

Housing Booms and Shirking

Quanlin Gu, Jia He, and Wenlan Qian

Housing Booms

- Many parts of the world have experienced booming housing markets in the last two decades
 - US, China, Singapore, etc.
- Policy relevant implications
 - Financial stability of households and banking system
 - Real consequences on future economic growth
 - Previous literature mainly focuses on the channel of consumption and investment

A Less Explored Channel

- Housing booms also affect individual's labor market decisions
 - Educational choice
 - Labor market participation
 - **Effort**
- Loafing on the job is prevalent at work place
 - In 2014, 90% of American employees wasted time during work hours and close to 70% spent at least one hour unproductively every day (salary.com)
 - Cost employers hundreds of billions of dollars per year
- Research question:
 - *Do housing booms influence work effort?*
- Productivity and economic growth



Leisure and Effort Choice

- Trade-off
 - Reward to effort: (permanent) income \uparrow to afford higher consumption
 - Cost of effort: disutility (assuming strict preference for leisure)
- Housing booms alter effort incentives
 - The wealth channel: the “windfall” gain makes the reward to effort less appealing
 - Mostly for home owners/investors and wealthy individuals
 - The labor demand channel: “slack” labor market reduces the cost of shirking
 - Applicable for both homeowners and renters

Empirical Challenges

- Effort is hard to measure
 - Rarely studied
 - At best use survey answers or noisy proxies
 - Low frequency
- Identification challenge on house price movements

Our Setting

- Exploit China's large and persistent housing booms
- Novel measure of effort
 - Taking care of personal needs during work hours
 - Measured at the individual level
 - High frequency
- (Multiple) shocks of house price
 - Empirical analysis relies on within-individual change after the house price shock

Preview of Findings

- After positive shocks to house prices, the propensity to observe personal use of credit cards during work hours increased significantly (by 8%)
 - Only present in the treated areas
 - No such effect among retirees and unemployed in the treated areas
 - Prevalent in the treatment population
- Immediate and permanent effect
- Concentrated among homeowners, especially those with higher housing wealth
- Implications for labor productivity
 - No evidence of work hours switching
 - Stronger in early mornings and right before lunch
 - Stronger on later days of week
 - Stronger among workers with low work incentive

Data

- Credit card holder population of a leading bank
 - Over 22 million credit card accounts from by the end of 2012, constituting 10% of China's credit card market and covering all 32 provinces and municipalities in China
 - Individual-level monthly credit card statement information
 - Transaction-level data from 2008:01 to 2009:10: we observe the amount of transaction, location of transaction, **transaction type, date and time stamp of transaction**
- For a random sample of the card population, we obtain their demographics, e.g., age, gender, marital status, location, credit limit, ownership status, **occupation, employment status, employer type**, education, etc.

Analysis Sample

- Identify employed individuals
 - Excludes those in military service
 - Excludes supplementary card holders
 - Excludes unemployed and retiree population – falsification
- Focus on top 300 cities in the sample
- Keep active card user (CC activity for at least half of the sample period)
- Keep age between 22 and 80
- N= 202,778

Measuring Shirking

- Idea: to capture personal CC transactions made by employed individuals during work hours
- Credit card transactions on:
 - Spending on goods and services
 - Payment of financial services, government fees and utility bills (typically have to pay on-site)—over 30% of total transactions
- Top 5 CC transaction type in sample (>70%):

Frequency	Percent	Transaction Type
2,492,739	26.72	Onsite payment of financial services
2,219,610	23.79	Warehouse retailer
1,114,777	11.95	Department store
440,147	4.72	Fee payment
368,246	3.95	Restaurant

Measuring Shirking

- Work hour:
 - Mondays-Fridays: 9am-12pm, 2pm-5pm
 - Excludes weekends and public holidays
 - Excludes days individuals make CC transactions out of town
- Personal (non-work-related) transactions
- Main measure: dummy for non-work-related CC transactions during work hours
- Novelty: High frequency measure that detects distraction from work based on *actual* behavior
 - Does not capture all other shirking behavior such as personal phone call or social media
 - Does not account for other unobserved heterogeneity across individuals (e.g., work schedule)
 - Direct comparison of this measure across individuals is inappropriate
- Need exogenous variation in house price and study within-individual change

