March 26th, 2021

Kangying Zhou
165 Whitney Ave Ph.D. Suite, New Haven, CT 06511
Tel: (872) 904-7871
Email: kangying.zhou@yale.edu
Recommendation letter writer: Prof. Song Ma

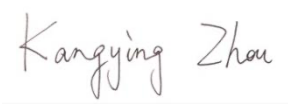
Dear Sir or Madam,

As a second-year financial economics Ph.D. student at the Yale School of Management, I am writing to express my enthusiasm for participating in the 14th Entrepreneurship Research Boot Camp. With my big data and research experience in the equity market, I am especially interested in finding some new data and studying some private equity questions. The research questions involve what risk factors are specific to private equity, how alpha is generated in private equity, and how to build private equity portfolios. This Entrepreneurship Research Boot Camp would help me learn about the datasets, conduct research in the private equity field, and have a deeper understanding about entrepreneurship topics.

Currently, my research projects focus on empirical asset pricing, textual analysis, and machine learning. With my technical skills, one contribution I could make to the entrepreneurship field is finding innovative data and making it available for further research. For example, my first-year paper introduces a textual analysis methodology to capture the topic structure and topic-specific sentiments from financial news articles. This methodology can also be applied to extract private firms' information from their SEC filings. I also want to contribute to the private equity field. Under the supervision of Prof. Bryan Kelly, I conducted research projects on public equity including portfolio construction, alpha, and risk factors. With this experience, I am eager to research private equity and analyze the difference between private equity and public equity.

Based on my experience and future research interest, I am confident that I am well-prepared for this camp and will try to contribute to the entrepreneurship field with the camp's resources. I have contacted Prof. Song Ma as my recommendation letter writer, and I have attached my CV and essay, which further detail my background and interests. Please do not hesitate to reach out if you have any questions. Thank you for your time and consideration!

Best regards,



Kangying Zhou

165 Whitney Ave Ph.D. Suite, New Haven, CT 06511
(872) 904-7871 | kangying.zhou@yale.edu

EDUCATION

YALE UNIVERSITY New Haven, CT
Ph.D. in Financial Economics *Sep. 2019 – Present*

- Completed courses: Empirical Corporate Finance, Empirical Asset Pricing, Financial Economics, Household Finance, Continuous-Time Finance, Mathematical Economics, Econometrics, Microeconomics, Macroeconomics
- Current Courses: Behavioral Finance, Applied Empirical Methods

THE UNIVERSITY OF CHICAGO Chicago, IL
Master of Science in Financial Mathematics *Sep. 2016 – Dec. 2017*

- GPA: 3.7/4.0

HUAZHONG UNIVERSITY OF SCIENCE AND TECHNOLOGY (HUST) Wuhan, China
Bachelor of Science in Economics *Sep. 2012 – Jun. 2016*

- GPA: 3.7/4.0, Class rank: 1/30

RESEARCH & PROJECTS

Maximum Sharpe Ratio Regression *Feb. 2021 – Present*

- Introduced flexible method for integrating predictive signals into mean-variance efficient portfolios
- Embedded machine learning models within the portfolio weight specification to accommodate cross-asset restrictions and non-linear signal transformations

Information Shocks to Bilateral Exchange Rates *Oct. 2020 – Dec. 2020*

- Proposed a factor model to study how country-specific information shocks and global information shocks explain bilateral exchange returns
- In the empirical analysis, the factor model has adjusted R squared between 4.86% and 27.00% for 15 countries, with an average of 16.82%

The Topic-Sentiment-Return (TSR) Model for Return Prediction *Jan. 2020 – Oct. 2020*

- Introduced a new textual analysis methodology, topic-sentiment-return (TSR) model, to capture the topic structure and topic-specific sentiments from financial news articles for return prediction
- Given a news article, the TSR model identifies the topic weights and the sentiment in each topic, then aggregates the topic structure and topic-specific sentiments to generate an article-level predicted return
- The estimation methodology is a supervised learning framework based on Latent Dirichlet Allocation (LDA)

EXPERIENCE

THE UNIVERSITY OF CHICAGO Chicago, IL
Research Assistant, Prof. Dacheng Xiu *May. 2017 – Jul. 2019*

- Introduced a new text-mining methodology that extracts sentiment information from news to predict asset returns, and showed that the model excels at extracting return-predictive signals in news context in empirical analysis
- Developed a unified latent space model to measure co-movements between stock daily returns and news word frequency, solved the model by ADMM algorithm, and got prediction accuracy of 56%
- Applied a model-selection method based on LASSO to evaluate the contribution to asset pricing of a new factor

BLOOMBERG LP New York, NY
Data Analyst in CTO Office *Apr. 2019 – Jul. 2019*

- Extracted firm links from SEC filings and news
- Constructed a momentum factor model to predict stock returns by firm links

SHEFFIELD ASSET MANAGEMENT L.L.C. Chicago, IL
Quantitative Analyst at Long/Short Equity Hedge Fund *Feb. 2018 – Mar. 2019*

- Managed a team of five to develop a sentiment trading strategy by Natural Language Processing, the strategy was adopted by the company to screen stocks and manage risk

TECHNICAL SKILLS

- C++, Python, R, MATLAB, SQL Server, STATA, Latex, MS Office

Unofficial Academic Record

This is NOT an official transcript. A course for which a grade has not been submitted will appear separately under Courses in Progress. COURSES IN YALE COLLEGE, THE GRADUATE SCHOOL, AND THE LAW SCHOOL ONLY: A course will not appear until the instructor has submitted a grade. If a course displays with '***' in the grade column, it is eligible for evaluation. A student must submit a course evaluation or elect to not evaluate the course before the grade will become visible. For students: course evaluations can be accessed through the 'Course Evaluations' tab in SIS.

