Cover Letter

Contact Information

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Ph.D. Program Advisor (Letter writer):

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Research Interests: Corporate Finance, Behavioral Finance, Financial Intermediaries

Education

Yale University *New Haven, CT*
Ph.D. in Financial Economics 2018 - Present

Tsinghua University *Beijing, China*
B.A. in Economics; B.S. in Mathematics 2012 - 2016
- Graduation with Distinction (GPA: 93/100, 3.95/4.00, Top 2%)
- Exchange student at University of California, Berkeley in Fall 2014

Academic Appointments

University of California, Berkeley *Berkeley, CA*
Full-time Research Assistant for Professor Ulrike Malmendier 2016 - 2018

Working Papers

"Managerial Stress, Aging, and Death" (with Mark Borgschulte, Marius Guenzel, and Ulrike Malmendier)

Abstract: We show that increased job demands due to stricter monitoring and industry crises have significant adverse consequences for managers' long-term health. Using hand-collected data on the dates of birth and death for more than 1,600 CEOs of large, publicly listed U.S. firms, we estimate that CEOs' lifespan increases by around two years when insulated from market discipline via anti-takeover laws. CEOs also stay on the job longer, with no evidence of a compensating differential in the form of lower pay. We identify similar effects on longevity from exposure to industry-wide downturns during a CEO's tenure. Finally, we utilize machine-learning age-estimation methods to detect visible signs of aging in pictures of CEOs. We estimate that exposure to a distress shock during the Great Recession increases CEOs' apparent age by roughly one year over the next decade.

"End-of-day Trading via Banks" (with Jingxiong Hu and Jiaheng Yu)

Abstract: Investment banks like Goldman Sachs have started a "guaranteed close" business where investors looking to buy or sell shares of a certain stock can get a guarantee from the broker-dealer to honor their orders at the close price set on the primary exchange. Trading volume executed through this venue has been increasing rapidly, reaching about one-third of the volume in the close auction in 2018. Using the TAQ data from 2012 to 2018, we find that when the fraction of trades through "guaranteed close" increases, the informativeness of close price increases. We develop a model featuring the venue choice of different types of investors. A bank conducting "guaranteed close" business competes with the exchange on transaction fees, and gains profit from trading strategically utilizing the order flow information. Our model shows that the introduction of the bank as an alternative closing venue improves discovery at the market close by concentrating the price-relevant information into the exchange.

Teaching Experiences

Yale School of Management
Teaching Assistant:
Corporate Finance, MBA course by Professor Kelly Shue 2020 Spring
The Executive, EMBA course by Professor Alexander Zentefis 2020 Fall

Seminars & Conferences

2020 AFA Annual Meeting*, Yale SOM (×2), MFA Annual Meeting

2019 NBER Organizational Economics Fall Meeting*, USC Marshall FOM Conference*

2018 UC Berkeley-Stanford Joint Behavioral Economics Mini-Conference*, University of Bonn briq Workshop on Skills, Preferences, and Educational Inequality*

(Including scheduled, * by coauthor)

Invited Participation

NBER Behavioral Macroeconomics Research Boot Camp	2020
NBER New Developments in Long-Term Asset Management Meeting	2019
Princeton Financial Economics of Insurance Workshop	2019

Honors & Awards

Yale University Fellowship	2018 - 2023
Academic Excellence Scholarship, Tsinghua University	2013 - 2016
Spark Academic Talent Program (Top 2%), Tsinghua University	2014 - 2016
Outstanding Winner (Top 0.4%), Mathematical Contest in Modeling (MCM/ICM)	2015
Goldman Sachs Scholar, Goldman Sachs - Beijing	2014

List of Ph.D. Courses

2020 Theoretical Corporate Finance: H
Behavioral Finance: In progress
Household Finance: In progress
Financial Crises: In progress
Foundations of Macroeconomics and Finance: In progress

2019 Empirical Corporate Finance: H
Econometrics II: H
General Economic Theory (Micro II): H
Continuous-Time Finance: H
Applied Data Mining and Machine Learning: H
Time Series with R and Python: H
Empirical Asset Pricing: HP
General Economic Theory (Macro I): HP
Industrial Organization I: HP

2018 Financial Economics I: H
General Economic Theory (Micro I): H
Econometrics I: H

Miscellaneous

Language: English (Fluent), Mandarin (Native); Nationality: China

Statement

Dear Committee,

I am a second-year Ph.D. student in Financial Economics at Yale School of Management. My research interests lie in corporate finance, behavioral finance, and financial intermediaries. I am applying to the NBER Entrepreneurship Research Boot Camp as I am eager to learn about the cutting-edge research in this burgeoning field and potentially dive into it in the future.

