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February 11, 2026

Dear Committee,

I am writing to apply for the NBER Innovation Research Boot Camp in July 2026. I am a sixth-year Ph.D. student in financial economics at the Yale School of Management with an expected graduation in May 2026.

With ongoing research at the intersection of corporate innovation and behavioral finance, the boot camp is a great opportunity for me to gain broader exposure to the field of innovation and develop new research ideas in this area. I describe my research interests and motivation for the boot camp in detail in the essay attached.

I attended the NBER Entrepreneurship Boot Camp in 2022, but I will still greatly benefit from the innovation boot camp for three main reasons. First, my job market paper finds that the public market misreacts to patent issuance news and that this misreaction affects firms' future innovation directions. Innovation decisions in public firms were not the focus of the entrepreneurship boot camp. Second, I have several ongoing projects as part of my research agenda on how financial markets, both private and public, affect future innovation and patent-to-product decisions. Therefore, this boot camp can familiarize me with the existing literature on heterogeneous innovation decisions and help me establish my agenda. Finally, as a finance PhD student and an I3 Open Data Fellow for 2025, I am eager to learn about the innovation research community and contribute by providing a finance perspective and creating new open innovation data. The innovation boot camp is a crucial venue to gain familiarity with cutting-edge research and connect with colleagues, which I have not yet had much exposure to in my graduate studies and in the entrepreneurship boot camp.

I enclose with this application the following materials:

1. A current CV
2. A list of current and completed PhD courses
3. An essay describing my research and reasons for wanting to attend the boot camp

Moreover, you should be receiving a recommendation letter for me directly from Song Ma, Professor of Finance and Entrepreneurship at Yale School of Management (song.ma@yale.edu).

Thank you for your consideration.

Sincerely,
Tianshu Lyu



Tianshu Lyu

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EDUCATION

Yale School of Management — New Haven, CT
Ph.D. in Financial Economics — 2020 - 2026 (expected)

MIT Sloan School of Management — Cambridge, MA
Master of Finance — 2017 - 2018
Financial Engineering Concentration

New York University Shanghai — Shanghai, China
B.S. in Computer Science and Business & Finance Double Major — 2013 - 2017
magna cum laude, Honor in Business Major

RESEARCH INTERESTS

Behavioral Finance, Corporate Finance, Innovation, Entrepreneurship

JOB MARKET PAPER

Taking the Road Less Traveled? Market Misreaction and Firm Innovation Directions [Link]
(with Zunda Winston Xu)

Abstract: We show that investors misreact to technological innovations based on their novelty, and that these misreactions distort firms' subsequent innovation directions. First, using textual measures of novelty, we find that investors underreact to the issuance of novel innovations but overreact to non-novel ones. Novel patent issuance predicts lower risk and positive forecast errors, consistent with non-risk-based mispricing. A model where boundedly-rational investors are uncertain about the true novelty of a patent at issuance explains the empirical patterns well. Second, using sensational news as an exogenous shock to misreaction, we present causal evidence that, after disappointing returns to patent news, novel firms follow up less on current novel technologies, and shift future innovations from novelty-seeking to copycatting when exploring new areas. The findings highlight that investors' misreactions to patent novelty steer innovation away from higher-valued, groundbreaking research.

PUBLICATIONS

The Risk and Return of Impact Investing Funds [Link]
(with Jessica Jeffers and Kelly Posenau), 2024
Journal of Financial Economics 161, 103928

Abstract: We provide the first analysis of the risk exposure and risk-adjusted performance of impact investing funds, private market funds with dual financial and social goals. We introduce a dataset of impact fund cash flows and exploit distortions in VC performance measures to characterize risk profiles. Impact funds have a lower market β than comparable private market strategies. Accounting for β, impact funds underperform the public market, though not necessarily more so than comparable strategies. We consider alternative pricing models, accounting for sustainability and emerging markets risk. We show investors' wealth portfolios and taste change the perceived financial merit of impact investing.