Transfer Credit Institution Credit Courses in Progress

Transcript Data

SID:
919861202

DEGREE INFORMATION

Sought: Doctor of Philosophy **Degree Date:**

This is NOT an Official Transcript

INSTITUTION CREDIT -Top-

Fall 2019

College: Graduate School of Arts & Sci

Major: Management

Subject	Course	Title	Grade	Credit Hours	Grade Mode	Instructor
ECON	500	Gen Econ Theory:Microeconomics	HP	1.00	Graduate	E. Davila L. Samuelson
ECON	550	Econometrics I	HP	1.00	Graduate	D. Andrews
ECON	670	Financial Economics I	H	1.00	Graduate	J. Ingersoll S. Giglio
ECON	679	Finance Lunch	SAT	1.00	Satisfactory/Unsatisfactory	E. Davila N. Barberis
MGMT	781	PhD Seminar: Acct/Finance	SAT	1.00	Satisfactory/Unsatisfactory	P. Goldsmith-Pinkham A. Zentefis
MGMT	782	PhD PreSeminar:Fin Econ	SAT	1.00	Satisfactory/Unsatisfactory	P. Goldsmith-Pinkham A. Zentefis

Unofficial Academic Record

Spring 2020

College: Graduate School of Arts & Sci

Major: Management

Subject	Course	Title	Grade	Credit Hours	Grade Mode	Instructor
CPSC	577	Natural Language Processing	AUD	1.00	Audit	D. Radev
ECON	501	Gen Econ Theory:Microeconomics	SAT	1.00	Satisfactory/Unsatisfactory	J. Horner R. Iijima
ECON	531	Mathematical Economics II	NA	1.00	Audit	E. Davila
ECON	551	Econometrics II	H	1.00	Graduate	T. Armstrong
MGMT	742	Theoretical Corporate Finance	AUD	0.50	Audit	Z. He
MGMT	744	Household Finance	P	1.00	Graduate	J. Choi
MGMT	745	Behavioral Finance	NA	1.00	Audit	N. Barberis
MGMT	748	Empirical Corporate	H	0.50	Graduate	K. Shue

		Finance					
MGMT	781	PhD Seminar: Acct/Finance	SAT		1.00	Satisfactory/Unsatisfactory	P. Goldsmith-Pinkham A. Zentefis
MGMT	782	PhD PreSeminar:Fin Econ	SAT		1.00	Satisfactory/Unsatisfactory	P. Goldsmith-Pinkham A. Zentefis

Unofficial Academic Record

Fall 2020

College: Graduate School of Arts & Sci

Major: Management

Subject	Course	Title	Grade	Credit Hours	Grade Mode	Instructor
CPSC	553	UnsupervisedLearning Big Data	AUD	1.00	Audit	S. Krishnaswamy
ECON	510	Gen Econ Theory:Macroeconomics	P	1.00	Graduate	Z. Huo F. Zilibotti
ECON	530	Mathematical Economics I	H	1.00	Graduate	J. Geanakoplos
ECON	600	Industrial Organization I	AUD	1.00	Audit	P. Haile M. Igami
ECON	630	Labor Economics	AUD	1.00	Audit	C. Meghir
MGMT	743	Continuous-Time Finance	H	1.00	Graduate	J. Ingersoll
MGMT	747	Empirical Asset Pricing	H	1.00	Graduate	B. Kelly
MGMT	781	PhD Seminar:Acct/Finance	SAT	1.00	Satisfactory/Unsatisfactory	C. LaPoint
MGMT	782	PhD PreSeminar: Financial Econ	SAT	1.00	Satisfactory/Unsatisfactory	C. LaPoint
S&DS	555	Introductory Machine Learning	AUD	1.00	Audit	J. Lafferty

Unofficial Academic Record

COURSES IN PROGRESS -Top-

Fall 2019

College: Graduate School of Arts & Sci

Major: Management

Subject	Course	Title	Credit Hours	Grade Mode	Instructor
ELP	515	Teaching in the Amer Classroom	0.00	Graduate	C. DeRoma

