NBER Household Finance Small Grants Proposal

PI: Lei Gao, Co-PI: Sun Hua

Department of Finance, College of Business, Iowa State University, Ames, IA 50011

Introduction

The title of my proposed project is "The Rainbow of Credit". We have a preliminary draft now and we need to improve the paper with new results to improve the paper. The preliminary draft has been circulated with field prestigious researchers and accepted to present at a few Conferences. The paper has policy implications. And we will make the resulting data publicly available to the extent possible. It is also a quite relevant topic that contribute to discussions on financial market regulations, especially short selling regulations on the Wall Street.

Using the Home Mortgage Disclosure Act (HMDA) national data from 1990 to 2014, augmented by the classical 1990 Boston Fed data and Fannie Mae Loan Performance data, we propose a method to identify potentially homosexual borrowers and test whether their perceived homosexual status affects the approval, cost, and performance of the mortgages for which they apply. The results reveal that, in contrast with otherwise comparable loan applicants, potentially homosexual applicants are less likely to be approved. Furthermore, conditional on being approved, they tend to pay higher interest rates. Meanwhile, we find no evidence that the homosexual status is associated with higher default risk; there is contrary evidence that despite the higher financing cost, homosexual borrowers' loans tend to perform better.

This study investigates whether mortgage lenders are more likely to deny applicants who are potentially homosexual than other applicants with similar backgrounds. Following recent research, such as Munnell et al.'s (1996) Boston Fed study and Ross and Yinger's (2002), we first applied the settings similar to previously studied racial- and gender-based discrimination to our research question. This way, our results would be as robust as those from previous literature and the discrimination level would be contextualized. We started our test with a national sample of data from the Home Mortgage Disclosure Act (HMDA) from 1990 to 2014, and we confirmed the homosexual discrimination results within the large dataset. What is more, the longer period and wider scope of the national level data allowed us to study the trend of homosexual mortgage discrimination over time and geographic variation.

However, due to the limited coverage of borrower information in HMDA, we did not have as many control variables as in the classical Boston Fed study's data. Therefore, we extended our

analysis to the 1990 Boston Fed data, and we got similar results with the additional control variables on borrower and loan characteristics.

Over the course of this study, we have made several contributions to discrimination study literature. First, we found evidence that there is significant discrimination against LGBT group mortgage applications, and we quantified the degree of the discrimination. This important mortgage loan discrimination problem has been overlooked in the current literature, and has led to erroneous assumptions on the financial equality among groups based upon their sexual orientation. This study fills in the gap by testing same-sex co-applicants to shed light on the existence and the degree of lending discrimination against the homosexual group. Second, our findings have strong implications for policy makers. There is no terms in HMDA and other credit regulation laws about differential treatments based on sexual orientation up till today. We provide empirical evidence that the perceived homosexuality has been an under-investigated factor in financing cost. Last but not least, we propose a method to identify potentially homosexual borrowers (households) via HMDA data. As shown in section 4.1, when we compare our measured state-level percentage of homosexual borrowers with the 2012 Gallup survey on the adult LGBT population percentage, the correlation is remarkably high at 0.76. Although this study focuses on lending discrimination against homosexual borrowers, our method can be used to merge HMDA with other data sets, such as the Panel Study of Income Dynamics (PSID to study other research topics regarding LGBT society that can be otherwise difficult to identify.

Timeline

We have finished a preliminary draft. We requested some comments from some prestigious finance researcher and presented the paper once. Based on the comments from finance researchers, we plan to improve the paper with new results by August 2017, and submit it to premier journals in December 2017. At the same time, we will also submit the paper to other most selective conferences to get more constructive comments.

Evidence of the applicant's proficiency in research

While we are tenure-track assistant professors, we have managed to publish a few papers in top Finance and Real Estate journals.

Detailed Budget

1. Data collection/acquisition/research equipment, $14,000
2. Project travel: $6,000
   Total: $20,000

Lei Gao, Ph.D.

