

# Rushing into American Dream? House Prices, Timing of Homeownership, and Adjustment of Consumer Credit

Sumit Agarwal<sup>1</sup>   Luojia Hu<sup>2</sup>   Xing Huang<sup>3</sup>

<sup>1</sup>National University of Singapore  
Department of Economics, Finance and Real Estate

<sup>2</sup>Federal Reserve Bank of Chicago

<sup>3</sup>Michigan State University  
Department of Finance

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# Questions

“... for now, the housing market’s brisk rebound over the past few years has exacerbated a familiar problem for many first-time buyers: financing.”

— *Housing Recovery Increasingly Prices Out First-Time Buyers*, WSJ.

“Some want-to-be home buyers are entering the market now instead of later because they are afraid that prices will shoot up if they wait. ”

— IHS Global Insight note.

## Questions:

- How does house price growth affect the timing of first-home purchase?
- Around first-home purchase, would individuals adjust their other credit behavior differently if they buy their houses earlier vs later?

# It is Important!!

Our focus is **first-home purchase**.

- The timing of first-home purchase could be a powerful driver of the market.
  - First-home purchase constitutes a main part of marginal demand in the current housing market. (40% of sales, on average, over the past 30 years, and more than 50% in 2009, according to the National Association of Realtors.)
  - First-home purchase affects the demand for trade-up homes in the future housing market. (Ortalo-Magne and Rady, 2006).
- Home purchase may have significant effects on other financial behaviors, since it is highly levered and probably the largest single investment of the household.

# Hypothesis

- **Credit-constraint channel:** House price grows faster  $\Rightarrow$  tightens the credit constraints of young households  $\Rightarrow$  delays young households' first-home purchases.
- **Expectation channel:** Higher house price growth  $\Rightarrow$  raises lenders' or households' expectation on future house prices (Case, Quiley and Shiller (2003)).
  - Supply side: higher expectation lowers the estimated default loss for lenders  $\Rightarrow$  loosen the credit constraints  $\Rightarrow$  the ability of young households to afford a home purchase increases (Mian and Sufi (2009))
  - Demand side: higher expectation gives more incentives to young households to buy a home earlier.

# Our Paper

- 1 studies the effect of house price growth on first-home purchases.
  - exploits a large panel of individuals from the FRBNY Consumer Credit Panel (CCP) dataset.
    - more precise information than survey data; contains detailed geographic information; large representative sample.
  - **Results preview:** Individuals purchase their first houses at a younger age if they face higher house price growth.
- 2 studies the influence of first-home purchase on individuals' other credit behaviors.
  - **Results preview:** Younger buyers make more adjustments in their finances after the home purchase – taking out more debt/credit, and yet they do not appear to experience larger increase in delinquency than older buyers.

# Consumer Credit Panel Data<sup>1</sup>

- Track individuals' access to and use of credit at a quarterly frequency.
- Sample period: 1999 - 2012.
- Representative random sample
- Rich information about various loan or credit accounts.
- Key variables: age, address, credit score, mortgage history, etc.
  - We measure **the age of first-home purchase** based on the age of the individual's oldest mortgage account.
  - We consider an individual to be a **home owner** in a given year  $t$  if he or she purchased a home in  $t$  or earlier.

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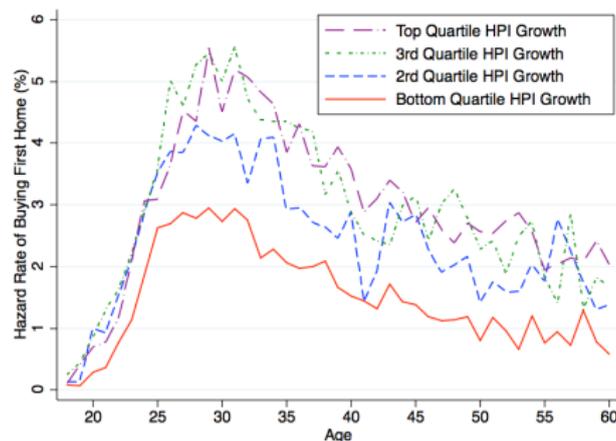
<sup>1</sup>For more details, please refer to Lee and van der Klaauw (2010).

# Timing of First-home Purchase

**Hazard rate:** what is the probability that an individual will buy a home in a given year, given that he or she never bought a home in a previous year?

