

**UNIVERSITY OF PENNSYLVANIA**

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**Personal Information:** Male, China (F-1 visa)

**Undergraduate Studies:**

B.A., Mathematical Economics, Fudan University, 2013

**Master Level Works:**

M.A., Economics, University of Pennsylvania, 2020  
M.A., Economics, University of California, Santa Barbara, 2015

**Graduate Studies:**

University of Pennsylvania, 2015 to present  
Thesis Title: "Essays on Housing Markets and Mortgage Finance"  
Expected Completion Date: May 2021

**Thesis Committee and References:**

Dirk Krueger (Co-Advisor)  
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**Research Fields:**

Macroeconomics, Urban Economics, Household Finance, Real Estate Economics

### **Teaching Experience:**

Fall, 2020	Public Finance, Penn, TA for Prof. Hanming Fang
Spring, 2018- Spring, 2020	Urban Real Estate Economics (Undergraduate/MBA), the Wharton School, TA for Prof. Susan Wachter
Spring, 2019- Spring, 2020	International Housing Comparisons (Undergraduate/MBA), the Wharton School, TA for Prof. Susan Wachter
Fall, 2016- Spring, 2017	Intermediate Microeconomics, Penn, TA for Prof. Rakesh Vohra and Kenneth Burdett
Spring, 2015	Intermediate Microeconomics, UC Santa Barbara, TA for Prof. Kelly Bedard
Fall, 2014- Winter, 2015	Microeconomic Theory I & II (Graduate), UC Santa Barbara, TA for Prof. Zach Grossman and Cheng-Zhong Qin
Spring, 2014	Principle of Macroeconomics, UC Santa Barbara, TA for Prof. Javier Birchenall
Fall, 2013- Winter, 2014	Principle of Microeconomics, UC Santa Barbara, TA for Prof. Jon Sonstelie

### **Research Experience and Other Employment:**

2019-present	Penn Institute of Urban Research, Affiliated PhD Student
2017-present	The Wharton School, RA for Prof. Susan Wachter
2017-present	Penn Wharton GIS Lab, Graduate Research Assistant
2014	UC Santa Barbara, RA for Prof. Ted Bergstrom
2012	UCLA, Cross-disciplinary Scholars in Science and Technology (CSST) Summer Research Program

### **Professional Activities:**

Presentation	
2019-2020	14 <sup>th</sup> Meeting of UEA, Philadelphia; 2020 ASSA-AEA Meeting, San Diego; 2020 ASSA-AREUEA Meeting, San Diego; 36 <sup>th</sup> ARES Meeting, Fort Meyers (canceled)
2018-2019	2018 Midwest Macroeconomics Meetings, Nashville; 13 <sup>th</sup> Annual Economics Graduate Students Conference, WUSTL; 2019 ASSA-AREUEA Doctoral Session, Atlanta; 3 <sup>rd</sup> Annual PhD Conference on Real Estate and Housing, OSU; 47 <sup>th</sup> AREUEA National Conference, DC; ESCP-TAU-UCLA Conference on Low-Income Housing Supply and Housing Affordability, Madrid Spain
2017-2018	46 <sup>th</sup> AREUEA National Conference, DC
Discussant	“Why Are Housing Cost Rising?” by C. Makridis, 2020 AREUEA-ASSA Conference, San Diego “Land Use Controls Do Not Reduce the Elasticity of Housing Supply in the Standard Urban Model” by D. Broxterman and Y. Liu, 14 <sup>th</sup> Meeting of Urban Economics Association, Philadelphia
Co-organizer (2018-2019)	Financial Intermediation and Markets (FIM) Reading Group (jointly held by Wharton finance and economics department)

### **Honors, Scholarships, and Fellowships:**

2015-2020	University Fellowship, Penn
2020	AREUEA Dissertation Award, AREUEA
2020	Mack Institute PhD Research Fellowship, the Wharton School
2019-2020	GAPSA Research Travel Grant, Penn

2018-2020	SASgov Travel Grant, Penn (x2)
2019	Doctoral Travel Grant, AREUEA
2017-2019	SAS Dean's Travel Subvention, Penn (x2)
2017-2019	Xinmei Zhang Fellow, Penn
2014-2015	Thormahlen Family Fellowship in Economics, UC Santa Barbara
2013-2014	Graduate USAP Fellowship, UC Santa Barbara