CURRICULUM VITAE

ADDRESS

Department of Finance
College of Business
Iowa State University
Ames, IA 50011

CONTACT INFORMATION

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Phone (C): 517-303-3672
Email: lgao@iastate.edu

ACADEMIC APPOINTMENT

- **Assistant Professor of Finance (on Tenure Track)** JUN 2014–Present
  College of Business , Iowa State University, Ames, IA
- **Assistant Professor of Finance (on Tenure Track)** AUG 2012–MAY 2014
  Fogelman College of Business and Economics, University of Memphis, Memphis, TN

EDUCATION

- **Ph.D. in Finance**, Terry College of Business, University of Georgia MAY 2012
- **M.S. in Industrial Math**, Dept. of Mathematics, Michigan State University MAY 2006
- **B.S. in Computer Science**, Peking University, Beijing, China JULY 2000

RESEARCH INTERESTS

- Financial Markets
- Corporate Finance
- Corporate Governance
- Financial Innovation

HONORS AND AWARDS

- Best Paper Award, Eastern Finance Association(EFA) 2016
- Research Bootstrap Grant, Iowa State University 2016, 2015, 2014
- International Research Travel Grant, Iowa State University 2015
- Principal Financial Faculty Professional Development Grant, Iowa State University 2014
- Summer Research Fund, University of Memphis 2013
- Woodruff Award, University of Georgia 2009
- Comer Award, University of Georgia 2009, 2007
- Summer Research Award, University of Georgia 2008
- Certificate of Business Management and Communication Skills Program, Michigan State University 2005
- Industrial Mathematics Fellowship, Michigan State University 2005
- Canon Scholarship, Peking University 1999

- Outstanding Student Leader, Peking University 1998, 1997
- Motorola Scholarship, Peking University 1997
- Second Prize in National Physics Olympiad, China 1994
- Third Prize in National Chemistry Olympiad, China 1994

PUBLICATIONS

1. Firms' earnings smoothing, corporate social responsibilities, and valuation, with Zhang, J.. ***Journal of Corporate Finance***. 32 (2015): 108-127
2. Corporate patents, R&D success, and tax avoidance, with Yang, L., and Zhang, J. .***Review of Quantitative Finance and Accounting***. 7 (2015): 1-35
3. Corporate governance and performance of financial institutions, with Zagorchev, A. .***Journal of Economics and Business***. 82 (2015): 17-41
4. Investor attention and abnormal performance of timberland investments in the United States, with Mei, B.. ***Forest Policy and Economics***, 28 (2013): 60–65.
5. Intelligent transportation systems: an impact analysis for Michigan, with Farooq, U., Siddiqui, M., and Hardy, J.. ***Journal of Advanced Transportation***, 46 (2012): 12–25.
6. Security price responses to unexpected earnings: a nonparametric investigation, with Wang, L. . ***Statistical Methods and Applications***, 20(2011): 241–258.
7. Economic impact/forecast model of intelligent transportation systems in Michigan: an input output analysis, with Farooq, U., Hardy, J.,and Siddiqui, M. . ***Journal of Intelligent Transportation System***, 12 (2008): 86–95.

WORKING PAPERS

1. Intraday Momentum: The First Half-Hour Return Predicts the Last Half-Hour Return, with Han, Y., Li, S., and Zhou, G. (2015). ***R&R at Review of Financial Studies; SSRN Top 10 download list*** **in several categories**. (MARC 2015, NFA 2015, FMA 2014)
2. Long-term stock returns following stock splits, the blind side, with Elnahas, A. and Ismail, G. (2015). ***R&R at the Financial Review***. (MFA2016, EFA2015, AAA 2014)
3. Corporate Goodness as a Signaling Device: Evidence from a Quasi-natural Experiment, with He, J., and Wu, J. (2016). ***Under Review at the Accounting Review; Media Coverage: Harvard Law School Forum***. (FARS 2016, MFA2016)
4. The Rainbow of Credit, with Sun H. (2016). ***Under Review at Review of Financial Studies***.
5. Local Religious Beliefs and Hedge Fund Risk-Taking Behaviors. with Wang, Y. and Zhao, J. (2016). ***Under Review at Journal of Corporate Finance***. (MFA 2016, WFC 2016, EFA 2016 **Best Paper Award**)

6. The Real Effects of CEO Narcissism and Top Management Personality Heterogeneity: the International Evidence, with Sun, H., Wu, H., and Zhu, W. (2016). ***Under Review at Journal of International Business Studies***.