- We keep the observations until the individual's first home purchase.

- Hazard rate = 
$$\frac{\text{Total number of individuals buying a house at } t}{\text{Total number of individuals who've never bought a home before } t}$$



# Influence of House Price Growth: Multivariate Analysis

$$\begin{aligned}
 h_{ict}(a) &= Pr(Buy_{iact} = 1 | Buy_{iac\tau} = 0, \tau < t) = Pr(y_{iact}^* > 0) \\
 &= \Lambda(\beta_1 \cdot \text{House price growth}_{ct} + \beta_2 \cdot \text{Age}_a \\
 &\quad + \text{Year}_t + \text{CBSA}_c + X'_{it}\eta_1 + M'_{ct}\eta_2)
 \end{aligned}$$

where  $\Lambda(\cdot)$  is the logistic CDF  $\Lambda(u) = \frac{e^u}{1+e^u}$ .

- $\text{House price growth}_{ct}$  : 3-year moving average of HPI growth for city  $c$  from  $t - 3$  to  $t$ .
- $\text{Age}_a$  : =1 if individual  $i$  is at age  $a$ .
- $\text{Year}_t$  : year effect.
- $\text{CBSA}_c$  : CBSA effect.
- $X'_{it}$  : individual time-varying variable, e.g. credit score.
- $M'_{ct}$  : city time-varying variable, e.g. regional employment and wage data from the Quarterly Census of Employment and Wages (QCEW), local unemployment rate from the BLS.

## Influence of House Price Growth: Regression Results

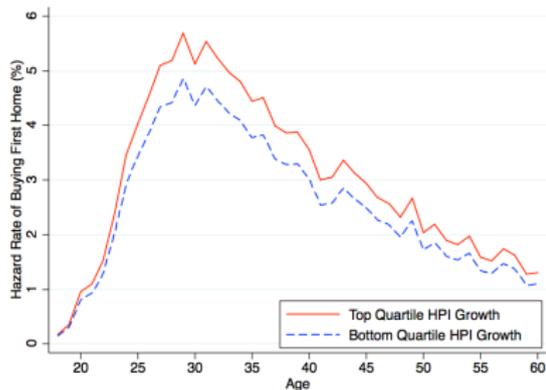
	(1)	(2)	(3)
HPI growth measure:	3-year HPI growth from t-3 to t	Quartile dummy for 3-year HPI growth from t-3 to t	Quartile dummy for 2-year HPI growth from t-3 to t-1
HPI growth	0.502 [0.262]*		
2nd quartile HPI growth CBSAs		0.140 [0.043]***	0.103 [0.042]**
3rd quartile HPI growth CBSAs		0.130 [0.049]**	0.137 [0.048]***
4th quartile HPI growth CBSAs		0.173 [0.050]***	0.175 [0.047]***
Credit score (time-varying)	0.006 [0.000]***	0.006 [0.000]***	0.006 [0.000]***
Annual average employment growth	0.004 [0.006]	0.004 [0.006]	0.004 [0.006]
Average weekly wage growth	0.008 [0.006]	0.008 [0.006]	0.008 [0.006]
Average quarterly growth in number of establishments	-0.003 [0.004]	-0.002 [0.004]	-0.003 [0.004]
Unemployment rate	-0.026 [0.013]**	-0.027 [0.013]**	-0.028 [0.013]**
Observations	523,768	523,768	523,768
Year dummies	Yes	Yes	Yes
Age dummies	Yes	Yes	Yes
CBSA dummies	Yes	Yes	Yes

Standard errors in brackets \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

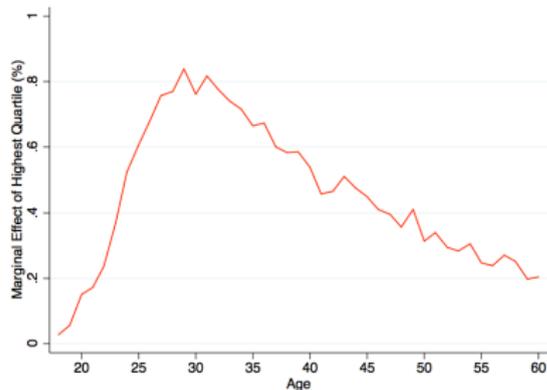
# Evaluate the Magnitude of the HPI Effect

Two counterfactual scenarios (simulations):

- 1 Individuals have always lived in the cities with the lowest HPI growth.
- 2 Individuals have always lived in the cities with the highest HPI growth.