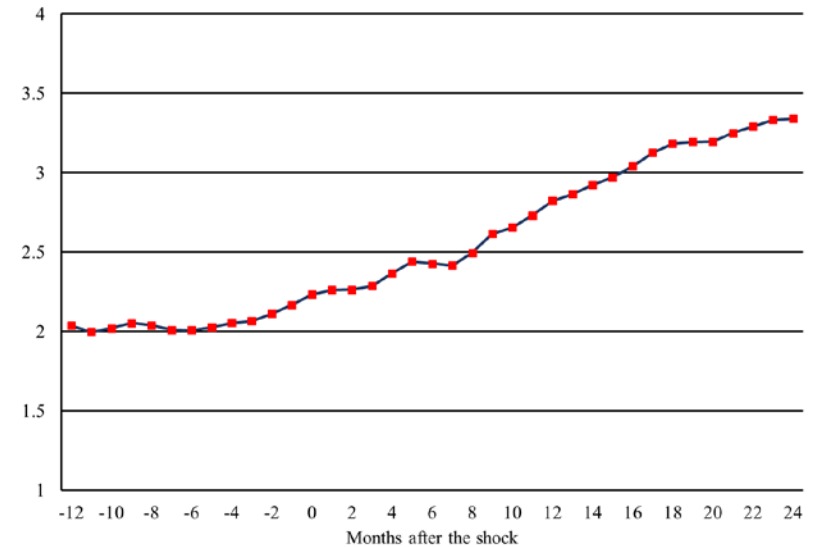
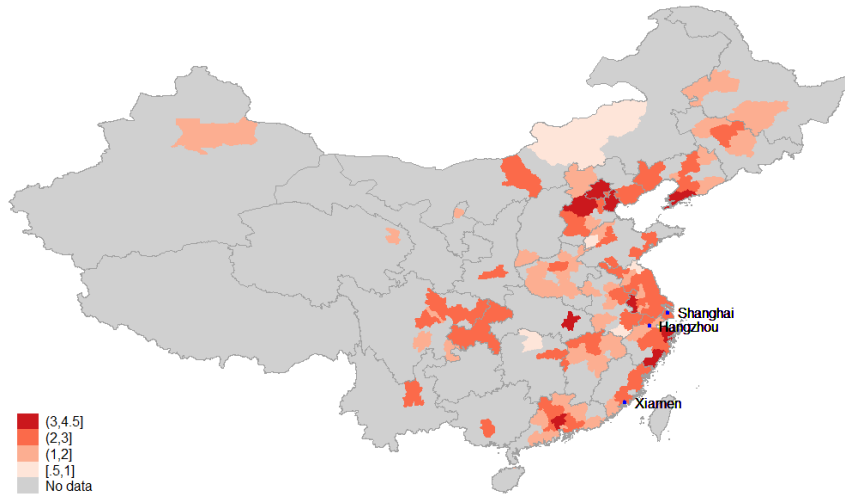
Shocks to House Price: “Land King”

- Land auctions:
 - Government owns land and holds open auctions to sell land
 - Record winning price—“Land King” (地王)
- Widely reported, salient events
 - Aggregates developer’s projection of future house prices
 - Viewed as a bullish signal of local house price
 - Covered in news media and update people’s prior
- Quite common in various Chinese cities since the late 1990s

Shocks to House Price: “Land King”

- Identifying assumption: Precise **timing** and precise **city** being awarded as “Land King” plausibly exogenous to individuals
 - Will explicitly test the parallel trends
- Three cities have nation-wide record high (unit) transaction price for residential land parcels in our sample period (Wu, Gyourko, and Deng, 2015)
 - Shanghai, August 27 2008
 - Hangzhou, August 18 2009
 - Xiamen, September 8 2009

Validity of the Land King Shocks



- Significant price increase after the Land King events
 - 5% per month
 - Similar results using DID
- No abnormal price change right before the shocks
 - Precise timing and city of Land Kings are unanticipated

Empirical Methodology

- Treatment: individuals in Shanghai, Hangzhou, and Xiamen
- Control group: to estimate the counterfactual
 - All others who are matched on observables – main analysis
 - All others in the sample
 - All others in the adjacent provinces: Jiangsu, Zhejiang, Fujian, Guangdong