7. The Impact of Exogenous Corporate Governance Changes on Innovation and Market Value, with Zagorchev, A. (2016). ***Invited submission at Quarterly Journal of Finance***. (MFA 2017)

8. Industry peer firms' earnings predictability, financial crises and IPO underpricing, with Rezaee, Z., and Yu, J. (2016+). ***Under Review at Journal of Banking and Finance***. (FMA 2014, AAA 2014)

9. The Pathogen, Scapegoat, or a Miracle Drug? Short Selling and Stock Price Crash Risk, with Deng, X. and Kim, J. (2016). ***Ready to submit, SSRN Top 10 download list, Media Coverage: Oxford Business Law Blog(OBLB)*** . (WFC 2014, ABFC 2014)

10. Online Information Acquisition and Investor Trading, with Li, O., and Yeung, E. (2016+). ***SSRN Top 10 download list***.(FMA 2013, FARS 2012, CFEA 2011)

11. Efficient Estimation of Partially Linear Models for Spatial Data over Complex Domains. with Wang, L., Wang, G., and Lai, M. (2016). ***Ready to submit*** .

12. Unintended consequences of policymakers deliberations on the 2013 fiscal cliff, the ATRA, and partial government shutdown, with Rezaee, Z. and Park, J. (2015). ***Under Review at JATA*** (AAA 2015)

13. Multi-market information flows: market efficiency and return predictability, with Deng, X. and Kemme, D. (2016). (MFA 2015, FMA 2015)

14. Information asymmetry, management entrenchment, and capital structure: evidence from the Sarbanes-Oxley Act of 2002, (2016+). (FMA 2012)

15. Industry peer firm earnings quality and IPO underpricing in the Pre and Post-SOX Era, with Rezaee, Z., and Yu, J. (2016). (FMA 2016)

16. Short selling, post-earnings-announcement drift, earnings surprises, and consecutive earnings surprises, with Hery, T and Sun, M. (2016+). (FMA 2015, AAA 2014)

17. Institutions trading around material information announcements. with Jain, PK. and Sharma, V. (2016+). (NFA 2014)

OTHER PUBLICATIONS

1. CMEIAS v3.0 UPGRADE: Advanced image analysis software to strengthen microscopy-based approaches for understanding microbial ecology. *The 11th International Symposia in Microbial Ecology, Vienna, Austria*, with Dazzo, F., et al. (2006).

2. CMEIAS v3.0: Advanced image analysis software to strengthen microscopy-based approaches for understanding microbial ecology. *The 2006 Kellogg Biological Station Long-term Ecological Research Symposium and Poster Forum*, with Dazzo, F., et al. (2006).

3. Integrating heterogeneous systems in logistics industry with web services technology. *The 10th Industrial Engineering and Engineering Management*, with Yuan, X. (2003).

TEACHING EXPERIENCE

- **Assistant Professor**, Dept. of Finance, Iowa State University

  FIN320 Investments FALL 2014, 2015; SPRING 2017

  FIN425 Security Analysis and Portfolio Management FALL 2014, 2015, 2016; SPRING 2015, 2016, 2017

- **Assistant Professor**, Dept. of Finance, Insurance & Real Estate, University of Memphis

  FIR3710 Investments (online) SPRING 2013, 2014; FALL 2012, 2013

  FIR3710 Investments SPRING 2013

  FIR6721 FIR4721 Financial Derivative Markets SPRING 2014

- **Instructor**, Dept. of Banking & Finance, University of Georgia

  FINA3000 Financial Management SUMMER 2008, 2009

  FINA4920 Computers in Finance SPRING 2009, 2012; FALL 2008

- **Instructor**, Dept. of Mathematics, Michigan State University

  MTH 124 Survey of Calculus I SPRING 2006; FALL 2005

  MTH1825 Intermediate Algebra (online) SUMMER 2005

  MTH 133 Calculus II SPRING 2005

  MTH 116 College Algebra and Trigonometry FALL 2004

- **Instructor and Translator**, Center for International Trade and Security, U. of Georgia
  Delivered or simultaneously interpreted lectures to large international firms' executives.