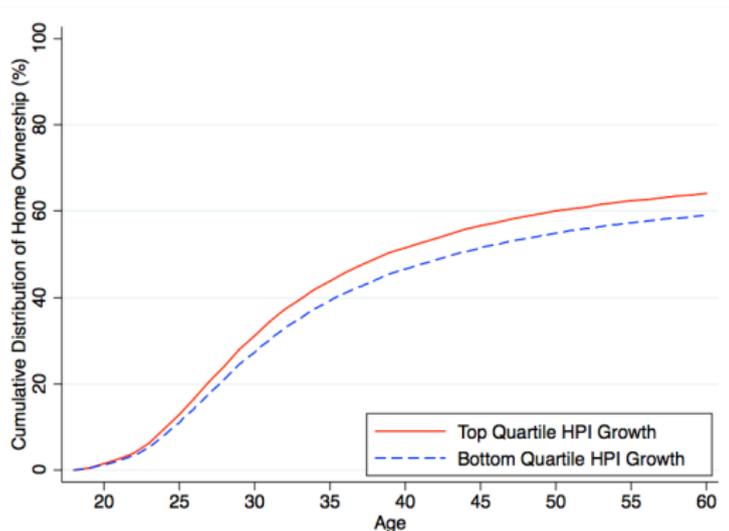


(a) Hazard Rate of Buying First Home by Age



(b) Marginal Effects of Highest Quartile HPI Growth

# Cumulative Distribution of First-home Purchase by Age (Two Scenarios)



- The difference in the median age of first-home buyers is about 5 years.

## Do Young and Middle Age People Adjust Differently?

If house prices grow faster, individuals choose to purchase their first home in an earlier age.

**Question:** Do individuals adjust their other credit behavior differently around first-home purchase when they buy the home earlier rather than later?

- Balances on different categories of credit/loan accounts.
- Credit scores and delinquency rates on different categories of credit/loan accounts.

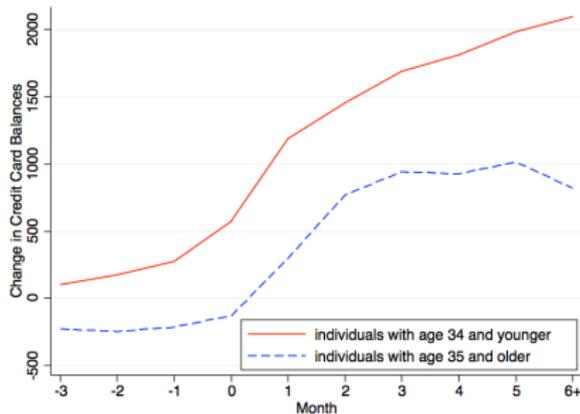
# Event Study: Adjustment around First-home Purchases

*a la* Jacobson, Lalonde & Sullivan (1993)

$$Y_{iact} = \alpha_i + \sum_{k=-3}^6 \beta_k \cdot \mathbf{1}_{t-\tau^*=k} + \sum_{k=-3}^6 \eta_k \cdot \mathbf{1}_{t-\tau^*=k} \cdot \mathbf{1}_{a(\tau^*) \geq 35} \\ + \text{Age}_a + \text{Year}_t + \text{CBSA}_c + \epsilon_{it}$$

- $Y_{iact}$  : Outcome variable, including credit score, credit/loan balances in various accounts, delinquency rate.
- $\alpha_i$  : Individual effect, which captures the level of the outcome variable three years before the first-home purchase.
- $\mathbf{1}_{t-\tau^*=k}$  : dummy variable which is equal to 1 if year  $t$  is  $k$  years since the first-home purchase year  $\tau^*$ . ( $k = 6$  stands for  $t - \tau^* \geq 6$ .)  
 → Coefficients  $\beta_k$  captures the change of the outcome variable relative to the individual's past, controlling for age, year and city effects.

