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Citizenship: US

Fields of Concentration:

Finance
Real Estate

Desired Teaching:

Finance
General Equilibrium
Real Estate Economics
Introductory Microeconomics
Game Theory

Comprehensive Examinations Completed:

2013 (Oral): Empirical Finance
2013 (Oral): Theoretical Finance
2012 (Written): Macroeconomics
2012 (Written): Microeconomics

Dissertation Title: *Essays on Housing, Mortgages, and the Financial Crisis*

Committee:

Professor John Geanakoplos
Professor Andrew Metrick
Professor John Eric Humphries

Degrees:

Ph.D., Economics, Yale University, 2019
M.Phil., Economics, Yale University, 2015
M.A., Economics, Yale University, 2015
A.B., Mathematics, University of Chicago, 2007

Fellowships, Honors, and Awards:

University Dissertation Fellowship, Yale University, 2015 – 2016
Austen Colgate Fellowship, Yale University, 2015 - 2016
Cowles Foundation Fellowship, Yale University, 2012 - 2016
Nathan Hale Associates Fellowship, Yale University, 2013 - 2014
Anonymous Fellowship, Yale University, 2013 – 2014
Mathematics Department Honors, University of Chicago, 2007
General Honors, University of Chicago, 2007
Dean’s List, University of Chicago, 2004 – 2007

Teaching Experience:

Teaching Assistant to Prof. John Geanakoplos, Financial Theory (U), Yale College, 2014
Faculty of Math, Computer Science, and Robotics, Choate Rosemary Hall, 2008 – 2012
Teaching Intern, Phillips Exeter Academy Summer School, 2007
Teaching Assistant in Mathematics, Calculus (U) & others, Univ. of Chicago, 2005 – 2007

Research and Work Experience:

Senior Economist, SpringHarbor Financial Group, 2017 – 2019
Consulting Economic Policy Advisor, Sen. Cory Booker, 2017 – 2018
Quantitative Researcher, Ellington Management Group, 2012 – 2017
Consulting Economic Policy Advisor, Hillary for America, 2014 – 2016
Mathematics, Writing, and English Tutor, Advantage Testing of Westchester, 2007 – 2008

Working Papers:

“Mortgage Default: A Heterogeneous-Agent Model,” (November 2019), *Job Market Paper*.

“An Agent-Based Model of the Housing Market Bubble in Metropolitan Washington DC,” with Robert Axtell, Benjamin Conlee, Ernesto Carella, Doyne Farmer, John Geanakoplos, Jon Goldstein, Matthew Hendrey, Peter Howitt, David Masad, and Nathan Palmer, (2014), in [*Whitepaper for Deutsche Bundesbank’s Spring Conference on “Housing markets and the macroeconomy: Challenges for monetary policy and financial stability.”*](#)

Works In Progress:

“Cheap Credit: Leverage in the Subprime Mortgage Crisis,” (2014).

“Endogenous Leverage and Credit in an Agent-Based Model of the Housing Market,” with John Geanakoplos, (2017).

Seminar and Conference Presentations:

“Mortgage Modifications and Macroeconomic Policy,” Yale School of Management Program on Financial Stability *Fighting a Financial Crisis* Conference, August 2019

“Mortgage Modifications and Macroeconomic Policy,” Federal Reserve Bank of New York, August 2019

“Credit Availability, House Prices, and the Great Recession,” Federal Reserve Bank of New York, July 2016

“Calculating the Credit Surface,” Ellington Management Group, September 2015

“Credit Availability and the Housing Market,” Federal Reserve Bank of New York, October 2015

“An Agent-Based Model of Housing,” Ellington Management Group, March 2015

Languages:

English (native), French (intermediate), German (beginner)

References:

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Dissertation Abstract

[Mortgage Default: A Heterogeneous-Agent Model, *Job Market Paper*](#)

I introduce a loan-level model of mortgage default with heterogeneity in borrower characteristics and mortgage terms. The model generalizes existing models, embedding the strategic and double-trigger models as special cases in a family unified by an idiosyncratic, non-pecuniary penalty for default. The model fits not only the aggregate level of defaults but also cross-sectional characteristics of the distribution of mortgage performance throughout the financial crisis. The model’s structural specification and its support for loan- and borrower-level heterogeneity enable investigating policies that exploit heterogeneity in the population of borrowers. I show that the main government mortgage modification programs could have been substantially improved through such policies, in particular by offering principal forgiveness to underwater borrowers who were ex ante identifiable as more likely to default.

An Agent-Based Model of the Housing Market Bubble in Metropolitan Washington DC, with Robert Axtell, Benjamin Conlee, Ernesto Carella, Doyne Farmer, John Geanakoplos, Jon Goldstein, Matthew Hendrey, Peter Howitt, David Masad, and Nathan Palmer

We develop a computational model of a regional housing market. Over a million distinct agents buy, sell, and rent houses according to different behavior rules, which depend on demographic, financial, and housing stock characteristics we estimate using data in the Washington, D.C. metropolitan area from 1997 – 2009. We use both individual record-level matching and statistical inference on several dozen disparate datasets to simulate a single joint distribution of household characteristics. Households' transactions endogenously generate a housing market bubble and crash that resembles the observed history not only in the timing and magnitude of the boom and bust in home prices, but also in other aggregate dynamics such as time-on-market, homeownership rate, and vacancy rate and in distributional characteristics such as house prices across tiers of building quality and loan performance across bands of credit quality. We use the model to study the drivers of the bubble. We show that low risk-free interest rates do not generate a house price bubble when credit availability is restricted, whereas loose credit contributes to a bubble even without low risk-free rates.

Cheap Credit: Leverage in the Subprime Mortgage Crisis

I examine loan-level mortgage origination data in the US throughout the boom and bust period from 1998 – 2008. Existing literature has alternately pointed to loose credit as a driver of the rise in house prices leading up to the 2007-8 US Financial Crisis, or argued that mortgage leverage did not rise significantly in the run-up to the crisis and therefore could not have been a significant driver of the rise in house prices. I compare three different mortgage origination datasets to investigate the discrepancy. Linking loans at the property level shows that loan-to-value ratios at origination did increase before the crisis. Leverage rose especially for less creditworthy borrowers, many of whom would have been excluded from getting a mortgage at all in times of tighter credit. The origination data are consistent with the view that loose credit supply fueled the bubble.