- Our empirical model is as follows

$$Y_{i,t} = \delta_t + \alpha_i + \beta_{post}D_{i,post} + \epsilon_{i,t}$$
$$Y_{i,t} = \delta_t + \alpha_i + \beta_{pre}D_{i,(-1m,-1m)} + \beta_{evt}D_{i,0m} + \beta D_{i,post} + \epsilon_{i,t}$$

- We control for individual fixed effects, (industry specific and employer type specific) year month fixed effects
- All standard errors are clustered at the city level (i.e., the shock level)

Average Response

	(1)	(2)	(3)	(4)
	Work-hour personal transactions dummy			
$1_{-1m,-1m}$			0.0047 (0.68)	0.0045 (0.65)
1_0			0.0049 (0.88)	0.0040 (0.73)
1_{post}	0.0170*** (3.35)	0.0175*** (3.53)	0.0181*** (3.11)	0.0186*** (3.28)
Individual FE	Y	Y	Y	Y
Year-month FE	Y	N	Y	N
Industry year-month FE	N	Y	N	Y
Employer type year-month FE	N	Y	N	Y

- F-test rejects the null that $1_{post} = 1_{-1m,-1m}$
- The increase is equivalent to **8%** of the treatment group's pre-shock mean (21.3%)

Driven by Local Economic Conditions?

- Falsification test
 - Focus on two adjacent provinces—Jiangsu and Zhejiang—during the one year period after the first shock (in Shanghai)
 - Control: other unaffected provinces

	(1)	(2)	(3)	(4)
	Work-hour personal transactions dummy			
<i>Jiangsu & Zhejiang</i> _{-1m,-1m}			0.0012 (0.24)	-0.0001 (-0.02)
<i>Jiangsu & Zhejiang</i> ₀			-0.0070 (-1.23)	-0.0059 (-1.01)
<i>Jiangsu & Zhejiang</i> _{post}	-0.0009 (-0.12)	-0.0002 (-0.03)	0.0003 (0.04)	0.0005 (0.07)

Reflect Trend in Credit Card Use?

- Treatment group could use credit card disproportionately more
 - Should see higher likelihood of using credit card, as opposed to other instrument
 - Should also see higher credit card activity outside work-hours

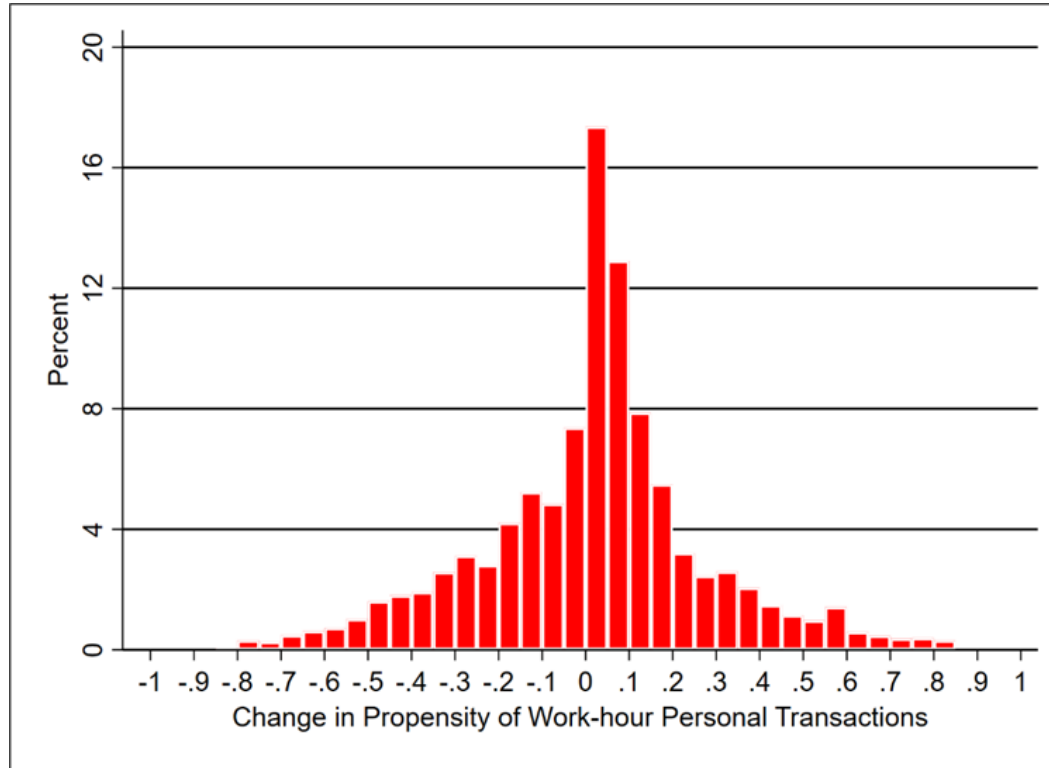
	(1)	(2)	(3)	(4)
	Credit card use dummy		Credit card transactions in non-work hours dummy	
$1_{-1m,-1m}$	0.0056 (0.80)	0.0062 (0.81)	-0.0034 (-1.45)	-0.0030 (-1.23)
1_0	0.0002 (0.02)	0.0010 (0.11)	-0.0034 (-1.43)	-0.0027 (-1.08)
1_{post}	-0.0025 (-0.80)	-0.0025 (-0.77)	-0.0077*** (-3.33)	-0.0076*** (-3.30)