Unofficial Academic Record

Spring 2021

College: Graduate School of Arts & Sci

Major: Management

Subject	Course	Title	Credit Hours	Grade Mode	Instructor
CPSC	452	Deep Learning	1.00	Audit	S. Krishnaswamy
ECON	511	Gen Econ Theory:Macroeconomics	1.00	Audit	G. Moscarini
MGMT	737	Applied Empirical Methods	1.00	Graduate	P. Goldsmith-Pinkham
MGMT	745	Behavioral Finance	1.00	Graduate	N. Barberis
MGMT	781	PhD Seminar: Acct/Finance	1.00	Satisfactory/Unsatisfactory	C. Clayton
MGMT	782	PhD	1.00	Satisfactory/Unsatisfactory	C. Clayton

PreSeminar:Financial Econ

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RELEASE: 7.2

Personal Statement

Kangying Zhou

March 26, 2021

With big data and machine learning techniques, massive data becomes available every day for entrepreneurship research. Based on my big data and research experience in the equity market, I am especially interested in finding some newly available data and studying some questions about private equity (PE). The research questions involve what risk factors are specific to private equity, how alpha is generated in PE, and how to build PE portfolios.

One contribution I could make to the entrepreneurship field is finding innovative data and making it available for further research. For example, private firms have much less data than public firms, and there is no database for private firms like Compustat. However, with natural language processing (NLP) techniques, the private equity information published in SEC filings becomes available. My skills come from some research experience with big data, NLP, and machine learning. In my first-year paper, a textual analysis methodology, the topic-sentiment-return (TSR) model, was introduced to capture the topic structure and topic-specific sentiments from financial news articles for return prediction. Given a news article, the TSR model identifies the topic weights and the sentiment in each topic, then aggregates the topic structure and topic-specific sentiments to generate an article-level predicted return. An estimation methodology was developed as a supervised learning framework based on Latent Dirichlet Allocation (LDA). In another project, I studied a new text-mining methodology that extracts sentiment information from news articles to predict asset returns. This research first isolates a list of sentiment terms via predictive screening, which is interpretable and intuitive. After assigning sentiment weights to these words via topic modeling, the method ag-

gregates terms into an article-level sentiment score via penalized likelihood. In an empirical analysis, a simple trading strategy demonstrates that the news sentiment scores outperform scores from a widely-used commercial vendor in predicting future price moves by a large margin. This experience enables me to extract information from newly discovered data.

Besides, I want to contribute to private equity research, and specific research questions include finding the risk factors specific to PE, how alpha is generated in PE, and how to build portfolios of PE. Under the supervision of Prof. Bryan Kelly, I have some projects studying public equity. For instance, I am working on a Maximum Sharpe Ratio Regression (MSRR) methodology for the research about portfolio construction, which generates mean-variance efficient portfolios from predictive signals. With the data in Jensen, Kelly, and Pedersen (2021), the out-of-sample Sharpe Ratio from Jan 2000 to Dec 2019 is 2.54. In another project about factors and alpha, I studied a model-selection method based on LASSO to evaluate the contribution to asset pricing of a new factor. For other types of assets, I proposed a factor model to study how country-specific and global information shocks explain bilateral exchange returns by constructing news factors with textual analysis. Derived from country-level log nominal SDF, the factor model explains foreign exchange log-returns by four factors: the foreign country-specific news factor, the home country-specific news factor, the global information shock factor, and the risk-free rate difference between the foreign country and the home country. In the empirical analysis, the factor model has adjusted R^2 between 4.86% and 27.00% for 15 countries, with an average of 16.82%. In the entrepreneurship area, I am interested in applying the modeling methods in private equity research with my research experience, including risk factors, alpha, and portfolio construction.

To achieve my research goals, I sincerely hope I could join your distinguished camp. I am looking forward to reading the papers on the syllabus, form the structure of each topic in this area, and connect with world-class researchers in this field. Based on my research experience and future research interest, I am confident that I am well-prepared for this camp and will try to contribute to the entrepreneurship field with the camp's resources.

Yale SCHOOL OF MANAGEMENT

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Assistant Professor of Finance

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New Haven CT 06511

Re: Recommendation Letter for Kangying Zhou

Dear David and the Review Committee,

I am writing to recommend Ms. Kangying Zhou for the 2021 NBER Entrepreneurship Research Boot Camp. Kangying is a PhD student in finance from Yale School of Management and has strong interests in entrepreneurship and innovation.

To start from the conclusion—Kangying gets my strong recommendation. I have no doubt that she will be a valuable boot camper for the class of 2021.

Kangying is well trained in economics and finance and has incredibly strong technical skills and economic intuition. Her ability to introduce new empirical tools to economic research impresses me (and many of my colleagues at the Yale Finance group) constantly. She is growingly interested in using her skills in tackling entrepreneurship, private equity, and innovation related topics, and I cannot think of a better place that can give her this training than the boot camp.

The boot camp will for sure teach Kangying valuable lessons ranging from the literature, the appreciation of research questions, among other things. I have no doubt (but will personally monitor to ensure) that Kangying will read all required papers carefully and actively contribute to the discussion in class. I will also work closely with her and give advice as she explores the literature more broadly.

All told, Kangying is an extremely promising PhD student who is eager to learn more about and conduct research in entrepreneurship and entrepreneurial finance. I hope that you give Kangying serious consideration for a spot in the boot camp this year. Please do not hesitate to contact me for any further questions.

Sincerely yours,

