DAVID ZHANG

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Academic Appointments

Assistant Professor of Finance, 2022-Present
Jones Graduate School of Business, Rice University, Houston, TX

Education

Ph.D. in Business Economics, Harvard University, 2016-2022
Committee: John Campbell (chair), Adi Sunderam, Edward Glaeser, Ariel Pakes, Robin Lee
Fields: Real Estate Finance, Household Finance, Industrial Organization

B.A. in Economics and Mathematics, Amherst College, 2009-2013, *summa cum laude*

Teaching Experience:

2023-2024 Spring	MGMT 746 Real Property, Instructor
2022-2024 Fall	MGMT 648 Applied Finance, Instructor
2020 Spring	Ec 2727 Empirical Methods in Finance, Teaching Fellow for Samuel Hanson and Adi Sunderam
2018 Summer	APMA S-115 Mathematical Modelling, Teaching Fellow for Zhiming Kuang
2018 Fall	Ec 2610 Industrial Organization I, Teaching Fellow for Ariel Pakes and Robin Lee
2017 Fall	Ec 2610 Industrial Organization I, Teaching Fellow for Ariel Pakes and Robin Lee

Other Experience:

2024-2025	Visiting Scholar at the Federal Reserve Bank of Atlanta
2019-2024	Visiting Scholar at the Federal Reserve Bank of Boston
2019-2020	Research Assistant to Professors Ariel Pakes, Mark Shepard, and Kate Ho
2017	Research Assistant to Professor Adi Sunderam
2014-2016	Research Assistant at the Federal Reserve Bank of Boston
2013-2014	Junior Economist at Legal Economics

Professional Activities:

Invited presentations:

2025: AEA, AREUEA/ASSA (discussant), MFA[*,s], Baylor University[s].

2024: AEA, University of Iowa (Tippie), University of Rochester (Simon), University of Colorado Boulder[*], CICF (discussant), Cornell Economics Alumni Conference, Philadelphia Fed Mortgage Markets Conference, AREUEA National Conference, MoFiR Conference on Banking, UCLA/SF Fed Conference (discussant), Northeastern Finance Conference[*], University of Washington Fostering Inclusion Workshop[*], PUC-Chile Virtual Seminar, Federal Reserve Bank of Atlanta Seminar, MIT GCFP 11th Annual Conference[*], University of Toronto Financial Economics Conference, Georgetown University (McDonough), National University of Singapore, Colorado Finance Summit.

2023: AREUEA/ASSA (2x), CityUHK, Penn State (Macro), UCLA/SF Fed Conference, FHFA, Zillow, Boulder Conference on Consumer Finance, SFS Cavalcade North America (discussant), AREUEA National Conference (discussant), North American Summer Meeting of the Econometric Society (NAMSES), Western Finance Association (WFA), Northern Finance Association (discussant), Lone Star Finance Conference, FMA[*].

2022: CFPB Research Conference, Chicago Booth Household Finance Conference, NBER Summer Institute Real Estate Conference, UEA Conference (presenter, discussant), North America Summer Meeting of the Econometric Society (NAMSES), AREUEA National Conference, Chicago Fed Conference on Risk and Racial Bias (discussant), Asian Meeting of the Econometric Society, CityUHK, HKU, Texas A&M, SMU, Boston College, University of Toronto Rotman & Mississauga, Purdue University, Rice University, Federal Reserve Board, University of Minnesota, University of Colorado Boulder, OSU PhD Real Estate Conference.

2021: Stanford Institute for Theoretical Economics (SITE), NBER Summer Institute Household Finance Conference, NBER Summer Institute Monetary Policy Conference[*], SFS Cavalcade North America, Financial Intermediation Research Society (FIRS), CFPB Research Conference, Society of Labor Economists (SOLE), Southwest Finance Association (SWFA), Royal Economics Society (RES), Swiss Society for Financial Market Research (SGF), Asian Meeting of the Econometric Society, International Association for Applied Econometrics (IAEE), OSU PhD Real Estate Conference, Week-After Conference on Financial Markets and Institution[*].

2020: Winter Meeting of the Econometric Society, Atlanta Fed/Princeton Bendheim Conference on Racial Justice and Finance[*], System Applied Microeconomics Conference, System Econometrics Conference[*].

2018: International Industrial Organization Conference.