Is This a Work Effort Response?

- Or behavioral changes in credit card use behavior (e.g., by spouse)
 - Falsification test: Response among retirees and unemployed:

	(1)	(2)	(3)	(4)
	Work-hour personal transactions dummy			
$1_{-1m,-1m}$			0.0359 (0.87)	0.0408 (0.90)
1_0			0.0066 (0.26)	0.0053 (0.20)
1_{post}	-0.0141 (-1.33)	-0.0129 (-1.18)	-0.0106 (-0.61)	-0.0091 (-0.49)

Distribution of the Response



- Mean (median) change = 1.6% (2.7%) ; pre-shock mean = 21.3%
- 60% treated with positive change
- Cannot be explained by people quitting their jobs (and consume leisure without shirking)
- Further alleviates change of credit card user story

The Wealth Channel

- The wealth channel: predicts the effort reduction effect to concentrate among home owners, especially those with higher housing wealth.
- Study the differential effect between non-home owners and home owners
- Study the heterogeneity within homeowners based on proxies of housing wealth

Owners vs. Renters

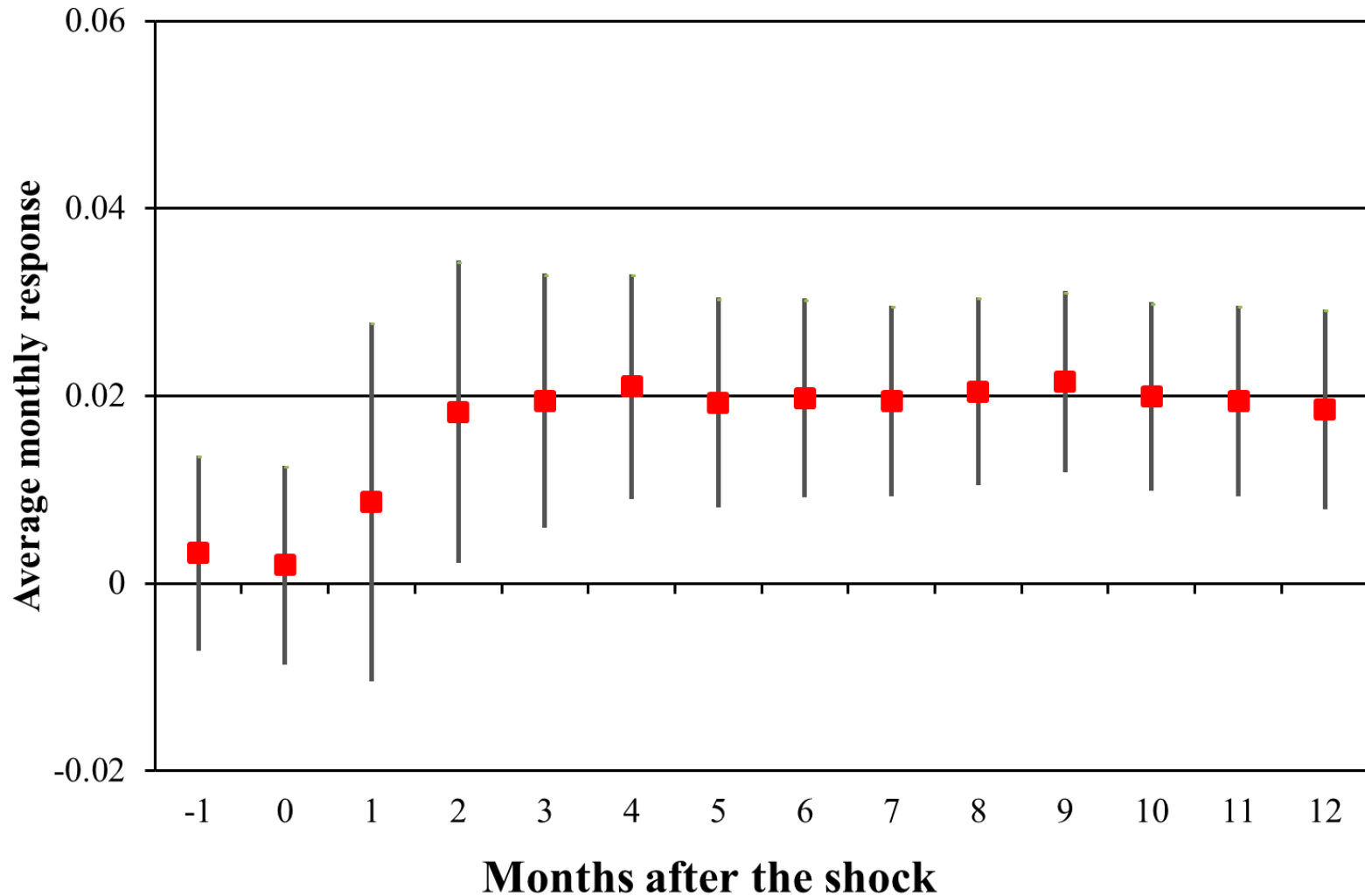
	(1)	(2)
	Work-hour personal transactions dummy	
1_{post}	0.0035 (0.75)	0.0045 (0.93)
$1_{\text{post}} \times \text{Own}$	0.0177*** (24.53)	0.0178*** (11.88)