### **Research Papers:**

#### **“Housing Search and Rental Market Intermediation” (Job Market Paper)**

Rental brokers as the matchmakers between tenants and landlords contribute 80% of the rental listings in certain markets, but how they smooth the search friction and transmit policy impacts is not well understood. This paper is the first to use a listing-agent matched data set from an online platform to show the heterogeneous impact of the listing capacity of a broker, *i.e.* the agent size, on the rental market outcomes. I document that brokers with greater listing capacity are related to lower rents and shorter listing duration. The dispersion cannot be fully explained by the amenity difference of rentals and points to a sizable agent impact that a broker with greater capacity lists a rental at a lower rent. I develop a search model that features a search-and-matching process in which the capacity constraints of brokers interact with the tenant coordination friction. The capacity constraints differentiate brokers' ability to coordinate tenant search. The smaller rent premium for listings by larger brokers reflects the capacity benefit that larger brokers coordinate tenant search better by reducing the likelihood of facing a binding capacity constraint. An endogenous agent distribution of the listing capacity, which summarizes how frictional the rental market is, arises in the model. I evaluate the counterfactual effects of two rental market policies. First, I show that expanding the brokerage sector will not benefit tenants in the search process. As the mean agent size decreases, the rental market becomes more frictional. Second, I evaluate the impact of shifting the commission liability from tenants to landlords, which is central to the New York rental market reform. As the equilibrium rent increase cannot fully compensate the commission cost on landlords, the policy decreases rental supply and makes searching tenants worse off. I characterize the optimal allocation of the broker's fee and show that brokers with greater listing capacity should list more rentals with the fee paid by landlords.

#### **“Land Use Regulation, Regulatory Spillover and Housing Prices” (with Susan Wachter) Under Review**

We estimate the effect of city land use regulation on housing prices in the presence of regulatory spillover. The total effect of regulation is decomposed into a direct effect in which regulation lowers housing productivity and an indirect effect in which household location choice mitigates the price effects of regulatory restrictions. Using housing sales data from California, we structurally estimate a closed-form housing price equation based on a housing model with spatial arbitrage. We find that the total price effect of a one standard deviation increase in city restrictiveness is 9.3% on average, ranging from 4.1% to 14.4% across cities. The spillover effect is economically significant, with the size of the indirect effect equal to 21% of the direct effect for an average city, ranging from 0 to 47%. We point to the importance of identifying direct and indirect effects by controlling for regulation in surrounding locations. For jurisdictions with the power to impose regulation on a larger number of locations, regulation has a stronger price impact due to limits on regulatory spillover.

#### **“Mortgage risk premiums during the housing bubble” (with Adam Levitin and Susan Wachter) *The Journal of Real Estate Finance and Economics* (2020): 60 (4), 421-468.**

How did pricing for mortgage credit risk change during the years prior to the 2008 financial crisis? Using a database from a major American bank that served as trustee for private-label mortgage-backed securitized (PLS) loans, this paper identifies a decline in credit spreads on mortgages conditioned on loan and borrower characteristics. We show that observable risk factors, FICO score and loan-to-value ratio, had less of an impact on mortgage pricing over time. As the volume of PLS mortgages expanded and lending terms eased,

risk premiums failed to price the increase in risk.

“[\*Endowments and Minority Homeownership\*](#)” (with Arthur Acolin and Susan Wachter) *Cityscape* (2019): 21 (1), 5-62.

Fifty years after the adoption of the 1968 Fair Housing Act that prohibits discrimination in the housing market, homeownership rates have not increased for Black or Hispanic households. The current homeownership rate for Black households is 42 percent, identical to the 1970 census reported level, and 48 percent for Hispanic households, lower than that in 1970. Using data from the 1989, 2005, and 2013 American Housing Surveys, we identify the extent to which group differences in household endowments account for persistently low minority homeownership levels.

“[\*Housing Boom, Mortgage Default and Agency Friction\*](#)”

The housing prices and the mortgage credit witnessed faster growth than GDP in the run-up of the Great Recession. I document a mortgage market puzzle during the boom period: (1) the mortgage risk measured by the *ex post* delinquency increased, but (2) the mortgage spread decreased. The default risk premium alone cannot explain the decreasing mortgage spread in the boom episode. I develop a dynamic general equilibrium model of the housing and the mortgage markets with borrowers, depositors, and intermediaries to explain the empirical fact. The model features the tightness of the lending condition and the mortgage risk as the aggregate shocks, which generate the time-varying liquidity and default premiums in the mortgage spread. I quantify the contribution of the aggregate risks to the boom-bust dynamics before and after the Great Recession. A plausible size of the income shock alone is insufficient to generate the observed movement in the mortgage spread. The model shows that lending relaxation that eases the leverage constraint of an intermediary leads to the increasing mortgage credit and the decreasing mortgage spread in the boom period. The lending condition shock generates pro-cyclical leverage of intermediaries that amplifies the aggregate shocks in the boom-bust dynamics.

### **Research Papers in Progress:**

“*Nonbank Mortgage Lending, Regulation and Macroeconomic Transmission*”

“*Yes, in My Backyard: Sharing Economy and Neighborhood Impact in New York City*” (with Betty Wang)

“*The Amenity Value of Green Space: Evidence from Philadelphia*” (with Shane Jensen and Susan Wachter)

“*The Distributional Impact of QM Patch and DTI Relaxation*” (with Susan Wachter)

### **Book Chapters**

Lin, D., Renninger, A., Thornton, A. T., Wachter, S. M., & Zeng, D. Z. (2019). *City Story: House Prices and Competitiveness. House Prices: Changing the City World: The Global Urban Competitiveness Report (2017-2018)*, 257.

**Languages:** Chinese (Native), English (Fluent)

**Computational Skills:** Matlab, R, Stata, LaTeX, ArcGIS