[*] Indicates presentation by co-author, [s] indicates scheduled presentation

Conference organization:	2025 EFA Conference Program Committee
	2025 SFS Cavalcade Program Committee
	2025 Georgia Tech-Atlanta Fed Household Finance Conference Program Committee
	2024 EFA Conference Program Committee
	2024 MFA Conference Program Committee
	2024 AREUEA/ASSA Program Committee
	2023 Lone Star Conference Program Committee
	2022 SFA Program Committee
Referee Service:	*Quarterly Journal of Economics, Journal of Finance, Journal of Financial Economics, Review of Financial Studies, Management Science, Journal of Monetary Economics, Journal of Urban Economics, Journal of Political Economy: Microeconomics, Journal of Banking and Finance, Real Estate Economics, Review of Corporate Finance Studies, Journal of Housing Economics, Journal of Empirical Finance, Managerial and Decision Economics, Managerial Finance, International Review of Economics & Finance*

Honors, Scholarships, and Fellowships:

2024	Jensen Prize (First Place), Journal of Financial Economics
2024	UD/Philly Fed Fintech Financial Institutions Conference Best Paper Prize
2021	Best Paper Award, OSU PhD Real Estate Conference
2019	Lab for Economic Applications and Policy (LEAP) grant, Harvard University

2018	Certificate of Teaching Excellence, Harvard Bok Center for Teaching and Learning
2018	Wayfair Datathon, 1st place team, $20000 prize
2016-2021	Harvard Business School Doctoral Fellowship
2013	Bernstein Prize in Economics

Publications:

Gerardi, Kristopher, Paul S. Willen, and David Hao Zhang. 2023. "Mortgage Prepayment, Race, and Monetary Policy". *Journal of Financial Economics* 147 (3):498–524. Editor's Choice, March 2023. Jensen Prize (First Place), July 2024.

Ishii, Jun, and David Hao Zhang. 2017. "*Options Compensation as a Commitment Mechanism in Oligopoly Competition*". *Managerial and Decision Economics* 38 (4):513–525.

Shy, Oz, Rune Stenbacka, and David Hao Zhang. 2016. "*History-based versus uniform pricing in growing and declining markets*". *International Journal of Industrial Organization* 48:88–117.

Working Papers:

"*Mortgage Lock-in, Lifecycle Migration, and the Welfare Effects of Housing Market Liquidity*", with Kristopher Gerardi and Franklin Qian

We use a search and matching model to study the heterogeneous welfare effects of housing market illiquidity due to mortgage lock-in over the lifecycle. We find that younger home buyers are disproportionately affected by mortgage lock-in, which disrupts their typical pattern of moving to higher-quality neighborhoods. We estimate a model with heterogeneous seller-buyers bargaining within markets defined by CBSA-income terciles and with endogenous migration across markets. We find that on average mortgage lock-in reduces household listing probabilities by 21--23%, increases time on the market by 52--142%, increases house prices by 3%--8%, and decreases match surplus by 3%--29% through its effects on the search and matching process. The pricing and match surplus effects are larger for younger households and for households in lower-income areas, due to a higher idiosyncratic dispersion in buyer valuation leading to larger match surplus variation in those areas. Our study highlights the welfare benefits of market thickness in real estate markets.

"*Small Mortgages and the Rise of FinTech and Shadow Banks*", with Yongqiang Chu and Tim Zhang

The growing presence of FinTech and shadow banks could have spillover effects on bank lending. We study this possibility in the context of small mortgages, which are low balance mortgages primarily originated by brick-and-mortar banks and retained in their portfolios. Using a shift-share instrument while testing for confounders, we find that areas more exposed to FinTech and shadow bank growth have significantly higher small mortgage denial rates. Through subsample analyses, we find that reduced CRA requirements and contraction in bank presence are the likely causal mechanisms. Further analyses show a corresponding reduction in small mortgage origination as well as lower owner occupancy shares among originated small mortgages. Overall, our results suggest that the rise of FinTech and shadow banks plays a role in the declining availability of small mortgages, potentially contributing to lower homeownership rates among less affluent households.