WORKING PAPERS

Causal Inference in Financial Event Studies [Link]
(with Paul Goldsmith-Pinkham)

Abstract: Financial event studies, ubiquitous in finance research, typically use linear factor models with known factors to estimate abnormal returns and identify causal effects of information events. This paper demonstrates that when factor models are misspecified—an almost certain reality—traditional event study estimators produce inconsistent estimates of treatment effects. The bias is particularly severe during volatile periods, over long horizons, and when event timing correlates with market conditions. We derive precise conditions for identification and expressions for asymptotic bias. As an alternative, we propose synthetic control methods that construct replicating portfolios from control securities without imposing specific factor structures. Revisiting four empirical applications, we show that some established findings may reflect model misspecification rather than true treatment effects. While traditional methods remain reliable for short-horizon studies with random event timing, our results suggest caution when interpreting long-horizon or volatile-period event studies and highlight the importance of quasi-experimental designs when available.

When Lenders Meet Venture Capitalists: Relationships in Venture Debt [Link]
(with Xugan Chen)

Abstract: We study how relationships between lenders and venture capital (VC) investors shape venture debt deals and startups' post-deal outcomes. We develop a model that highlights two competing mechanisms of this relationship: an information channel in which lenders benefit from VC certification and a market power channel in which lenders extract rents through bargaining power. Using a comprehensive dataset on global venture debt, we test these channels at different stages of venture debt. At entry, the relationships mitigate asymmetric information and increase the likelihood of obtaining venture debt. In the investment stage, relationship lenders reduce hard restrictions while charging higher spreads. Post-deal, relationship-backed startups are more likely to secure subsequent VC funding and successful exits by reallocating innovation toward commercially salient and safer projects. Our findings highlight that VC-lender relationships alleviate information frictions and allow rent extraction, yet ultimately facilitate value creation in high-growth ventures.

Watchdog or Showdog? Spotlight Chasing in Antitrust Enforcement [Link]
(with Zunda Winston Xu)

Abstract: We study how an acquirer's public visibility affects antitrust enforcement in mergers and its real economic consequences. Using a novel dataset linking FTC and DOJ inspection outcomes to news coverage of merger parties, we exploit within-industry and within-firm variation in visibility under a common political environment. We find that a 10 percent increase in the acquirer's share of industry news coverage raises the likelihood of being flagged by 1.5 to 3 percent. We establish causality using geographical proximity to media outlets as an exogenous source of variation in news coverage. We interpret these results through a political-accountability framework: higher visibility raises the reputational stakes of enforcement, leading regulators to challenge more visible acquirers. Consistent with this accountability framework, the visibility gradient strengthens during congressional appropriations hearings and disappears in lame-duck periods. Finally, visibility-driven scrutiny has real effects: overlooked low-visibility deals gain market power, while flagged acquirers expand inefficiently and face a higher financial burden. Our results highlight how public salience distorts merger review and generates persistent post-merger inefficiencies.

Context Dependence in Managerial Expectations [Link]

Abstract: This paper examines the biases in managerial expectations as a function of firms' financial conditions. Using microdata from the Duke CFO Survey and

managerial guidance, I document pervasive overreaction to news across forecasts of firm profitability, operations, and financing decisions, and even the aggregate market returns. Forecast errors are predictable from past realizations, consistent with extrapolative belief formation. I demonstrate that these biases are context-dependent: overreaction is stronger among financially constrained firms. Using exogenous shocks to earnings and financial conditions, I show that constrained managers overreact more strongly to negative earnings news, while managers with improved financial conditions exhibit weaker overreaction to positive earnings news. Evidence from moderate earthquakes as exogenous emotional shocks supports an affect-based mechanism: negative emotions distort managerial expectations, and these expectations, in turn, influence managers' future investment decisions. Overall, the results uncover novel affect-driven channels through which managerial expectations amplify distortions in firm investment.