  Financial Management instructor, and other sessions' translator 2009–2011

OTHER WORKING EXPERIENCE

- **Programmer/Analyst**, Michigan Millers Mutual Insurance, Lansing, MI 2006–2007
- **Project Lead/E-Commerce Engineer**, OOCL , Shanghai & SanJose, CA 2000–2004

PROFESSIONAL MEMBERSHIP

- American Finance Association (AFA)
- European Finance Association(EFA)
- Financial Management Association (FMA)
- American Accounting Association (AAA)
- Northern Finance Association (NFA)
- Midwestern Finance Association (MFA)

- American Mathematical Society (AMS)

SERVICES

- **Service To the Department**

Research Seminar Committee	2015–
Business Learning Teams Committee	2014–2015
Coordinator of ISSM Information Technology	2012–2014
Department Representative to Library	2012–2014
Oral Exams MSBA Finance Committee	2012–2014

- **Journal Editing Service**

Editor Assistant, Journal of Corporate Finance 2008–2012

- **Journal/Book Referee Service**

Journal of Corporate Finance (2016, 2015, 2014, 2013, 2012, 2011, 2010)
Journal of Banking and Finance (2017, 2016)
The Financial Review (2017, 2016, 2015, 2013)
The European Journal of Finance (2016)
Journal of Business Ethics (2016)
International Review of Economics and Finance (2016)
Journal of Applied Statistics (2008)
Book review on "*Financial Management*" by S. Titman, A. Keown and J. Martin. 2010

- **Conference Committee, Chair, and Referee Service**

Financial Management Association Conference	2016, 2015, 2014, 2013, 2012
Midwestern Financial Association	2016, 2015
Southern Financial Association	2011, 2010
Eastern Financial Association	2012

- **Discussion**

Financial Management Association Conference	2016,2015, 2014, 2013, 2012
Midwestern Financial Association	2016
Southern Financial Association	2010
Eastern Financial Association	2012

STUDENTS SUPERVISION

- **Advising Visiting Scholar**

Renshu Yuan (Xiamen University).

- **Collaboration with Memphis Ph.D. Finance students**

Mohamed Mekhaimer (Clarkson U.), Ahmed Elnahas (Eastern Kentucky U.), Ghada Ismail (Eastern Kentucky U.), Xiaohu Deng (4th year), Vivek Sharma (4th year), Minxing Sun (3rd year), Wei Sun (2nd year).

- **Exam Committee Member for MSBA Finance students**

  Jordan Lee Stroupe (2014), Eric Williams (2013), Richard Bou (2013), James Moye (2013, Chair), W. R. Toler (2013), William Arnold (2012).

CONFERENCE/SEMINAR PRESENTATIONS

- **2016**

  Financial Management Association Meetings, Las Vegas (2 papers, 1 discussion)
  American Accounting Association Conference*, New York
  University of Iowa, Iowa City
  Iowa State University, Ames
  Nankai University, Tianjin
  Shandong University, Jinan
  Xiamen University, Xiamen
  Wuhan University, Wuhan
  Southwestern University of Finance and Economics, Chengdu
  Financial Accounting and Reporting Section (FARS) Midyear Meeting, Newport Beach
  Midwestern Finance Association Meetings, Atlanta (2 papers)
  Eastern Finance Association Meetings*, Baltimore
  World Finance Consortium*, New York

- **2015**

  Financial Management Association Meetings, Orlando (2 papers)
  Midwestern Finance Association Meetings, Chicago (2 papers)
  Mid-Atlantic Research Conference in Finance (MARC)*, Philadelphia
  American Accounting Association Conference, Chicago
  Northern Finance Association Conference (NFA), Lake Louis,
  ITAM Finance Conference*, Mexico City
  Southwestern Finance Association Meetings*, Houston

- **2014**

  Financial Management Association Meetings, Nashville (2 papers)
  American Accounting Association Conference, Atlanta (3 papers)
  Australasian Finance & Banking Conference, Sydney
  World Finance Consortium, Singapore
  Northern Financial Association Conference, Ottawa
  The China International Conference in Finance, Chengdu
  International Symposium on Financial Engineering and Risk Management*, Beijing
  Tsinghua University Workshop*, Beijing