	(1)	(2)	(3)	(4)
	Work-hour personal transactions dummy			
1_{post}	0.0114** (2.17)	0.0134** (2.34)	0.0199*** (3.53)	0.0215*** (3.66)
$1_{\text{post}} \times \text{High credit limit}$	0.0120*** (5.72)	0.0114*** (5.29)		
$1_{\text{post}} \times \text{Multiple homes}$			0.0381*** (5.15)	0.0388*** (4.66)

The Labor Demand Channel

- Labor market response reduces cost of shirking
 - Land Kings may lead to more employment opportunities
 - Firm response: invest in real estate and leaves less work for employees
- Less likely
 - should apply for both owners and renters
- These explanations also imply a lagged response
 - Firm and market response generally takes some time

Dynamic Response



Productivity Implication

- Maybe people change their work hours
 - Implies reduction of credit card use in other hours (8-9am, 12-2pm, 5-9pm)
 - We find no evidence of changing work hours
- Moreover, the intensity of using work hours to take care of personal matters is stronger
 - In the early morning hours
 - Near lunch
 - During the later days of the work week

Becoming More Efficient?

- Achieve more in shorter hours of work
- Attending to personal matters does not hurt productivity
 - If we observe a stronger effect among workers with greater reward to effort
- Proxy of work incentives
 - Older, near retirement employees: Option value of effort is small
 - Especially among SOE employees
- Finding: **stronger effect among older employees, particularly when they work at SOE**

Additional Analysis

- Alternative pre-trend windows
- Alternative control group
 - Geographically proximate provinces—Jiangsu, Zhejiang, Fujian, Guangdong
 - Full sample analysis
- Alternative shirking measure
 - Stricter def. of non-work-related transaction
 - Use work-hour spending on retailer, department store, movies/theatre and spa
 - # of non-work-related personal transactions
- Results are very similar

Concluding Remarks

- The first paper to study the (real) impact of housing booms on work effort
 - Novel measure of effort at high frequency
- Significant increase in shirking after positive shocks to house prices
- Effect concentrated among homeowners
- New insight on the real impact of housing booms through the labor productivity channel
 - Our results imply an elasticity of work-hour shirking propensity with respect to house prices of 1.6
 - Input for housing (price) regulation