WORK IN PROGRESS

Private Equity and the Financing of Industrial Policy
(with Song Ma)

Associative Memory is Machine Learning
(with J. Leland Bybee)

Four (or More) Facts about Infrastructure Funds
(with Kelly Posenau)

From Patent to Product: Evidence of the Innovator's Dilemma in Incumbent Firms
(with Jiawen Wu and Zunda Winston Xu)

What Do Investors Overreact to? An Empirical Analysis of Long-Term Earnings Growth Forecast
Second-year paper

TEACHING EXPERIENCE

Asset Pricing Theory Fall 2025, Fall 2024, Fall 2023, Fall 2022
Teaching Assistant, Yale School of Management
Fall 2024 with Saman Majd & Jeffrey Rosenbluth, Fall 2025, Fall 2023 with Paul Fontanier, Fall 2022 with Stefano Giglio

Behavioral Finance Spring 2025, Spring 2024, Spring 2023, Spring 2022
Teaching Assistant, Yale School of Management
with Nicholas C. Barberis

Financial Instruments for Speculation and Hedging Fall 2022
Teaching Assistant, Yale School of Management
with Stefano Giglio

Financial Markets & Macroeconomic Policy Fall 2023, Fall 2021
Teaching Assistant, Yale School of Management
with Alp Simsek

Hedge Fund Strategies Spring 2025
Teaching Assistant, Yale School of Management
with Andrea Frazzini and Ronen Israel

Venture Capital & Private Equity Fall 2025, Fall 2024, Spring 2024, Spring 2023
Teaching Assistant, Yale School of Management
Co-designed the course as Research Assistant, 2022
with Song Ma

CONFERENCE PRESENTATIONS

2025 NBER I^3, FMA, SFA, SITE, NBER SI*, BEAM, SFS Cavalcade NA, EFA, MFA, AFA Regular Session
2024 FMA, WUSTL EGSC, NFA PhD Session, MFR Summer Session (Poster), ESSFM Evening Seminar*, USC Marshall PhD Conference
2022 5th Private Markets Research Conference; MFA*
2021 UN PRI Academic Network Conference; NBER Entrepreneurship Working Group*; PERC Symposium*; EUROFIDAI-ESSEC Paris December Finance Meeting*; Pre-WFA Early Career Women in Finance Conference*; Workshop on Entrepreneurial Finance and Innovation (WEFI)*; Southern California PE Conference*
2020 Chicago-Area Entrepreneurship Workshop*

*Including scheduled, * indicates presentation by coauthor*

PROFESSIONAL SERVICES

Referee: The Quarterly Journal of Finance
Conference Program Committee: SFA Annual Meeting (2025)

Discussions:
Index Investing and Sentiment Spillover
by Adem Atmaz and Zibo Zhou, SFA 2025
Learning from the Little Guy: Innovation Spillovers from Private to Public Firms
by Melissa Crumling and Tanja Kirmse, EFA 2025
Risk Exposures from Risk Disclosures: What They Said and How They Said It
by Rahul Mazumder, Seth Pruitt, and Landon Ross, MFA 2025

AWARDS, GRANTS & HONORS

Open Data Fellowship, Innovation Information Initiative (I^3)	2025
Semifinalist for Best Paper Award (Asset Pricing & Investments), FMA	2024
Best Paper Award, USC Marshall PhD Conference in Finance	2024
Yale SOM Broad Center Research Grant (with Song Ma)	2024
Yale Graduate Fellowship	2020-2025
MFin Excellence Award	2018
Honors in Business Major	2017
NYU Shanghai Excellent Graduate	2017

INVITED PARTICIPATIONS

MFR Summer Session for Young Scholars	2024
Summer School on Structural Estimation in Corporate Finance	2023
NBER Entrepreneurship Research Boot Camp	2022
NBER Behavioral Macroeconomics Research Boot Camp	2022
Yale Summer School in Behavioral Finance	2022

