few years after earning her MBA, Xie says Wharton has remained a "center of gravity" grounding the Jacobs Scholars to the program—and to each other. Events such as the Jacobs Levy Equity Management Center's annual Frontiers in Quantitative Finance Conference help Xie stay connected and informed.

Xie is currently the sole quant MBA at T. Rowe Price's headquarters in Baltimore, but not for long. Another Jacobs Scholar, Max Kieff G14 W14 GEN26 WG26, will join this year. "The Jacobs Scholars program has done a great job selecting people," says Xie. "It's a bridge that opens a lot of opportunities."



Johnny (Anke) Wang WG23
Vice President/Portfolio Manager, PIMCO

Johnny Wang enjoyed the specialized courses he took as part of the major, from professor Brian Bushee's Financial Disclosure Analytics to professor Joao Gomes's Central Banks, Macroeconomic Policy, and Financial Markets. Today, he relies on concepts from his Wharton coursework almost daily.

"I do fixed-income investing, so my course in fixed-income was invaluable," says Wang, who is based in California with investment management firm PIMCO. "A lot of my work is trying to understand accounting concepts such as balance sheet health and company financials, and LTV [loan-to-value], especially in distressed situations."

Like many Jacobs Scholars, Wang accepted a full-time role at the same company he interned with during the program, thanks to a "robust" on-campus recruiting system. But building connections with those in his cohort, such as with Manraj Bevli WG23, personalized the experience and still resonates, says Wang: "The ability to keep in touch really motivated people." ●

"I wanted something that would have analytics or data science as a requirement or a desired skill that I could use to try a new role in a new industry," says Jacobs Scholar Leonardo Cozzubo Gonçalves WG24. "Then I found out about the quantitative finance MBA major, and I quickly realized that's what I wanted to do."

This article is provided for informational purposes only and does not constitute an offer, endorsement, or solicitation of investment advisory services of Jacobs Levy Equity Management or its employees, nor a recommendation to buy or sell any securities or financial instruments. The individuals referenced or quoted are Wharton faculty, administrators, and students. These individuals are not clients of the firm.