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:

2022-2025 Spring	MGMT 648 MBA Applied Finance, Instructor
2023-2024 Spring	MGMT 746 MBA Real Property, 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-Now	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 (presenter, discussant), Federal Reserve Bank of Philadelphia, Georgia Tech-Atlanta Fed Consumer Credit Conference[*], pre-WFA Real Estate Conference[*], WFA, SFS (discussant), NBER Summer Institute Real Estate[*], NFA, UNC Junior Finance Conference (discussant), Holden Conference on Real Estate and Finance (discussant), Baylor University (Economics)[s], Dartmouth College (Tuck)[s], HKU (Finance)[s], 4th CEMLA / Dallas Fed Financial Stability Workshop[s], University of Houston (finance)[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 (Finance), 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:

2026 SFA Cavalcade Program Committee
2026 Georgia Tech-Atlanta Fed Household Finance Conference Program Committee
2026 MFA Conference Program Committee
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, Review of Economic Studies, Journal of Financial and Quantitative Analysis, Management Science, Journal of Monetary

Economics, Journal of Urban Economics, Journal of Political Economy: Microeconomics, Real Estate Economics, Journal of Housing Economics, Journal of Banking and Finance, Review of Corporate Finance Studies, Journal of Empirical Finance, Journal of Financial Research, 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:

"*Measuring the Impact of the NAR Settlement*", with Jefferson Duarte
We study the 2024 National Association of Realtors (NAR) settlement as a policy shock to real estate intermediation. Using MLS and survey data, we find a modest rise in unrepresented buyers, with little change in commission rates or the market share of discount and fintech brokers. One mechanism for the modest effect is that settlement places greater responsibility on buyers to negotiate agent fees, yet they seldom do so. Further survey experiments indicate that behavioral biases, such as underreaction to fees not salient as the buyer's responsibility, suppress negotiation. Our results imply that policy design may be more effective if it incorporates behavioral biases.

"*The Distributional Effects of GSE Pricing on Home Purchases*", with You Suk Kim and Feng Liu
The guarantee fee (g-fee) pricing of government-sponsored enterprises (GSEs) plays an important role in distributing credit. We study the distributional effects of g-fee pricing on relative home purchase volumes using a stacked differences-in-differences design based on recent g-fee adjustments. We find large elasticities of relative home purchase volume to g-fee pricing, consistent with a calibrated model of frictional housing search. Furthermore, the elasticities are larger (smaller) for higher income borrowers among the subsidized (subsidizing) credit score groups. Overall, our results suggest that g-fee pricing has large distributional effects on home purchases that may be regressive in the income dimension.

"*Is There a Puzzle in Underwater Mortgage Default?",* with Lara Loewenstein, Paul Willen, and Yuxi Yao
A longstanding question in the mortgage default literature is why underwater default is so rare relative to model predictions. We find that the incentive to default may be limited even for deeply underwater households. We build a model incorporating realistic house price-to-rent dynamics, the choice of house

sizes, and a minimal non-pecuniary default penalty, and find (1) a default rate is below 8% among all loan-to-value ratios, (2) more than 90% of the defaulter have seen an income drop of at least 30% since the mortgage origination, with the average income drop similar across loan-to-value ratios, and (3) 8% of defaults are driven purely by negative equity, comparable to the estimate in Ganong and Noel (2023). We present further empirical results supporting our findings. Our results suggest that the lack of widespread strategic default among underwater households is not necessarily financially suboptimal, and reinforce the theoretical effectiveness of cash-flow based interventions.

"*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.

"*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.

"*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.

"*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.

"*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.

"*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.

Citizenship Information:
Canadian citizen, US Permanent Resident