I have developed my interest in corporate finance and behavioral finance over working on related research projects. I worked as Professor Ulrike Malmendier's full-time research assistant from 2016 to 2018. Under her guidance, I investigated how past experiences shape individuals' or institutions' decision-making in a variety of settings, including how banks' past under-capitalization experiences affect their future risk-taking behavior, how FOMC members' inflation expectations are influenced by their personal experiences, etc. There are still many open questions following this line of inquiry, including questions related to entrepreneurship – How do individuals' past experiences affect their incentive to become an inventor or entrepreneur? How are the expectations of managers aggregated in an institution and what does it imply for the institution-level decision-making? How can we design contracts or policies that can take the non-rational beliefs into consideration? With these questions in mind and the hope of understanding them deeper, I started my Ph.D. at Yale SOM.

During my Ph.D. study at Yale, I have been keenly equipping myself with advanced tools in economic theory and econometrics, and actively conducting independent research at the same time. In terms of academic performance, I have achieved a grade of H (Honors, equivalent to A in other institutions) in 10 out of 13 Ph.D. courses (another 4 are ongoing). In terms of research, I have been working on a joint project with Mark Borgschulte (assistant professor at UIUC), Marius Guenzel (Ph.D. student at UC Berkeley), and Ulrike Malmendier. We exploit the introduction of anti-takeover laws in the mid-1980s and industry-level distress shocks to show that increased job demands have significant implications on a previously undocumented yet important aspect of personal cost -- CEOs' life expectancy. On the other hand, we find no evidence that the compensation differential is reflecting this personal cost of health. Furthermore, we advance the use of visual machine learning based method to detect visible

signs of aging in the pictures of the CEOs, and find that experiencing distress shocks during the 2007-2008 recession increases a CEO's apparent age by roughly one year. The project is still ongoing, but has been invited for presentation in selective conferences like NBER Organization Economics Fall Meeting and AFA Annual Meeting.

In my first-year summer paper with Jingxiong Hu (Ph.D. student at Northwestern) and Jiaheng Yu (Ph.D. student at MIT), we study how the introduction of off-exchange broker-dealers, e.g., investment banks, as an alternative venue for end-of-day trading affects the close price informativeness. We first provide empirical evidence showing the sharp increase in the volume of off-exchange closing deals, up from almost zero in 2015 to around 2.5% of the total daily trading volume in 2018. We further show that the close price informativeness has increased together with the off-exchange trading activities. Then we offer a theoretical framework with closed-form solutions to show that the price informativeness will increase under loose parameter restrictions, contradictory to the opinion and concern expressed by NYSE executives and SEC reports. We highlight the investor sorting and information externality mechanisms. I presented the paper in the formal finance lunch seminar at Yale SOM, and the paper has also been invited for presentation in MFA Annual Meeting 2020.

For my early-stage research projects, I have started a joint project with Professor James Choi where we search for a simple reduced-form approximate solution for the household's life-cycle portfolio choice problem, which was traditionally only numerically solved using dynamic recursive method (Cocco, Gomes, and Maenhout, 2005). I also start looking into the labor specificity of firms and industries with Kaushik Vasudevan (fellow Ph.D. student at Yale). We aim to use the O-NET data, Occupational Employment Statistics (OES) data, and Burning Glass data to quantify the specificity of the existing labor in a firm or in an industry, i.e., empirically measure the effective replacement ratio of new labor to existing labor. Constructing this will offer insights in firms' risk from the labor market, especially during the recessions where there is a lot of forced firing.

In my future work, I hope to explore applying the tools I have learned into research in entrepreneurship, especially its intersection with behavioral finance. The NBER would be a great opportunity for me to get exposed to the novel and exciting research that are going on in this field. I sincerely hope that I can be a participant in the workshop and get the chance to learn about this new field and interact with the brightest peers interested in similar questions.

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Stephen and Camille Schramm
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March 26th, 2020

Dear Entrepreneurship Research Boot-Camp Admission Committee (ERBAC),

This is a letter for **Canyao Liu**, a second-year finance PhD student at Yale who is very interested in taking part in the boot camp. He is outstanding, and I recommend him to you very highly.

Canyao is obviously very bright and determined – he is doing very well in his coursework, earning the highest grade in almost all of his classes. But more important, he is showing great promise on the research side too. He came into the program with unusually strong experience – he had worked on research full-time for two years with Ulrike Malmendier – and now has an impressive portfolio to show for it. He is a co-author, with Ulrike, on a remarkable paper about the effect of stress on CEO health. And he has his own paper, one of the best first-year summer papers we have ever seen, on the impact on price informativeness of some new Wall Street trading practices. Meanwhile, despite his heavy load of coursework, he has started two new projects. Overall, in my 15 years at Yale, I have rarely seen a student with this impressive a trajectory at his stage of the program.

Canyao has a number of research interests, and entrepreneurship is one of them. If, through the boot camp, he gets inspired, then you will have won over a first-rate talent to your area of study. While he is interested in entrepreneurship as a field in general, he is also curious about its intersection with another of his interests, namely behavioral economics. He has a hunch that there is a lot more good work that could be done in that area, and I think he is right.

In summary, Canyao is one of the most exciting students we've had in the Yale program for a while, and I highly recommend him; he would be thrilled to attend. (I should also mention that he's a very pleasant person and would interact well with other camp participants).

All best,



Nick B.