Iowa State University, Ames

- **2013**

  Financial Management Association Meetings, Chicago
  University of Mississippi, Oxford

- **2012**

  Financial Management Association Meetings, Atlanta
  Financial Accounting and Reporting Section (FARS) Midyear Meeting, Chicago
  Research Affiliates, Newport Beach
  University of Memphis, Memphis
  University of Georgia, Athens

- **2011**

  Financial Management Association Meetings, Denver
  Conference on Financial Economics and Accounting, Bloomington
  University of Georgia, Athens (2)
  Eastern Finance Association Annual Meetings, Savannah

- **2010**

  Southern Finance Association Annual Meetings, Asheville

- **2008**

  University of Georgia, Athens

Curriculum Vitae — Last updated: January, 2016

Hua Sun

Contact Information

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Iowa State University
3282 Gerdin Business Building
College of Business
Iowa State University, Ames, IA 50010 USA

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E-mail: hsun@iastate.edu

Research Interests

Real Estate Finance, Corporate Finance, Behavior Finance/Economics, Urban and Housing Economics, Spatial Econometrics

Education

Sauder School of Business, The University of British Columbia, Vancouver, BC CANADA

Ph.D., Real Estate Finance, 2009

Dissertation Topic: "Three Essays in Real Estate Markets"

Advisor: Tsur Somerville

M.Sc., Real Estate Management, 2003
The National University of Singapore, SINGAPORE

B.A., Economics, 1999
Nankai University, P.R.CHINA

Employment

Iowa State University
Assistant Professor of Finance, August, 2014 ∼ present
California State University, San Bernardino
Associate Professor of Finance (with tenure), September, 2013∼ July, 2014
Assistant Professor of Finance, September 2008 ∼ August, 2013

Advisory Services

Chaffey College Advisory Committee, 2012∼2014

Honors & Awards

California State University, San Bernardino

- University Summer Research Fellowship, 2009, 2011,2012
- Professor Across the Border Grant, 2012
- Merrell Research Fellowship, 2009, 2012
- Research Mini-grant, 2010, 2011
- CBPA Outstanding Research Award, 2011
- CBPA GBPF Research Grant, 2011,2012,2013

The University of British Columbia

- Graduate Conference Travel Award, 2008
- E.D. MacPhee Fellowship, 2003 $\sim$ 2007
- University Graduate Fellowship, 2006
- Herbert R. Fullerton Fellowship, 2005
- Alan G. Creer Fellowship, 2005
- Suzanne Seto Scholarship, 2004
- E.T. Cantell Scholarship, 2004
- A. George Oikawa Scholarship, 2004

The American Real Estate and Urban Economics Association

- Ph.D Conference Travel Award, 2008

The National University of Singapore

- Graduate Research Scholarship, 2001 $\sim$ 2003
- University Graduate Fellowship, 2002

Nankai University

- Fundamental Research Scholarship, 1996 $\sim$ 1997

Professional Services

Ad Hoc Referee

- Journal of Real Estate Finance and Economics, Journal of Real Estate Research, International Real Estate Review, Emerging Markets Finance and Trade, Communications in Statistics: Theory and Methods, Natural Hazards (NHAZ), Pan-Pacific Journal of Business Research

Research Activity

Refereed Journal Articles

- The Impact of LEED Neighborhood Certification on Condo Prices, (with Julia Freybote and Xi Yang),*Real Estate Economics*, 43 (3): 586-608 (2015)
- Bidding Heterogeneity, Signaling Effect and Its Implications on House Sellers Pricing Strategy, (with S E. Ong) *Journal of Real Estate Finance and Economics*, 49(4): 568-597 (2014)
- Hyperbolic Discounting, Reference Dependence and its Implications for the Housing Market, (with Michael Seiler) *Journal of Real Estate Research*, (lead article),35(1): 1-24 (2013)