OTHER RESEARCH EXPERIENCE

Research Professional, Fama-Miller Center 2018 - 2020
University of Chicago Booth School of Business
PIs: Professors George M. Constantinides, Zhiguo He, Jessica S. Jeffers, Elisabeth Kempf, Stefan Nagel

NYU Shanghai Business Honors Program 2016 - 2017

NYU Stern School of Business
Advisor: Professor Jennifer N. Carpenter
Thesis: On Performance and Persistence of Mutual Funds in China

Research Assistant 2016 - 2017
New York University Shanghai
PI: Professor Yiqing Lü
Textual analysis of corporate 10-K filings

MSCI - MIT Sloan, Joint Finance Research Practicum, Boston, MA 2018
Constructed measures of factor crowding in systematic trading strategies

Accenture - MIT Sloan, Joint Analytics Lab, Cambridge, MA 2017
Performed sentiment analysis on earnings call transcripts

SKILLS & LANGUAGE

Certificates: CFA Level I (2017); Machine Learning at Stanford University (Coursera); Deep Learning Specification at deeplearning.ai (Coursera)
Language: Chinese (Native), English (Professional)

REFERENCES

Nicholas C. Barberis (Chair)
Stephen and Camille Schramm Professor of Finance
Yale School of Management
nick.barberis@yale.edu

Song Ma
Professor of Finance and Entrepreneurship
Yale School of Management
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Paul Goldsmith-Pinkham
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Kelly Shue
Amman Mineral Professor of Finance
Yale School of Management
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https://tianshulyu.com/

Completed PhD Courses	**Grade**

YALE UNIVERSITY[1]
Ph.D. in Financial Economics, expected May 2026

Spring 2024
- Corporate Finance (Song Ma, Kelly Shue) — H
- Finance of Information (Jonathan E. Ingersoll Jr.) — Audit

Spring 2023
- Financial Economics of Climate and Sustainability (Stefano Giglio) — H
- Advanced Macro II (Fabrizio Zilibotti, Marta Prato) — Audit
- Mathematical Economics II (Eduardo Davila) — Audit

Fall 2022
- Industrial Organization I (Philip Haile) — Audit
- Macro Finance (Alp Simsek) — Audit

Spring 2022
- Applied Empirical Methods (Paul Goldsmith-Pinkham) — H
- Financial Crisis (Gary Gorton) — H
- Household Finance (James Choi) — H
- General Economic Theory: Macroeconomics II (Giuseppe Moscarini) — Audit

Fall 2021
- Advanced Macro I (George-Marios Angeletos, Zhen Huo) — H
- General Economic Theory: Macroeconomics I (Zhen Huo, Michael Peters) — H
- Financial Econometrics (Bryan Kelly) — H
- International Finance (Costas Arkolakis, Ana Cecilia Fieler) — Audit

Spring 2021
- Behavioral Finance (Nicholas Barberis) — H
- Econometrics II (Timothy Armstrong) — H
- General Economic Theory: Microeconomics II (Johannes Horner, Ryota Iijima) — HP
- Natural Language Processing (Dragomir Radev) — Audit

Fall 2020
- Financial Economics I (Jonathan Ingersoll & Stefano Giglio) — H
- Econometrics I (Donald Andrews) — H
- General Economic Theory: Microeconomics I (Larry Samuelson, Johannes Horner) — HP

THE UNIVERSITY OF CHICAGO
- Theory of Income I (Fernando Alvarez) — B+
- Corporate Finance II (Amir Sufi) — Audit

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Master of Finance, June 2018
- Econometrics (Victor Chernozhukov) — A+

[1] Yale graduate school uses the following grading policy: H – Honors, HP – High Pass, P – Pass, F – Fail

Dear Committee,

I am a sixth-year Ph.D. student in Financial Economics at Yale School of Management, expected to graduate in May 2026. My research interests lie in innovation and behavioral finance. I am applying to the NBER Innovation Boot Camp as I am eager to develop a solid foundation in the economics of innovation for my own research. I am actively researching how financial market behavior interacts with corporate innovation decisions, and would greatly benefit from the program. Innovation is an exciting field with a rapidly growing body of research, and I believe the NBER boot camp is the best place to master this body of work. I am developing a research agenda that connects financial markets, product markets, and innovation decisions, expanding our understanding of financing innovation and shedding light on innovation policies.