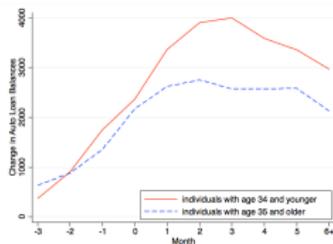
# Adjustment of Consumer Credits



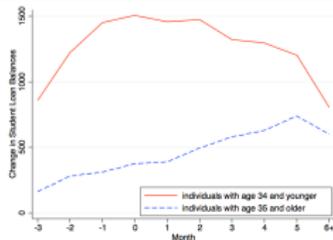
(a) Credit Card Balances  
(Obs = 127739, Joint test of diff: P-value = 0.0000)

## Adjustment of Consumer Credits

Younger buyers live upon more credits in their credit cards and auto loans, and repay their student loans more slowly, relative to older buyers.

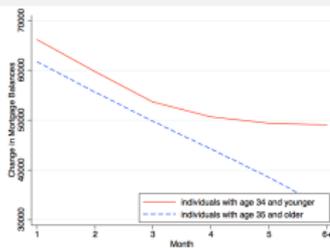


(b) Auto Loan Balances  
(Obs = 127739, Joint test of diff: P-value = 0.0000)

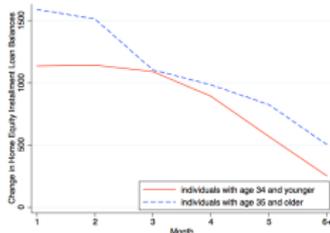


(c) Student Loan Balances  
(Obs = 127739, Joint test of diff: P-value = 0.0005)

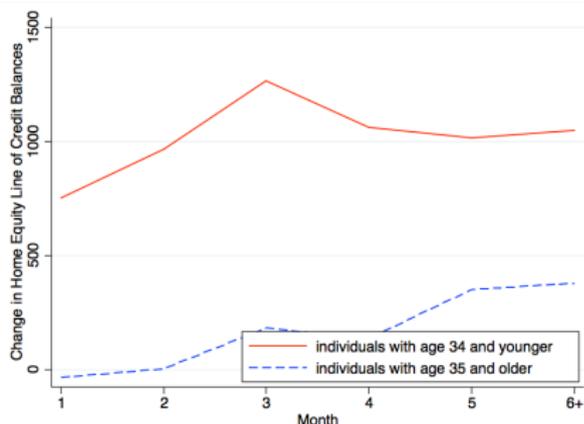
# Pattern in Home Equity-Based Borrowing



(a) Mortgage Balances  
(Obs = 16688, Joint test of diff: P-value = 0.0036)



(b) Home Equity Installment Loan Balances  
(Obs = 16688, Joint test of diff: P-value = 0.0245)

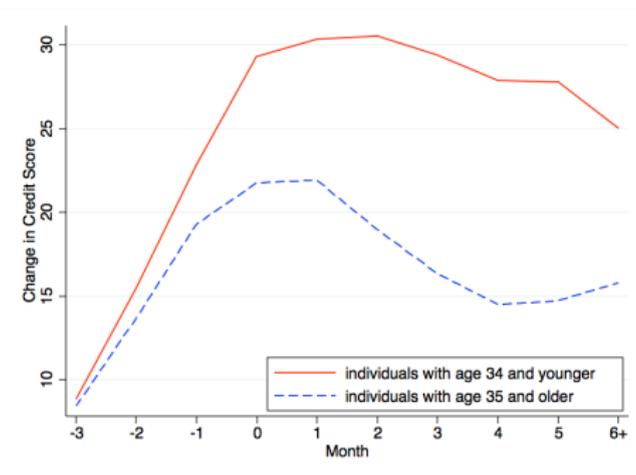


(c) Home Equity Line of Credit Balances  
(Obs = 16688, Joint test of diff: P-value = 0.0082)

## Pattern in HE-Based Borrowing

Younger buyers pay a smaller downpayment, and repay mortgage slower than older buyers; Besides, younger buyers also borrow significantly more money from home-equity line of credit.

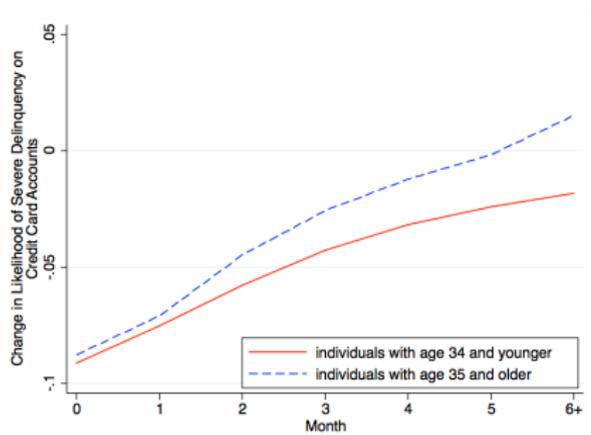
## Change in Credit Scores



### Change in Credit Scores

- Scores increase before home-purchase, more for younger buyers.
- Long-run increase around home-purchase, larger for younger buyers.