- A Theory on REITs Advisor Choice and the Optimal Compensation Mechanism, *Journal of Real Estate Finance and Economics*,(lead article),40(4): 387-411 (2010).
- Spatial Autocorrelations and Urban Housing Market Segmentation,(with Y. Tu and S M. Yu), *Journal of Real Estate Finance and Economics*,34(3): 385-406 (2007).
- REIT Splits and Dividend Changes: Tests of Signaling and Information Substitutability, (with Q. Li and S E. Ong), *Journal of Real Estate Finance and Economics*,33(2): 127-150 (2006).
- A Spatio-temporal Autoregressive Model for Multi-unit Residential Market Analysis, (with Y. Tu and S M. Yu), *Journal of Real Estate Finance and Economics*,31(2): 155-187 (2005).
- Transaction Based Office Price Indices: A Spatio-temporal Modeling Approach, (with Y. Tu and S M. Yu), *Real Estate Economics*,32(2): 297-328 (2004).

Working Papers

- Common Agency with Common Effort: A Case in Real Estate Brokerage, (with Zhaohui Li), *under substantial revision*
- Stock Split, Ex-post Conditioning and a Separating Equilibrium Puzzle (with Qiang Li)
- Loss Aversion in the Housing Market: A Revisit,(with Michael Seiler)
- Informed Speculation about Trading Flows: Price Variability and Trading Volume, (with Qiang Li)

Conference Presentations

- 2014: American Real Estate Society Annual Meeting (San Diego)
- 2014: Pan-Pacific Business Research Institute Annual Conference (San Bernardino)
- 2013: Pan-Pacific Business Research Institute Annual Conference (Pomona)
- 2011: Maastricht-NUS-MIT Real Estate Research Conference (Maastricht)
- 2011: Pan-Pacific Business Research Institute Annual Conference (San Bernardino)

- 2010: American Real Estate and Urban Economics Association Annual Conference (Atlanta)
- 2009: American Real Estate Society Annual Conference (Monterey)
- 2008: American Real Estate and Urban Economics Association Annual Conference (New Orleans); THU-HKU-NUS International Real Estate Research Symposium (Beijing)
- 2006: HKU-NUS International Real Estate Research Symposium (Hong Kong)
- 2003: Inaugural NUS - HKU International Real Estate Research Symposium (Singapore); Reading-Aberdeen Symposium on international commercial property research, RICS Foundation and Real Estate Economics (Isle of Skye, Scotland, United Kingdom)

Courses Taught

Iowa State University

FIN 472: Real Estate Finance (undergraduate)
FIN 474: Real Estate Investment (undergraduate)

California State University, San Bernardino

FIN 585: Real Estate Finance (joint MBA and undergraduate)
FIN 481: Real Estate Practice (undergraduate)
FIN 480: Real Estate Appraisal (undergraduate)
FIN 380: Principles of Real Estate (undergraduate)
FIN 314: Corporate Financial Management (undergraduate)
FIN 313: Business Finance (undergraduate)

The University of British Columbia, Vancouver, BC CANADA
Sessional Instructor **2004-2007**
Co-taught undergraduate level course for Comm307 (Real Estate Investment). Shared responsibility for lectures, exams, homework assignments, and grades.

Teaching assistant for Comm405 (Real Estate Finance) and Comm407 (Real Estate Economics)

Other Services

Iowa State University

- Joint Ag Econ/Real Estate Faculty Search Committee (2014 $\sim$ 2015)

California State University, San Bernardino

- University Associate Provost Search Committee
- University Copyright and Fair Use Committee
- University Outcomes Assessment Committee
- College of Business and Public Administration Journal Quality Committee
- College of Business and Public Administration Academic Grant Award Committee
- College of Business and Public Administration Student Scholarship Committee
- College of Business and Public Administration Assurance of Learning Committee
- Accounting Advisory Board/ AACSB Accreditation Committee
- Department of Accounting and Finance RPT Evaluation Guideline Committee
- Department of Accounting and Finance Curriculum Committee (committee chair, 2011 $\sim$ 2013)

Academic Affiliations

American Finance Association (AFA)
Financial Management Association (FMA)
American Real Estate and Urban Economics Association (AREUEA)
American Real Estate Society (ARES)

References

Available upon request