In an ongoing project with Zunda Winston Xu, we document that public-market investors underreact to novel patents but overreact to trend-following innovations. We provide a behavioral explanation for this systematic misreaction to novelty. Bounded-rational investors are unsure about the patent's true novelty at issuance. Instead, they receive noisy, but unbiased, signals. This shrinks their posterior to an intermediate prior level, which generates such a misreaction. We emphasize the economic consequences of the misreaction in firms' future innovation decisions. We find that, following disappointing returns driven by mispricing, novel firms shift their innovation strategy from novelty-seeking to copy-catting. Therefore, this project highlights that mispricing of the private value of innovation has real impacts on future innovation directions by steering firms away from groundbreaking, higher-valued research.

For my future research plan, I am interested in innovation research in two main directions. First, I am writing a follow-up paper on the delayed investment in novel innovation. In particular, many breakthrough innovations were not developed by the original innovator when they first emerged. My job market paper argues that underreaction to novel patents could be one reason. To follow up, we plan to do a comprehensive analysis of different channels, especially by tying innovation to commercialization. For example, the firm may not want to follow up because there was insufficient consumer demand, or the new technology may disrupt its current products. To study this question, we compile a novel dataset of patent-to-product-level matches. I conducted this project as part of the 2025 Open Data Fellows of Innovation Information Initiative (I^3) and presented at the working group in December 2025. I aim to study this question by combining the patent-to-product data with product information from Nielsen and Consumer Reports.

Second, I plan to further explore the mechanisms by which financial markets can affect innovation, especially through the interplay between public and private markets. Public firms account for less than half of the patents issued in the U.S. (Kogan et al. (2017)) – the majority of innovations are developed in private firms. Therefore, it is crucial to study private-market innovations, e.g., how private equity funds value patents. I plan to define proxies for the value of private-firm innovation using patent assignments, merger prices, or financing-round valuations. The valuation of private-market innovations could raise many important questions. For example, how do PE funds value new technology? How are they different from the public market? Related to my current research, private investors' perceptions of novel technology may better predict VC boom-bust cycles and the technology lifecycle if innovation is a significant component of private-firm valuation. On the other hand, could the PE valuation of technology change the types of firms they invest in, thereby shifting the direction of innovation? Howell et al. (2020) suggest that VC firms are more willing to fund radical innovations, especially during booms. In the meantime, VC cycles are largely driven by fund managers' expectations about the public market. If startups are more likely to pursue radical innovations during booms, would the interplay between VC and public-market boom-bust cycles affect the innovation composition between private and public firms? Would it lead to changes in the types of innovation and influence growth?

Given my research agenda, the NBER Innovation Boot Camp is an excellent opportunity to learn about the field's cutting-edge research and to consider how finance can play a role beyond existing mechanisms. I also want to get involved in the innovation research community. The boot camp is an invaluable opportunity to interact with peers with similar research interests and to explore potential collaborations. I sincerely hope to participate in the workshop to learn more about the field and interact with active researchers in innovation.

References

Howell, S. T., J. Lerner, R. Nanda, and R. R. Townsend (2020). How resilient is venture-backed innovation? evidence from four decades of us patenting. Technical report, National Bureau of Economic Research.

Kogan, L., D. Papanikolaou, A. Seru, and N. Stoffman (2017). Technological innovation, resource allocation, and growth. *The Quarterly Journal of Economics 132*(2), 665–712.