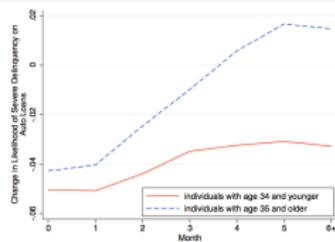
# Change in Delinquency Rate of Consumer Credits



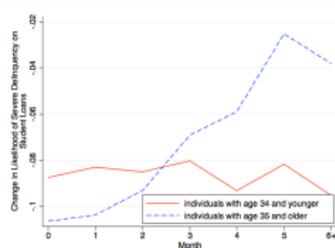
(d) Delinquency on Credit Cards  
(Obs = 93693, Joint test of diff: P-value = 0.0337)

## Change in Delinquency Rate of Consumer Credits

Delinquency rates increase after home purchases for both groups, even more for older buyers.

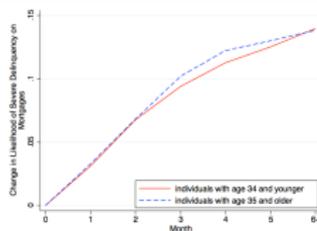


(a) Delinquency on Auto Loans  
(Obs = 68081, Joint test of diff: P-value = 0.0001)

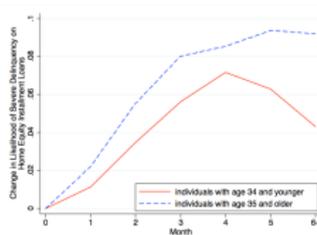


(b) Delinquency on Student Loans  
(Obs = 24931, Joint test of diff: P-value = 0.0762)

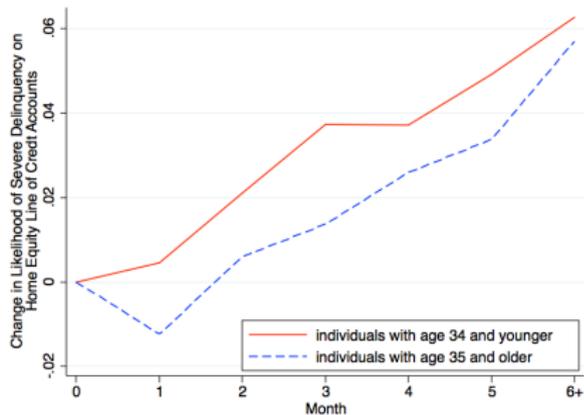
# Pattern in Delinquency Rate of Home-Equity Based Borrowing



(a) Delinquency on Mortgages  
(Obs = 15839, Joint test of diff:  
P-value = 0.5668)



(b) Delinquency on Home  
Equity Installment Loans  
(Obs = 3668, Joint test of diff:  
P-value = 0.7426)



(c) Delinquency on Home Equity Line of Credit Accounts  
(Obs = 3179, Joint test of diff: P-value = 0.5249)

## Pattern in Delinquency on HE Borrowing

Delinquency rates increase through years after home purchases, not significantly different between two groups.

# Conclusion

- Individuals prepone their first-home purchases when house price growth is higher.
  - In MSAs with highest quartile house price growth, the median individual become homeowners earlier by 5 years in their lifecycle compared to MSAs with lowest quartile house price growth.
- Younger buyers make more adjustments in their finances after the home purchase – taking out more debt/credit, and yet they do not appear to experience larger increase in delinquency than older buyers.

## Policy Implication

- We show that people pre pone the house purchase decisions in a market with higher house price growth. This paper could provide some insight for the Consumer Finance Protection Bureau (CFPB) on whether to help the young in the house buying decisions.
- We also find, after the home purchase, the delinquency rate for the young does not increase as much as, and sometimes even less than the other ages. The market charges the young higher prices, but as a policy decision we may want to consider not charging higher to young people based on credit reasons.