"*Algorithmic Underwriting in High Risk Mortgage Markets*", with Janet Gao and Livia Yi **(R&R at Journal of Finance)**

We study the effects of a policy that shifted from pure human underwriting to human-augmented algorithmic underwriting for low-credit-score, high-leverage mortgage borrowers. Estimating the bunching of loans around the policy's debt-to-income threshold, we find a large credit expansion to affected borrowers with little changes in default risks or interest rates among the affected group. Such effects are more pronounced among non-Hispanic White borrowers and higher-income borrowers. Consequently, low-credit-score households are more likely to move to better school districts. We use a structural

approach to quantify the welfare implications of the policy change and isolate the credit supply channel. Overall, our results suggest that automated underwriting systems (AUS) can help increase financial inclusion while controlling risk. However, it can also generate disparate impact across racial groups and along the income distribution.

"*Closing Costs, Refinancing, and Inefficiencies in the Mortgage Market*"
I use a structural model to quantify the cross-subsidization in the US mortgage market due to heterogeneous borrower refinancing tendencies. Actively refinancing borrowers gain up to 4.4% of their loan amount relative to non-refinancing borrowers in expectation. In equilibrium, the presence of borrowers with high refinancing inertia reduces mortgage interest rates particularly on lower upfront closing cost mortgages which have more valuable refinancing options. As a result, actively refinancing borrowers refinance excessively relative to a perfect information, no cross-subsidization benchmark, an effect that accounts for 36% of the rate and term refinances for 2013--2019 new purchase originations and generates deadweight losses due to administrative resource costs. Alternative contract designs can simultaneously reduce transfers and increase total welfare.

"*Testing for Discrimination in Menus*", with Paul Willen **(R&R at American Economic Review)**
How should researchers test for differences in the menus of options that people face when given data on choices? In mortgage and labor contexts, we show how intuitively appealing regression-based approaches for assessing differences in menus can lead to misleading and contradictory results. To address this issue, we use pairwise dominance relationships in choices that can be supplemented by restrictions on the range of plausible menus to define (1) a test statistic for equality in menus and (2) a difference in menus (DIM) metric. We also derive a new procedure for inference on our class of problems. Finally, we apply our methodology to a novel data set linking 2018--2019 Home Mortgage Disclosure Act (HMDA) data to Optimal Blue rate locks. We find evidence for mortgage menu differences by race, particularly among Conforming mortgage borrowers who are relatively creditworthy.

"*The Cost of Being Underbanked: Racial Disparities in Access to PPP Loans and its Equilibrium Implications*", with Jeffrey Wang
Many government support programs for small businesses are designed to pass through banks and credit unions. However, this poses barriers for minority communities that are less connected to financial institutions for obtaining this support. Using the latest program for supporting small businesses, the Paycheck Protection Program (PPP), as an example, we show that there was a large disparity in the density of PPP enrolled lenders by racial composition of the neighborhood. This difference is both due to a lower density of lenders in those neighborhoods in general, and by the fact that the banks and credit unions that do operate there are smaller, are less likely to have previous relationships with the Small Business Administration, and are less likely to enroll in the program. More heavily Black neighborhoods have significantly lower take-up of PPP loans particularly in lower population (more rural) areas where this disparity is most salient. Through an instrumental variables analysis, we show that the intensive margin of access to enrolled lenders can explain about 35% of the racial disparity in take up within the relevant areas. Our results suggest that government programs that provide "support through banks" can have undesirable distributional implications.

"*Do Judge-Lawyer Relationships Influence Case Outcomes?*", with Tianwang Liu
We examine whether law school alumni relationships between the lawyers and judges affect case outcomes. We show that in the context of medical malpractice lawsuits in Florida, the plaintiff lawyer sharing the same law school as the judge increases the chances of recovery by 2%. Furthermore, the effect is confined to younger lawyers who see a 4% increase in the likelihood of recovery from having been to the same law school as the judge, and is absent in older lawyers. We interpret our results as evidence that lawyers gain school-specific human capital from their law schools which helps in their interactions with judges that graduated from the same school, and that this school-specific human capital become less important further on in the lawyers' careers.

"*Semi-Parametric Estimation of Counterfactuals in Dynamic Discrete Choice Models*"
I develop a new method for estimating counterfactuals in dynamic discrete choice models, a widely used set of models in economics, without requiring a distributional assumption on utility shocks. Applying my method to the canonical Rust (1987) setting, I find that the typical logit assumption on utility shocks can lead the researcher to conclude that the agent's counterfactual choice probabilities are much more sensitive to policy changes than what a semi-parametric model would suggest. Therefore, my method may be useful to applied researchers in generating policy counterfactuals that are robust to such distributional assumptions.

<u>Citizenship Information:</u>
Canadian citizen, US Permanent Resident